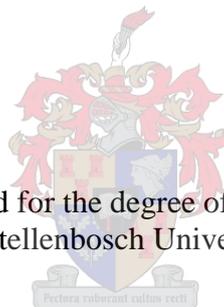


**AN EMPIRICAL STUDY OF SOUTH AFRICAN BUSINESS FORECASTING
PRACTICES IN THE CONTEXT OF WESTERN BENCHMARKS**

By

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at Stellenbosch University



Promoter: Professor E. vd M Smit

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Declaration

By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

Effective and productive forecasting management has evolved from a tactical to a strategic weapon for firms attempting to stay ahead of adverse economic, industry and market environments. With the advent of increased domestic and global competition this evolution has become more widespread and acute. Firms leveraging their forecasting management skills into their profit statements are indeed staying one step ahead of their competitors while those failing in this management discipline are falling behind their competitors both on tactical and strategic levels.

Naturally following these events numerous issues and questions are raised. Where do firms, both from a national and international perspective, rate in terms of forecasting management competency and effectiveness? Do the forecasting practices of a particular firm lead the pack, lag the pack or just go along with the pack or does the firm deserve the moniker of ‘best in class’, ‘world class’ or ‘the best of the best’?

This study attempts to answer these questions for South African firms in the context of ‘Western’ standards or benchmarks. The ‘Western’ benchmarks reflect forecasting management standards of certain firms primarily domiciled in the United States, Europe, Canada and Mexico although most are multinational, operating globally. The study utilises a qualitative multi-method approach. An ethnographic ‘*Long Interview*’ strategy is used to obtain, *in situ*, face to face practice evidence from 30 respondents holding high level forecasting positions at 20 South African firms. The interview evidence is triangulated with other sources of evidence harvested from the application of a qualitative case study research strategy. The combined evidence is analysed through the application of the grounded theory techniques of categorical saturation and informational redundancy.

Results of the application of the multi-method strategies reveal the forecasting practices of RSA firms are highly factionalised and tribalised and the verdicts as to whether or not these firms meet or fall short of ‘Western’ benchmarks is dependent upon their faction and tribal affiliation. Some factions and tribes within a faction meet the benchmarks in certain aspects of the practice but fall short in others and display practice disorders. Some factions fall short in general and are generally disordered. The cumulative effect of certain shortcomings in the practice of all factions and tribes rendered the current forecasting processes of these firms strategically and tactically flawed. The study conclusions and recommendations are grounded in the evidence uncovered and analysis findings and are transferable or naturalistically generalised to all South African firms.

On a broader scale this study offers the science and *any* firm engaged in business forecasting activity an inventory of contemporary benchmarks and an operationalised forecasting process that can be tested, transferred or naturalistically generalised to their respective settings.

Opsomming

Effektiewe en produktiewe vooruitskattingsbestuur het 'n evolusie ondergaan van 'n taktiese na 'n strategiese wapen vir ondernemings wat poog om voor te bly in moeilike ekonomiese-, industrie- en markomgewings. Hierdie evolusie het meer verspreid en akuut geword namate die plaaslike en globale mededinging verskerp het. Ondernemings wat hul vooruitskattingsvaardighede benut tot in hul inkomstestate, bly een tree voor hul mededingers, terwyl diegene wat hierdie bestuursdisipline verwaarloos, agter raak op beide die taktiese en strategiese vlakke.

Natuurlik laat hierdie verskynsel vrae ontstaan oor verskillende aangeleenthede. Hoe word ondernemings beoordeel, beide uit 'n plaaslike as 'n internasionale perspektief, in terme van vooruitskattingsbestuur vermoëns en effektiwiteit? Sal die vooruitskattingspraktyke van 'n spesifieke onderneming die groter groep lei, daarmee saamval of volg en verdien die organisasie die titel van “beste in sy klas”, “wereldklas” of “beste van die beste”?

Hierdie studie poog om hierdie vrae te beantwoord vir Suid-Afrikaanse ondernemings binne die konteks van “westerse” standaarde of norme. Die “westerse” standaarde reflekteer vooruitskattingsbestuur standaarde in bepaalde ondernemings met tuistes hoofsaaklik in die Verenigde State van Amerika, Europa, Kanada en Mexiko, alhoewel die meerderheid 'n internasionale aard het en globaal opereer. Die studie maak gebruik van 'n kwalitatiewe veelvuldige metode benadering. “n Etnografiese “Diepte Onderhoud” strategie word gebruik om, in situ, een tot een getuies in te win oor vooruitskattingspraktyk in Suid-Afrikaanse ondernemings van 30 respondente wat sleutelposisies in vooruitskattings beklee. Hierdie onderhoude word deur triangulasie vergelyk met ander inligtingsbronne wat by wyse van 'n kwalitatiewe gevallestudie ingesamel is. Die gekombineerde inligting word ontleed deur die toepassing van gefundeerde teoretiese tegnieke van kategorieerse versadiging en inligting oorbodigheid.

Die resultate van die toepassing van die veelvuldige metode benadering dui daarop dat vooruitskattingspraktyke in Suid-Afrika hoogs divers is en dat gevolgtrekkings rakende die vergelyking met westerse norme hoogs afhanklik is van die groep of sub-groep affiliasie. Sommige groepe en sub-groepe voldoen aan die norme ten opsigte van bepaalde aspekte, maar skiet tekort in andere en vertoon dus praktykvariasie. Sommige groepe skiet in die algemeen te kort en vertoon onstabiel. Die gevolgtrekkings van die studie is gebaseer op die ontleding van die gegewens en kan veralgemeen word tot die universon van Suid-Afrikaanse ondernemings.

Die studie bied aan elke onderneming wat sakevooruitskattings bedryf, opsommings van hedendaagse norme en 'n geoperasionaliseerde vooruitskattingsproses wat toetsbaar, oordraagbaar en natuurlikerwys veralgemeenbaar is binne hul onderskeie omgewings.

Acknowledgement

Works of this nature are rewarding. They are also costly. One of the largest costs are the opportunity costs of hours, days, months and quarters forgone with family and especially those precious family members who are undeserving of being deprived of many days, months and years. To one such member whose deprivation has come at a young age in the form of Osteosarcoma, my apology, gratitude and acknowledgement is hereby extended. My apology for the untold time spent at keyboards and libraries rather than at your side, my gratitude for honouring your commitment to prevail to see the conclusion of this work and my acknowledgment that had you not, this work would not have seen the light of day. Long may you run now and hereafter.

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Glossary

ABC Analysis

Analysis of a range of items which have different levels of significance and should be handled or controlled differently. It is a form of Pareto analysis in which the items (such as activities, customers, documents, inventory items, sales territories) are grouped into three categories (A, B, and C) in order of their estimated importance. 'A' items are very important, 'B' items are important, 'C' items are marginally important.

Benchmarking

The continuous process of measuring products, services and practices against leaders, allowing the identification of best practices that will lead to measurable improvements in performance (Camp, 1989).

Black Swan

The theory was described by Nassim Nicholas Taleb in his 2007 book *The Black Swan*. He defines a 'black swan' as an event that is unpredictable (nothing in the past can point to its possibility, has extreme impact (both positive and negative) and is subject to human retrospective 'explainability'. Taleb regards many scientific discoveries as black swans—"undirected" and unpredicted. He gives the rise of the Internet, the personal computer, the First World War, as well as the September 11, 2001 attacks as examples of Black Swan events.

Black Box

Black box is a technical term for a device or system or object when it is viewed primarily in terms of its input and output characteristics. In the context of forecasting, black box forecasting refers to a process whereby data is fed into a computer system and numbers (forecasts) are returned without any human intervention.

Bottom-Up

Under the concept of Bottom-Up forecasting, individual components are forecasted separately and then added together to obtain the forecast for the aggregated group.

Catch-22

A situation in which a desired outcome or solution is impossible to attain because of a set of inherently illogical rules or conditions. Common examples include a closed repertoire Catch-22 where only music that is already familiar is thought to deserve familiarity or US tax Form 4868 Catch-22 whereby the taxpayer is instructed to include a check if any additional tax is owed, otherwise the taxpayer faces additional penalties.

Categorical Saturation

Under the qualitative paradigm (case studies, grounded studies and ethnographic investigations) categorical saturation is the point reached by an investigator where no further evidence gathering is necessary to establish the patterns or definitions of an analytic or cultural category. In grounded studies categories may also be theories in which case the point of conclusion reached is referred to as Theoretical Saturation. Saturation and redundancy are often used interchangeably. In the present study these two descriptions refer to two distinct events. See **Informational Redundancy**.

Collaborative Planning, Forecasting and Replenishment (CPFR)

Collaborative Planning, Forecasting, and Replenishment (CPFR) is the sharing of forecast and related business information among business partners in the supply chain to enable automatic product replenishment.

Conjoint Analysis

Conjoint analysis is one of many techniques for dealing with situations in which a decision maker has to choose among options that simultaneously vary among two or more variables. The problem facing the decision maker is how to trade off the possibility that option X is better than option Y on attribute A but worse than option Y on attribute B, and so on.

Dantotsu

A Japanese word roughly translating as the “*very best of the best*” emblematic of a degree of performance achieved in a business practice that is exceptional or unique.

Deconstruction

A process of critical evaluation or quality control. In the context of the ‘Long Interview’ protocol this process evaluates extant literature of analytic categories.

Deep Understanding

Understanding a topic, analytic or cultural category in a systematic, integrated or holistic way.

Discours de la Méthode

A critical approach advocated by philosopher René Descartes which ascribes four precepts: "The first was never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgment than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt. The second, to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution. The third, to conduct my thoughts in such order

that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex; assigning in thought a certain order even to those objects which in their own nature do not stand in a relation of antecedence and sequence. And the last, in every case to make enumerations so complete, and reviews so general, that I might be assured that nothing was omitted."

DRP (Distribution Requirement Planning)

Systematic process for determining which goods, in what quantity, at which location, and when they are required in meeting anticipated demand. This inventory related information is then entered into a manufacturing requirements planning (MRP) system as gross requirements for estimating input flows and production schedules.

EDI (Electronic Data Interchange)

The electronic communication of business transactions, such as orders, confirmations and invoices, between organizations. Third parties provide EDI services that enable organizations with different equipment to connect. Although interactive access may be a part of it, EDI implies direct computer-to-computer transactions into vendors' databases and ordering systems.

Emic

An emic account is a description of behaviour or a belief in terms meaningful (consciously or unconsciously) to the actor. **See Etic.**

ERP (Enterprise Resource Planning)

Enterprise resource planning (ERP) is the planning of how business resources (materials, employees, customers etc.) are acquired and moved from one physical location to another. An ERP system supports most of the business system that maintains in a single database the data needed for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management

Etic

An etic account is a description of behaviour or a belief in terms meaningful (consciously or unconsciously) to the observer. **See Emic.**

Ethnographic

The branch of anthropology that deals with the scientific description of specific human cultures. Ethnography is a genre of writing that uses fieldwork to provide a descriptive study of human societies. Ethnography presents the results of a holistic research method founded on the idea that a system's properties cannot necessarily be accurately understood independently of each other.

Ex Ante

Latin for 'before the event'. In economics and business refers to expectations before the event, based upon forecast. **See Ex Post.**

Ex Post or Ex Post Facto

Latin for 'after the fact or event'. In economics and business refers to recordings or measurements of actual outcomes. **See Ex Ante.**

External Validity

External validity is the degree to which the conclusions in a study would hold for other persons in other places and at other times.

Grounded Theory

Is a systematic qualitative research methodology in the social sciences emphasizing generation of theory from data in the process of conducting research. It is a research method that operates almost in a reverse fashion to traditional research and at first may appear to be in contradiction of the scientific method. Rather than beginning by researching and developing a hypothesis, a variety of data collection methods are the first step. From the data collected from this first step, the key points are marked with a series of codes, which are extracted from the text. The codes are grouped into similar concepts, in order to make them more workable. From these concepts categories are formed, which are the basis for the creation of a theory, or a reverse engineered hypothesis. This contradicts the traditional model of research, where the researcher chooses a theoretical framework, and only then applies this model to the studied phenomenon. It was developed by two sociologists, Barney Glaser and Anselm Strauss.

High Velocity

Refers to an operating environment where there is rapid and discontinuous change in demand, competitors, technology or regulation so that information is often inaccurate, unavailable or obsolete. **See Low Velocity.**

Holistic Framework

A holistic framework argues that a more thorough knowledge and understanding of a system can be gained from combining different measures than can be derived than taking those measures separately.

In Camera

A Latin term for 'behind closed doors'. Business conducted in private.

Ipsa facto

A Latin term, directly translated as “by the fact itself”, which means that a certain effect is a direct consequence of the action in question, instead of being brought about by a subsequent action such as the verdict of a tribunal. It is a term used in philosophy, law and science.

Informational Redundancy

Refers to the point reached in the qualitative paradigm (case studies, grounded studies and ethnographic investigations) where additional information received from respondent after respondent does not materially alter the pattern or the definition of an analytic or cultural category. The information has the quality of being essentially the same data expressed in different ways but does not sway or vary from the theme or established pattern of a category and thus becomes redundant. See **Categorical saturation**.

Islands of Analysis

Islands of analysis are distinct areas within a firm that perform similar functions. Each area maintains a separate process, thereby performing redundant tasks and often having the same responsibilities. Because islands of analysis are often supported by independent computer systems (which often are not electronically linked to other systems within the firm), information contained within the different islands is not shared between departments.

JDA e3 software

Advanced Store Replenishment software offered by JDA Software Group to address the basic and advanced functions within the context of demand forecasting, replenishment and Collaborative Planning Forecasting and Replenishment (CPFR).

Low Velocity

Refers to an operating environment where there is very little market or industry dynamism characterised by modest to slow change in demand, competitors, technology or regulation so that information is stable, available and current.. **See High Velocity**

Master Production Schedule

A Master Production Schedule (MPS) is a manufacturing plan that quantifies significant processes, parts, and other resources in order to optimize production, to identify bottlenecks, and to anticipate needs and completed goods.

MIS (IT/Decision Science)

Short for management information system or management information services, and pronounced as separate letters, MIS refers broadly to a computer-based system that provides managers with the tools for organizing, evaluating and efficiently running their departments. In order to provide past, present and prediction information, a MIS can include software that helps in decision making, data

resources such as databases, the hardware resources of a system, decision support systems, people management and project management applications, and any computerized processes that enable the department to run efficiently. Within companies and large organizations, the department responsible for computer systems is sometimes called the MIS department. Other names for MIS include IS (Information Services) and IT (Information Technology).

MPS (Master Production Scheduling)

A routine that translates a business plan into comprehensive product manufacturing schedules that covers what is to be assembled or made, when, with what materials acquired when, and the cash required. MPS is a key component of material requirements planning (MRP).

MRP (Material Requirements Planning)

An information system that determines what assemblies must be built and what materials must be procured in order to build a unit of equipment by a certain date. It queries the bill of materials and inventory databases to derive the necessary elements.

PERT

The Program (or Project) Evaluation and Review Technique, is a model for project management designed to analyze and represent the tasks involved in completing a given project. PERT was developed primarily to simplify the planning and scheduling of large and complex projects.

POS

Point Of Sale. The physical location at which goods are sold to customers A point-of-sale (POS) terminal is a computerized scanning device and is a replacement for a cash register. Much more complex than the cash registers of old, the POS system can include the ability to record and track customer orders, process credit and debit cards, connect to other systems in a network, and manage inventory.

Prima facie Evidence

Prima facie is a Latin expression meaning "on its first appearance", or "by first instance". It is used in modern legal English to signify that on first examination, a matter appears to be self-evident from the facts.

Primum Non Nocere

The Latin phrase that means "First, do no harm."

Product Life Cycle

A new product progresses through a sequence of stages from introduction to growth, maturity and decline. This sequence is known as the product life cycle and is associated with changes in the marketing situation, thus impacting the marketing strategy and the marketing mix.

Qualitative Comparative Analysis (QCA)

Qualitative Comparative Analysis (QCA) is an analytic technique that uses Boolean algebra to implement principles of comparison used by scholars engaged in the qualitative study of macro social phenomena.

S&OP (Sales and Operations Planning)

The Sales and Operations Plan (S&OP; sometimes also called Sales, Inventory and Operations Plan or SIOP) is a managerial tool used for manufacturing planning and control. Its fundamental objective is to reconcile sales forecasts with production plans in terms of volume. To do so, the S&OP has to coordinate planning efforts among the various departments involved in the process.

Sagacity

The quality of being discerning, sound in judgment, farsighted and wise.

Sales Force Composites

A method of developing a sales forecast that uses the opinions of each member of the field sales staff regarding how much the individual expects to sell in the period as input.

SAP APO demand planning tools

SAP stands for Systems, Applications and Products in Data Processing. It is a software firm founded by five German Engineers in 1972. SAP software products have several modules each of which address a business process. The Demand Planning (DP) component of SAP Advanced Planner and Optimizer (SAP APO) is a complex, high-performance, and flexible instrument that supports the sales requirements planning process. SAP Strategic Enterprise Management (**SAP SEM**) delivers end-to-end capabilities to support the entire performance management life cycle, including consolidated financial reporting and budgeting.

SKU

Stands for stock keeping unit and is a unique identifier for each distinct product and service that can be ordered from a firm. Usage of the SKU system is rooted in data management, enabling a merchant or manufacturer to systematically track their inventory/stocks in warehouses and retail outlets.

Supply Chain

A supply chain or logistics network is the system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer.

SWOT

SWOT Analysis is a strategic planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favourable and unfavourable to achieving that objective.

Symptoms of Truth

Qualitative evidence must exhibit the following symptoms:

1. It must be exact, so that no unnecessary ambiguity exists.
2. It must be economical, so that it forces the minimum number of assumptions.
3. It must be mutually consistent, so that no assertion contradicts another.
4. It must be externally consistent, so that it conforms to what is independently known about the subject matter.
5. It must be unified, so that assertions are organized in a manner that subsumes the specific within the general, unifying where possible, discriminating when necessary.
6. It must be powerful, so that it explains as much of the data as possible without sacrificing accuracy.
7. It must be fertile, so that it suggests new ideas, opportunities for insight.

Theoretical Sampling

Theoretical sampling is a term coined by Barney Glaser and Anselm Strauss in 1967 in the context of social research to describe the process of choosing new research sites or research cases to compare with one that has already been studied. Theoretical sampling can be viewed as a technique of data triangulation using independent pieces of information to get a better definition or understanding of a theory or category that is only partially understood.

Triangulation

Triangulation is an approach to evidence analysis that synthesizes data from multiple sources. By examining evidence collected by different methods from different sources, findings can be corroborated across data sets, reducing the impact of potential biases that can exist in a single study.

Two-Bin

Is an stock/inventory control method used usually for small or low value items. When the first bin is used up, an order is created for replenishment. The second bin, in theory, should contain enough quantity of the item to last until the ordered quantity arrives.

Vox Clamantis in Deserto

Latin expression meaning 'the voice of one crying in the wilderness'.

Behold, for seven years there is coming great plenty in all the land of Egypt. But there shall come seven years of famine after these, and they shall forget the plenty that shall be in all Egypt, and the famine shall consume the land.
(Genesis 41: 29 - 30)

1.1 The Evolution and Growth of Forecasting Management

The art, form and function of the human action of forecasting dates back to time immemorial. It has been practiced by different types of individuals (witches, oracles, astrologers) in different forms (star counting, bone throwing, entrails reading) for different purposes (medical, political and commercial). The practice has been both formal and informal. The Old Testament records the forecasting practices of the prophet Joseph. Firstly, he gathered input and data from Pharaoh and others, analysed and interpreted the data (Pharaoh's dreams) and effectively generated a long term (seven year) macroeconomic forecast (Genesis, **41**: 29-30). Secondly, he counselled Pharaoh to make production and logistical decisions based upon his forecast. This was to appoint local governors all over the land and have one fifth of all rural corn production during the forecasted seven year boom period moved into urban storage to build up stocks for the forecasted famine years (Genesis, **41**: 34-35). Finally, the clarity of Joseph's analysis, forecast presentation and wisdom of his recommendations resulted in his promotion to Egypt's Minister of Finance (Keeper of the Royal Seal). His forecasts subsequently were reported to be accurate (Genesis, **41**: 42-48).

In contrast to biblical prophets and the *ad hoc* forecasters of old who relied on divine endowment and artistic practices, today's professional forecasters are turning more and more to science, technology, organization, education and capital to take the art, risk and disrepute out of their profession. Thirty years ago titles of 'Forecasting Manager' or even 'Forecasting Department' were an anathema with operational forecasting activity being quietly and implicitly conducted in marketing, sales, finance and manufacturing departments, if at all. Legacy Univac 1100 or IBM 360 Mainframes running Fortran or COBOL language software of exponential smoothing and moving averages routines were the *de facto* 'forecasting departments' of large Western corporations. This has continued to rapidly change as not only are formal forecasting departments being formed with managers or directors at their head, but forecasting organisations headed by vice presidents are growing. Exhibit 1.1 provides hard data testimony to this evolution by providing a time series representation of median annual salaries paid to a sample of US company executives holding the title of 'Vice President of Forecasting' (Jain, 2001-2007, 2006b). The data are compiled from annual surveys conducted by the US based Institute of Business Forecasting (IBF), a practitioner educational and research centre. Annual median salaries of a sample of 'Vice Presidents of Forecasting' were US\$129,000 in 2000 and rose to US\$158,000 in 2007:

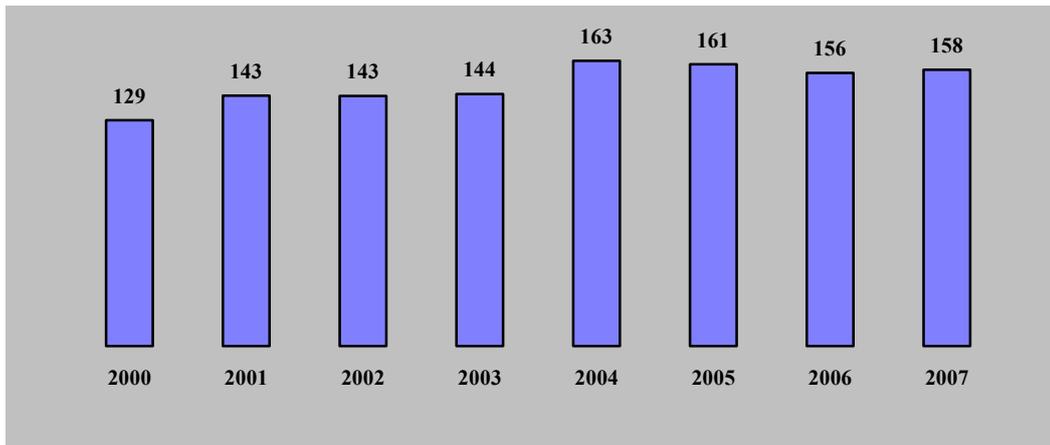


Exhibit 1.1: IBF Surveys of Annual Median Salaries of Vice Presidents of Forecasting (Salaries are Measured in US\$,000)

On a US rate of inflation adjusted basis salaries for 2005, 2006 and 2007 were \$155,000, \$151,000 and \$153,000, respectively. Vice Presidents of Forecasting over the three year period in question have been valued at over \$150,000 in real terms. The same surveys report a marked increase in the number of forecasting professionals being hired by US firms at all levels. Historically, the firm's forecasting headcount, if there was one, was indeed one and that person was usually the 'Corporate Economist' whose output was macroeconomic forecasting for corporate policy and long term capitalization planning. This was particularly prevalent amongst the ranks of the large US based airlines, oil firms and aircraft manufacturers. Large investment institutions and commercial banks were the other homes to the one to two person forecasting 'shop' run by an Economist and the bread and butter forecast deliverable was short term interest rates. Demand for these types of forecasters still exist, but with greater emphasis being placed on operational efficiencies and market and global competitiveness, the demand for more mundane forecast deliverables (such as product volume, market demand, sales supply and cash flow), has increased dramatically. Consequently, it is no surprise the latest (2007) IBF survey conducted show the average number of 'forecasters' employed by the firms they sampled is just under five and has been on the upswing since 2005 (Jain, 2001-2007, 2006b). The results of the surveys of this variable from 2000 to 2007 are shown in Exhibit 1.2.

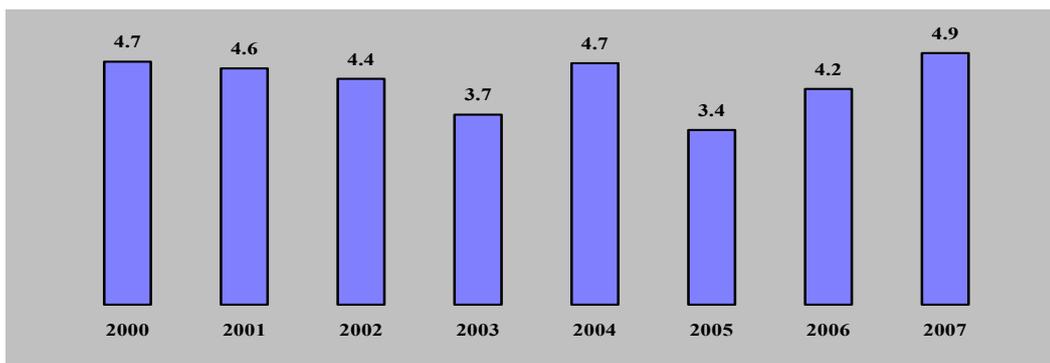


Exhibit 1.2: Average Number of Forecasters Employed at a Sample of Western Firms

1.2 Raison d'être

Unfortunately, evolution and growth do not necessarily ensure quality and performance. As with any management discipline there are good managers and poor managers and there are good management practices and decisions and poor management practices and decisions. Forecasting management and its associated practices are no exception. With this in mind how does one recognise, measure, evaluate and distinguish good forecasting management practices from poor ones? Does one use the metric of forecast accuracy as the quality or performance criteria? If so, what conclusion does one come to when the firm's forecaster continues to attain a 5% sales forecast accuracy level while the firm only satisfies 85% of its customer demand? Alternatively, what is the judgment when the firm's forecaster does in fact predict customer demand accurately but the firm continues to only satisfy 85% of its customer demand? Conversely, what is the verdict when the forecaster accurately predicts both sales and demand but the firm's stock/inventory turns are less than one? Is the verdict the same when stocks/inventories are high due to actual production exceeding forecasted supply and demand to recover factory fixed cost overhead? Regrettably, the events above are not hypothetical, but recorded and most often in prestigious business publications. To wit, The Wall Street Journal headlines: *"Intel Concedes It Made Too Many 80386 Chips, Sees Growth Stalling"* with quotes from the likes of Gordon Moore (Intel's then Chairman), *"We clearly overshot our forecasts"* and Merrill Lynch & Co. Equity analyst Thomas Kubiak, *"It looks like every dollar of sales that Intel won't make is a dollar of lost profit, that hurts. This just shows how poorly they can forecast"* (Schlender, 1998). Herein lies a forecasting problem and disorder.

Next, does one adjudicate using state of the art forecasting techniques, software, systems and hardware technology as a good forecasting management practice? After all, the *Journal of Forecasting* (JoF) and the *International Journal of Forecasting* (IJF) are full of research documenting successful new formulae and case studies from academic forecasting laboratories. Moreover, IDC, the US based global market intelligence firm, estimated 2002 global sales of demand forecasting software and supply chain solutions amounted to US\$19 billion (Worthen, 2003). Surely this 'systems' approach is the way to go as firms like Oracle Corporation and Sap AG Systeme are success and performance stories in their own rights systematising anything they can lay their hands on? Before answering this question, a pause and consideration of the historical data, as any professional forecaster would, is in order. Consider the forecasting management practices of Nike Inc., whose 2001 global sales of sporting footwear, apparel and equipment totalled US\$9.5 billion (Nike, Inc., 2005). *"Nike went live with its much-vaunted i2 system in June 2000, and nine months later, its executives acknowledged that they would be taking a major inventory write-off because the forecasts from the automated system had been so inaccurate. With that announcement in February 2001, Nike's stock value plummeted, along with its reputation as an innovative user of technology. But what has since trickled out in court documents from shareholder lawsuits may be even more disturbing because it shines a harsh light on the inherent limitations of demand forecasting software. According to the documents, i2's supposedly state-of-the-art forecasting system couldn't*

communicate with Nike's existing systems, which impaired its ability to analyze large amounts of product information. At some point, the data even had to be entered in by hand, greatly increasing the chance for mistakes. And the forecasts themselves were way off. Relying exclusively on the automated projections, Nike ended up ordering \$90 million worth of shoes, such as the Air Garnett II, that turned out to be very poor sellers. The company also came up with an \$80 million to \$100 million shortfall on popular models, such as the Air Force One” (Worthen, 2003). Indeed, Nike’s reputation as an innovative user of technology plummeted, but they are not the only company to have had such an experience. Marquee names such as Goodyear Tire and Rubber Company and Cisco Systems Incorporated have also found out the hard way that technology on its own is no match for the challenges presented by today’s global and market driven business environments (Worthen, 2003). With these expensive and hard learned lessons being documented again and again, one may argue that forecasting practices that rely heavily on technology or on technology alone (such as ‘black-box’ forecasting systems) are, at a minimum, deficient and or disordered.

It should be noted that these unfolding events documented in the international business media are not restricted to the billion dollar corporations but permeate all layers of corporate size and type and play out in Western court rooms day after day. To wit, Applica Incorporated, a US\$500 million Miami, Florida based manufacturer and distributor of household (primarily Black & Decker brand) and personal products was a February 2006 defendant in the United States District Court for the Southern District of Florida. *“The complaint alleges defendants violated federal securities laws by issuing a series of materially false statements regarding Applica's financial condition. Specifically, defendants failed to disclose that: (i) Applica was experiencing decreasing demand for its products, particularly Tide(tm) Buzz(tm) Ultrasonic Stain Remover and Home Cafe(tm) single cup coffee maker, which were not meeting internal expectations; (ii) Applica was materially overstating its net worth by failing to timely write down the value of its inventory which had become obsolete and unsaleable; (iii) Applica was experiencing higher product warranty returns, which it had not appropriately reserved for; and (iv) Applica's financial statements issued during the Class Period were not prepared in accordance with Generally Accepted Accounting Principles ("GAAP") and therefore were materially false and misleading. The complaint further alleges that, on April 20, 2005, defendants revealed that the Company would not come near achieving the guidance they had previously sponsored and/or endorsed, that Applica's business was suffering from numerous adverse factors and that the Company was marking down inventory and experiencing increased warranty expenses. Then, on April 28, 2005, defendants further detailed the impact of these adverse factors on Applica's business. These belated disclosures had an immediate, adverse impact on the price of Applica shares” (Coughlin et al., 2006; MarketWatch, 2006). The firm’s share quote on the New York stock exchange was US\$14 in April, 2004 and US\$1.44 on February 8, 2006.*

What emerges quite clearly from analysing the skeletons and successes of attempts at effective and quality driven forecasting management is the multidimensional nature of the practice. Once one recognises and understands the required skill, organisation, education, technology, intelligence and

capital requirements both in terms of quality and quantity, one is better equipped to deal with the required design engineering/reengineering and execution of successful forecasting management. This study therefore has two aims. The first is to assess the current standing of RSA business forecasting practices in the context of ‘Western’ standards or benchmarks and then to guide and assist RSA and Western firms in the recognition, understanding and implementation of quality and performance driven forecasting practices and processes.

The intended practical end product or contribution of this study is directed towards both local and Western forecasting practitioners and researchers. The practical end product for local and Western practitioners is a forecasting management roadmap showing where they are currently positioned on the map, where their domestic and Western peers and competitors are located, the shortfalls between each and the distances the former needs to travel to close those shortfalls, if and where they exist.

The intended contribution to forecasting management research is a South African response to the numerous Western challenges and invitations from eminent researchers in the field such as Scott Armstrong of the Wharton School and Robert Fildes of the International Institute of Forecasters for more research and data points to be provided in the ongoing understanding and refinement of forecasting management science (Armstrong, 1987a,b; Fildes & Hastings, 1994). In turn it is hoped the contribution will at a minimum motivate local forecasting researchers to transfer the methods used in this study and replicate or validate the results by investigating practices at other local firms. The last published study by local researchers addressing this topic using different methods occurred twenty years ago. At the same time the research contribution is also aimed in the direction of Western researchers. The forecasting research methods developed and used in this study together with the results and recommended roadmap and process are presented and packaged in a way for the approach to be replicated, tested and transferred to any Western forecasting setting. As will be discussed at length and in detail later in the study, this approach is termed ‘Naturalistic Generalisation’.

If the contribution of this study in either the practice or research setting is able, at a minimum, to prevent or mitigate, locally or in the West, future US\$400 million resource wastages associated with the author’s profession, the attempt will have been worth the effort, ... a forecaster’s *raison d’être*.

1.3 Schema of the Study

This study is presented in 6 chapters. This chapter is the study introduction, overview of the research strategies/methods to be applied and a description of the different types of evidence to be gathered, used and analysed. Chapter 2 will review the analytic categories of forecasting practices

via a comprehensive academic and applied literature search. Chapter 3 will continue the literature review but in the vein of critical 'deconstruction' rather than placid acceptance. Chapter 4 will review the cultural categories associated with the practice to assist in the construction of an interview plan and the development of a final list of 'Western' benchmarks. These benchmarks will be used in the interviews of 30 high level manager respondents from 20 anonymous South African firms. The results of the interviews will be summarised and analysed in Chapter 5 and the research methods used will be quality controlled. In Chapter 6 the study findings, conclusions and a recap of its intended contribution to management science will be presented.

1.4 Research Strategy

The research strategy adopted by this study is a multi-method qualitative strategy. The multi-method nature is due in part to the fact that the different published 'benchmark' offerings utilised different qualitative research methods in their development and were found to be beneficial. Specifically, a qualitative case study strategy utilizing the design procedures advocated by MIT psychologist Robert Yin (2003) and evidence analysis, reporting and quality control procedures advocated by sociologists Mathew B. Miles, Barney G. Glaser, Anselm Strauss and Juliet Corbin, were adopted (Miles & Huberman, 1994; Glaser & Strauss, 1967; Strauss & Corbin 1990). Case study evidence was also acquired and also analysed using the *'Long Interview'* method developed by Royal Ontario Museum cultural anthropologist and consumer behaviourist, Grant McCracken (1988). The *'Long Interview'* is a four step method of inquiry. Step 1 entails a "*review of analytic categories and interview design*". In the context of this study this consists of a very thorough review of extant literature on the subject of business forecasting practices and standards or benchmarks of the practice. Routine and somewhat mundane purposes of literature searches are that they allow the researcher to take advantage of previous research and stay in touch with the scholarly community on the subject in question. McCracken's views on this point are far more provocative and refreshing. He contends: "*.. the literature review has a special importance for the qualitative researcher. This consists of its ability to sharpen his or her capacity for surprise. The investigator who is well versed in the literature now has a set of expectations the data can defy. A thorough review of the literature is, to this extent, a way to manufacture distance. It is a way to let the data of one's research project take issue with the theory of one's field*" (McCracken, 1988: 31). In short, the proffer is that a good literature review apart from aiding in the construction of the interview questionnaire, is "*a critical process that makes the investigator the master, not the captive, of previous scholarship.*" This concept is termed a '*deconstruction*' of the scholarly literature.

Step 2 is deemed a "*review of cultural categories and interview design*". In essence this stage consists of a self examination of the researcher/investigator. The object is to give the investigator a detailed and systematic appreciation of his or her personal experience with the research topic. In the context of this study, the protocol calls for the author to examine his background, experiences, qualifications, incidents and associations as they relate to business forecasting practices and envi-

ronments. The expectation of this self examination is to take advantage of a potential, extraordinary intimate acquaintance with business forecasting practices. Should this expectation be fulfilled, the investigator thus possesses a *"fineness of touch and delicacy of insight that few ethnographers working in other cultures can hope to develop"* (McCracken, 1988: 32). This analytical advantage greatly assists in the construction of the interview plan and helps to identify cultural categories (firm specific forecast practices) *not* identified by the scholarly literature. The cultural review and potential analytical advantages it can uncover, serve three purposes. Firstly, it aids in the interview plan construction by unearthing issues related to business forecasting practices not or improperly considered by the extant scholarly literature. Secondly, it prepares the investigator for the 'rum-maging' that will occur during evidence analysis, but makes this task easier by leveraging the analytical advantage to identify pattern matches in forecasting practices. Thirdly and most importantly, it challenges the investigator to manufacture 'distance' during the interview process. This act prevents a commonly occurring corruption of evidence gathered during interviews. In essence there is a considerable risk of evidence corruption when researchers unwittingly 'hear' information transmitted by an interview respondent not with their ears but with their own consciousness embedded with cultural experiences. *"They carry with them a large number of assumptions that can create a treacherous sense of familiarity"* (McCracken, 1988: 22). In sum, this stage trains the investigator to follow two processes, namely, 'familiarization' and 'defamiliarization'. The former process challenges the investigator to be knowledgeable, experienced and *au fait* with business forecasting practices and related measures of practice excellence. The latter process also challenges the investigator to be aware of the former, reasonably distance this knowledge from the testimony being sent during the interview and to listen to the informant.

Step 3 entitled *"interview procedure and discovery of cultural categories"* formally addresses the construction of the interview plan and recommended interview protocol and tactics. The goal is to allow the respondent forecasters at each RSA firm to tell their own story in their own terms while the investigator maintains a low and unobtrusive profile. The interview protocol is in essence a variation of an ethnographic investigation of the corporate forecasting culture in RSA firms. While designed as an open-ended interview, the investigator exercises subtle guidance of comfortable, true and authentic information flow. This is accomplished by initiating the interview with 'grand tour' questions (Could you describe a typical day of forecasting in your office?) followed by 'floating prompt' questions (MAPE, what do you mean by MAPE?) and finally 'planned prompt' questions. The latter questions allow the open-ended nature of the interview to also assume a semi-structured posture and ensure the travel plan of the interview discussion list is navigated. It also allows the respondent to consider forecasting issues that may not have readily come to mind. Planned prompts may be 'contrast prompts' (What is the difference between the two seasonal methods you just mentioned?), 'exceptional prompts' (What happened when the labour strike occurred?) and 'auto-driving'. The latter planned prompt uses visual aids (charts, reports, photos, videos) as a stimulus to illicit commentary or information from the respondent. Throughout the interview the investigator, as the instrument of information reception, must be on guard to be lis-

tening with his or her ears as outlined above. This applies not only to the reception of key forecasting terms but equally important, noise, in the form of impression management, topic avoidance, obfuscation, deliberate distortion, misunderstanding and outright incomprehension. Upon recognition of this noise appropriate remedies in the form of comforting, prompting, auto-driving and in the extreme case interview cessation must be undertaken.

Step 4, the “*interview analysis and discovery of analytic categories*” step provides the analysis and report writing roadmaps for the investigator to travel, from evidence to observations to conclusions to documented scholarly assertions. An evidence mining exercise is undertaken in the sense that the object of the analysis is not one of surveying the forecasting practice terrain, rather excavating the categorical relationships, associations and patterns buried in the forecasting respondent’s view of the practice of forecasting in general and his firm’s application of that world in particular. The investigator tackles this challenge by using intellectual capital in the form of scholarly literature suggestion of what ought to be present in the forecasting practice world, by bringing to the fore his own experience based suggestions of what ought to be present and finally, the insights most recently gleaned from the interviews. The investigator is encouraged to use all of this material as a guide to what may exist in front of him but must also be prepared to ignore all of it to “*see what none of it anticipates*” (McCracken, 1988: 42). This process of reevaluating one’s assumptions, experiences and the presumptive scholarly literature is quite consistent with other forms of qualitative approaches and in particular Glaser and Strauss and Strauss and Corbin’s grounded theory approaches (Glaser & Strauss, 1967; Strauss & Corbin, 1990).

The above analysis process has mechanistic and indeterminate characteristics and is broken down into five stages. Stage 1 consists of a thorough review of interview records to understand the contents of the interview from an emic perspective (the views of the forecast respondent) and from an etic perspective (the investigator’s observations). In stage 2 the emic observations are independently examined to determine their meaning in the context of the scholarly literature on forecasting practices and the investigator’s experiences and assumptions of business forecasting practices. In stage 3 the observations are examined in relation to each other to determine emergent themes, patterns and inter-relationships. Once again the results of the related observation review are checked against the scholarly literature and the investigator’s experience and assumptions on forecasting practices. Stage 4 involves a determination of the basic themes by examining clusters of respondent views and comments as well as the investigator’s notes or memos in response to the comments and views. The purpose behind this action is to search for theme consistency and contradiction. Stage 5 calls for review of stage 4 conclusions from all interviews with the intent of merging all the dominant interview themes into scholarly conclusions or theses. In essence the goal is to complete the analytical circle by merging cultural categories into analytic categories or in terms of this study to take the particular forecasting experiences and actions of individual RSA firms and merge them into general properties of thought and action (practice) within that business community.

1.5 Study Evidence

Four types of evidence are gathered, investigated and analysed in this study, three pertinent to the determination of Western forecasting practices and one pertinent to the determination of South African forecasting practices. The different types of evidence are summarised in this introduction and then dealt with in detail in Chapters 2 through 5.

The first type of evidence is period discrete, qualitative, forecasting practice event driven data developed and published over a four phased 20 year period, by researchers at the University of Tennessee. The compilation of these data started in 1982. Phases one and two consisted of the compilation of cross sectional survey based data and the results were documented in the JoF in 1984 and 1995 (Mentzer & Cox, 1984; Mentzer & Kahn, 1995). Phase three consisted of face to face interviews of managers involved in forecasting activities at 20 US firms. The results of this empirical research were published in the *Business Horizons* journal of the Indiana University Business School (Mentzer *et al.*, 1999). Phase four consisted of face to face “forecasting audits” of 16 US based Fortune 500 firms. The results of these audits were published in the IJF in 2003 (Moon *et al.*, 2003). All told the researchers indicate “the practices, successes and problems” of a total of 410 US firms have been gathered and the authors refer to these data as ‘forecasting benchmarks’ (Moon, 2004).

The second type of evidence is period discrete, quantitative, forecasting attribute data developed and published by the Institute of Business Forecasting (IBF). The IBF publishes, markets and sells these data as “benchmarks of forecasting practices”. These data are compiled from surveys of attendees of the IBF’s “Best Practices Conferences and Tutorials”. There were five of these conferences in 2001, 2002, 2004, 2005, 2006, four in 2003 and six in 2007 (Jain, 2001-2007, 2006b). Forecasting practice attributes include, *inter alia*, practitioner’s salaries, software usage, process usage, methods usage, error measurements, employment levels of forecasters and age of the forecasting function. Response tallies of each attribute range from 200 to 1,100 valid responses depending upon the year in question. Again, depending upon the year in question, 16% to 18% of the responses are from attendees representing firms from Western Europe, Canada and Mexico. These data are provided both on an aggregate level and industry level. Depending upon the year of the survey 13 to 18 industries are tallied. The industries tallied are, *inter alia*, Automotive, Consumer Products, Food/Beverages, Computer/Technology, Pharmaceuticals, Retail, Telecommunications and Services. These discrete annual data points are then analysed and converted into annual time series data.

The third type of evidence is gathered from face to face interviews with 30 high level executives (engaged in forecasting activities) representing 20 South African firms participating in this study.

The firms selected are diverse in terms of size, type of business and industry. Qualitative forecasting event and process evidence gathering is the main focus of the interviews but quantitative forecasting attribute evidence is also compiled from the ethnographic style interviews conducted at the firms. The evidence is not longitudinal but rather a recent 'snap-shot' determination and compilation of discrete qualitative events, processes and quantitative attributes.

The fourth type of evidence is longitudinal and is derived from primary research, namely a 20 year case file history of actual forecasting consulting assignments undertaken and completed by the author and paid for by firms in South Africa, Western Europe, the Far East and the US. This case file history also provides evidence on qualitative events, processes and quantitative attributes and thus serves as corroboration or impeachment of the above described Type 1 and Type 2 evidence. The Type 1 and Type 2 evidence, despite being published, is in the context of this study the product of secondary research that has not been verified or materially validated. While this study acknowledges and respects the *bona fides* of the researchers involved, the quality bar of this study requires due diligence. Accordingly, where there is a discrepancy between the published evidence (Types 1 and 2) and Type 4 the protocol of this study is to alter, amend, append or substitute the latter evidence for the former based upon the predicate of the Type 4 evidence being known to be true and accurate.

1.6 Chapter Summary

This chapter has introduced the social action of forecasting from an historical perspective and has moved the time line and focus of this action to contemporary corporate environments. Within this context the problems and challenges facing the modern day business forecaster are illustrated. The *raison d'être* of this study is to analyse and address these problems and challenges with the intent of mitigating both. The schema of the study is presented as well as an overview of the research strategies to be employed and the types of evidence that will be gathered, analysed and utilised in forming conclusions. Further details of each will be provided and explained in subsequent chapters of the study as each topic is dealt with individually.

"The good literature review is a critical process that makes the investigator the master, not the captive, of previous scholarship." (Grant McCracken)

2.1 Literature Review of Western Qualitative 'Benchmarks'

Focus on forecasting practices beyond mere method or model determination and more as an overall management discipline started circa 1977. Makridakis and Wheelright in the October, 1977 edition of the *Journal of Marketing* are quoted as "... there are three major areas that represent significant challenges to the marketing manager if more effective forecasting is to become a reality. These supersede the question of selecting a methodology and deal with the practical problems of successful forecasting" (Makridakis & Wheelwright, 1977). This theme was further developed by three seminal articles of Armstrong (1982), Schultz (1984) and Fildes and Hastings (1994). A common theme of all three papers was the presentation of a set of qualitative event or action criteria the researchers believed were necessary and compatible with successful and effective forecasting management. Armstrong referred to the events or action criteria as "*pitfalls*", Schultz as "*implementation profile factors*" and Fildes and Hastings as "*aspects of an organization's response*". Next came Moon *et al.* (1988) with "*seven key focus points*" followed by Mentzer *et al.* (1999) with "*four dimensions*" which were now offered as 'best practices benchmarks'. Moon *et al.* (2003) took the findings of his colleagues and offered an "*audit*" platform or vehicle to apply the "*four dimensions*" or 'best practices benchmarks' to other firms. It is noted Moon *et al.* (2003) do not make reference to a significant 2001 'upgrade' to the Armstrong (1982) "*pitfalls*". The 'upgrade' consisted of the "*pitfalls*" now evolving into a significantly larger number of "*principles*" (Armstrong, 2001). Despite all the different nomenclature, the research has resulted in the compilation of a set of qualitative forecasting events, action criteria or practices of Western firms surveyed. The latter were primarily from Western Europe, the United States and Canada. Differing from the point of commonality in the research above, was the reference to the types of forecast variables in question. Both Armstrong's '*pitfalls and principles*' and Schultz's '*profile factors*' did not differentiate between the types of forecasting variables. Fildes and Hastings's event criteria were variable specific and applied to market forecasting. Mentzer *et al.* referred to application of their '*benchmarks*' in sales forecasting practices, although they indicate a preference for the type of firms they surveyed to be conducting demand forecasting.

Summaries of the Armstrong (1982, 2001) '*pitfalls*' and '*principles*' are presented, in Exhibits 2.1 and 2.2 respectively, below:

Armstrong (1982)				
Forecasting Methods		No	?	Yes
1	Forecasting independence of top management	_____	_____	_____
2	Forecasts used objective methods	_____	_____	_____
3	Structured techniques used to obtain judgments	_____	_____	_____
4	Least expensive methods used	_____	_____	_____
5	More than one method used to obtain forecasts	_____	_____	_____
6	Users understand the forecasting methods	_____	_____	_____
7	Forecasters free of judgmental revisions	_____	_____	_____
8	Separate documents prepared for plans and forecasts	_____	_____	_____
Assumptions and Data				
9	Ample budget for analysis and presentation of data	_____	_____	_____
10	Central data bank exists	_____	_____	_____
11	Least expensive macroeconomic forecasts used	_____	_____	_____
Uncertainty				
12	Upper and lower bounds provided	_____	_____	_____
13	Quantitative analysis of previous accuracy	_____	_____	_____
14	Forecasts prepared for alternative futures	_____	_____	_____
15	Arguments listed against each forecast	_____	_____	_____
Costs				
16	Amount spent on forecasting reasonable	_____	_____	_____

Exhibit 2.1: Armstrong 1982 ‘Pitfalls’

Armstrong (1982) advises a score of 16 “Yes’s” to his ‘pitfalls’ “*indicates reasonable steps are being taken to obtain forecasts for the organization : it provides an ideal to work toward* “. On the other hand, a score of 16 “No’s” indicates “*gross negligence*”. No other evaluation granularity is provided. A profile of the sources or firms involved in the development of the benchmarks is not provided other than Professor Armstrong reflecting they are a product of his study of forecasting problems in the previous 20 years and a belief they are guidelines for “*good forecasting*”. With respect to Armstrong (2001), average ratings ranging from -2 to +2 are systematically generated from answers provided to the self audit questions from a list of 139 ‘principles’. Should one conduct the self audit of the 139 ‘principles’ from the website version of the audit, a systematic result is provided indicating any practice weaknesses and what they may be.

Armstrong (2001)		Number of Principles	Does the procedure follow the standard ?				
Problem			NO !		YES !		
			-2	-1	0	+1	+2
1	Setting Objectives	5					
2	Structuring the problem	7					
Information							
3	Identifying Information Sources	5					
4	Collecting Data	6					
5	Preparing Data	8					
Methods							
6	Selecting Methods	10					
7	Implementing Methods: General	7					
8	Judgement	8					
9	Quantitative	5					
10	Quantitative with Explanatory Variables	9					
11	Integrating Judgemental and Quantitative	5					
12	Combining Forecasts	10					
13	Evaluating Methods	32					
14	Assessing Uncertainty	13					
Using Forecasts							
15	Presenting Forecasts	5					
16	Learning	4					
	Total Number of Principles	139					

Exhibit 2.2: Armstrong 2001 ‘Principles’

A summary of the Fildes and Hastings (1994) “*aspects of an organization’s response*” is presented in Exhibit 2.3:

Fildes and Hastings (1994)	
The forecaster and the decision maker	
1	Forecaster and decision maker personality traits
2	Forecaster's training
3	Link between the forecast and end-user's decision
Information Flows	
4	Information flows from the environment
5	Information flows within the organisation
6	Support for information flows
Technical characteristics of the forecast	
7	Accuracy and Bias
8	Responsiveness and speed
9	Uncertainty estimation

Exhibit 2.3: Fildes and Hastings 1994 ‘Aspects of an Organization’s Response’

Fildes and Hastings’s determination of their ‘aspects of an organization’s response’ differ slightly from the Armstrong approach in that they first postulated a theoretical model of an idealized “*market forecasting system*” based upon preliminary interviews with ‘forecasters’ at a large UK based firm and a review of extant literature on the subject. They then set about testing the model against their case study findings conducted in 1987 at the same UK based firm. Fildes describes the firm as: “*one of Britain’s largest, most successful multinationals with activities spanning a wide range of technical markets.*” Robert Hastings’s affiliation listed in the research paper is that of Brisco Engineering Services Ltd. The unnamed firm is described as having 10 divisions, eight predominately concerned with industrial products and the remaining two selling directly to consumers. For simplicity sake the case study firm is hereafter referred to as ‘BES’. Forty five or 10% of staff members with forecasting responsibilities from all ten divisions and head office of BES were interviewed. A sample of 55 staff members from the same group, including the 45 respondents, received surveys. 45 responded. The result of the case study showed the firm meeting some of the nine ‘organizational response aspects’ shown in Exhibit 2.3 but “*many of the pre-conditions necessary for change were unfulfilled.*” The ‘response aspects’ shown in Exhibit 2.3 did not change as a result of the case study but is offered as a guide to further empirical research and for practitioners wishing to evaluate their forecasting practices. No quantitative granular measures of meeting or not meeting the qualitative benchmarks were offered.

The research route of Mentzer *et al.* was less direct than that of Armstrong or Fildes. Mentzer and Cox (1984) started out in 1982 with a mail survey researching mainly objective forecasting techniques. A random sample of forecasting managers from 500 US firms were sent questionnaires and 32% or 160 responded. The results in the context of this study were unremarkable. Ten years later Mentzer and Kahn (1995) conducted a similar mail survey of a random sample of 500 firms. 91% were US firms and 9% undefined firms, presumably Canadian. The 8 page questionnaire was essentially a replication of the 1982 survey with the design intended to answer the question if fore-

casting practices, within the context of method familiarity, usage, application and satisfaction, had materially changed from 10 years prior. Based on the 207 responses received, Mentzer and Kahn found, *inter alia*, there was greater reliance on and satisfaction with quantitative techniques compared to the 10 years prior. Despite this finding, they also discovered forecast accuracy had *not* improved over the ten years prior even though the familiarity and usage of the various sophisticated techniques had increased. The researchers did not address the apparent contradiction of respondents being satisfied with their new quantitative techniques yet at the same time indicating forecasting accuracy had not improved. What is the basis of their satisfaction? They did however conclude “*forecasting techniques alone will not necessarily improve accuracy. It is hoped that forecasting academics and practitioners can use the study’s findings to benchmark current forecasting practices.*” It appears to the present study that Mentzer and Kahn in 1995 published a conclusion or alternatively empirically verified Armstrong’s 1982 ‘pitfalls’. Mentzer *et al.* (1999) picked up the mantle of Mentzer and Kahn (1995), switched the directional focus of their research away from forecasting methods to forecasting management. They also dispensed with the quantitative mail survey methodology and switched to qualitative face to face interviews at 20 Fortune 500 firms. These interviews were conducted in 1996. A summary of the interviewed firms and their Net Sales (where available) for the 2002 through 2006 period is shown in Exhibit 2.4:

Firms	Type	Industry	Net Sales in US\$ billions				
			2002	2003	2004	2005	2006
1 Anheuser-Busch	Manufacturer	Beverage / Beer	13.6	14.1	14.9	15.0	15.7
2 Becton-Dickinson	Manufacturer	Medical Supplies	4.0	4.5	4.9	5.3	5.7
3 Coca-Cola	Manufacturer	Beverage	19.5	21.0	21.9	23.1	24.1
4 Colgate-Palmolive	Manufacturer	Personal Products	9.3	9.9	10.6	11.4	12.2
5 Fedex Corp	Services	Delivery Services	20.6	22.5	24.7	29.4	32.6
6 Kimberly Clark	Manufacturer	Household Products	13.2	14.0	15.1	15.9	16.7
7 Lykes Pasco	Manufacturer	Beverage	Private	n/a	n/a	n/a	n/a
8 Nabisco	Manufacturer	Food Products	Acquired (RJR)	n/a	n/a	n/a	n/a
9 JC Penney	Retailer	Department Stores	17.6	17.8	18.1	18.8	19.9
10 Pillsbury	Manufacturer	Food Products	Acquired (General Mills)	n/a	n/a	n/a	n/a
11 ProSource	Services	Speciality Retailer	Acquired (CCA Global)	n/a	n/a	n/a	n/a
12 Reckitt Colman	Manufacturer	Household Products	6.2	6.7	7.0	7.5	8.4
13 Red Lobster	Retailer	Restaurant and Bars	4.4	4.5	4.8	5.0	5.4
14 RJR Tobacco	Manufacturer	Tobacco	Acquired (Altria Group)	n/a	n/a	n/a	n/a
15 Sandoz	Manufacturer	Pharmaceuticals	1.8	2.9	3.0	Acquired	n/a
16 Schering Plough	Manufacturer	Pharmaceuticals	10.2	8.3	8.3	9.5	10.6
17 Sysco	Services	Food Products	26.1	29.3	30.3	24.3	25.8
18 Tropicana	Manufacturer	Beverage	Acquired (Pepsi)	n/a	n/a	n/a	n/a
19 Warner Lambert	Manufacturer	Pharmaceuticals	Acquired (Pfizer)	n/a	n/a	n/a	n/a
20 Westwood Squibb	Manufacturer	Pharmaceuticals	Acquired (Bristol Myers)	n/a	n/a	n/a	n/a

Exhibit 2.4: Mentzer *et al.* 1996 ‘Benchmark’ Firms

From the above exhibit it can be seen that 15 manufacturers, three service/distributors and two retailers were interviewed. The firms involved are quite large, accounting in 2006 for well over US\$200 billion or roughly 33% of South Africa’s US\$598 billion 2006 PPP GDP (Economist.com, 2006). The interviews and analysis led Mentzer *et al.* (1999) to conclude forecasting management may be divided into four dimensions namely, Functional Integration, Approach, Systems and Performance Measurement. Within each dimension Mentzer *et al.* identified ‘four stages

of effectiveness' or sophistication. They proffered firms may assess their current position in each dimension and be made aware of the various levels of potential improvement and sophistication by meeting the characteristics or standards of each level. The four dimensions were also reported as not being independent of each other rather they were "inextricably intertwined". Not surprisingly, none of the firms, despite their reported status of being leading financial and/or market share performers, were positioned at the fourth level of all four dimensions. Mentzer *et al.* concluded all the firms interviewed still had room for improvement. In fact all the participating firms were somewhat dissatisfied with their forecasting process. The Functional Integration stages and characteristics are shown in Exhibit 2.5:

Stage 1

- Major disconnections between marketing, finance, sales, production, logistics, and forecasting
- Each area has its own forecasting effort
- No accountability between areas for forecast accuracy

Stage 2

- Coordination (formal meetings) of marketing, finance, sales, production, logistics, and forecasting
- Forecasting located in certain area which dictates forecasts to other areas
- Planned consensus meetings, but dominated by one or more departments --no real consensus
- Performance rewards for forecasters only, based on contribution to reporting department

Stage 3

- Communication and coordination between functional departments and forecasting
- Existence of a forecasting champion
- Recognition that marketing is an unconstrained forecast and operations is a constrained forecast
- Consensus and negotiation process to reconcile marketing and operations forecasts
- Performance rewards for improved forecasting accuracy for all personnel involved in process

Stage 4

- Functional integration (collaboration, communication, and coordination) between departments
- Existence of forecasting as a separate functional area
- Needs of all areas recognized and met by reconciled marketing and operations forecasts
- Consensus process recognizes feedback loops
- Multidimensional performance rewards for all personnel involved in consensus process

Exhibit 2.5: Functional Integration Dimension

Mentzer *et al.* characterize 'functional integration' in terms of three themes. The first theme is the concept they term 'Forecasting C³' or communication, coordination and collaboration.

The second theme addresses the way a firm organises itself around the forecasting function and the last theme focuses on the extent to which different employees in different areas are held accountable for their contributions to the forecasting process.

The Approach dimension addresses what is forecast and how it is forecasted. Seven themes are offered that traverse across the proffered levels of sophistication.

The stages and characteristics are shown in Exhibit 2.6:

Stage 1

- Plan-driven, top-down forecasting (failure to recognize its interaction with marketing and business planning)
- Only shipments forecast
All forecasted products treated the same
- Naive or simple statistical approach, often with little understanding of techniques or environment
Failure to see role of forecasting in developing business plan (viewed solely as tactical function)
- No training of forecasting personnel in techniques or understanding business environment;
no documentation of forecasting process

Stage 2

- Bottom-up, SKU-based forecasting
- Forecast self-reported demand (recognized by the organization) or adjusted demand
- Recognition that marketing efforts and seasonality drive demand
- Recognition of relationship between forecasting and business planning, but plan still takes precedence
- Limited statistics training; little understanding of business environment; limited documentation of forecasting process

Stage 3

- Both top-down and bottom-up forecasting
- Forecast POS demand and back information up supply chain, and/or use key customer demand information ("uncommitted commitments")
- Use of ABC analysis or some other categorization for accuracy Identification of categories of products that do not need to be forecast (two-bin items, dependent demand items, special items)
- Use of regression-based models for higher-level (corporate to product line) forecasts and time-series models for operational (product to SKUL) forecasts
- Importance of subjective input from marketing, sales, and operations
- Forecasting drives business plan
- Training in quantitative analysis/statistics and environment
- Strong management support for forecasting process

Stage 4

- Top-down and bottom-up forecasting, with reconciliation
- Vendor-managed inventory factored out of process
- Full forecasting segmentation of products (ABC, two-bin, dependent demand, make-to-order, product value, seasonality, customer service sensitivity, promotion-driven, life cycle stage, shelf life, raw material lead time, production lead time)
- Understanding of "game playing" inherent in sales force and distribution channel (motivation for sales to underforecast and distributors to overforecast)
- Development of forecasts and business plan simultaneously, with periodic reconciliation of both (e.g., consideration of capacity constraints as part of long-range plan and forecasts)
- Ongoing training in quantitative analysis/statistics and business environment; top management support of forecasting process

Exhibit 2.6: Approach Dimension

Theme 1 is the orientation of the forecast ranging from bottom-up to top-down to plan driven to combinations of each. Theme 2 addresses the way the firm defines historical demand. Theme 3 investigates the degree of product and/or customer importance differentiation, if any. The existence of a forecasting hierarchy within the firm is theme 4. The level of forecasting technique sophistication is theme 5. The relationship between planning and forecasting is theme 6 and the final theme is the determination of the level of training and documentation of the forecasting process.

The Systems dimension reviews the computer and electronic hardware and software support for the forecasting function. These stages and characteristics are shown in Exhibit 2.7:

<p style="text-align: center;">Stage 1</p> <ul style="list-style-type: none"> • Corporate MIS, forecasting software, and DRP (distribution requirement planning) systems are not linked electronically • Printed reports; manual transfer of data from one system to another; lack of coordination between information in different systems • Few people understand systems and their interaction (all system knowledge held in MIS) • Islands of analysis exist • Lack of performance metrics in any of the systems or reports <p style="text-align: center;">Stage 2</p> <ul style="list-style-type: none"> • Electronic links between marketing, finance, forecasting, manufacturing, logistics, sales systems • On-screen reports available • Measures of performance available in reports and in the system • Reports periodically generated <p style="text-align: center;">Stage 3</p> <ul style="list-style-type: none"> • Client-server architecture allows changes to be made easily and communicated to other systems • Improved system-user interfaces to allow subjective input • Common ownership of databases and information systems • Measures of performance available in reports and in the system • Reports generated on demand/performance measures available online <p style="text-align: center;">Stage 4</p> <ul style="list-style-type: none"> • Open-system architecture means all affected areas can provide electronic input to forecasters • EDI linkages with major customers and suppliers to allow forecasting by key customer and supply chain staging of forecasts

Exhibit 2.7: Systems Dimension

This dimension investigated five themes. They are integration of forecasting systems with the firm's other systems, how reporting is conducted, how historical data is maintained, how performance measures are computed in the systems and the level of investment in the system infrastructure. The fourth and final dimension, Performance Measurement addresses what metrics are used to measure forecasting effectiveness and the information gathered to explain that performance. The stages and characteristics are shown in Exhibit 2.8:

<p style="text-align: center;">Stage 1</p> <ul style="list-style-type: none"> • Accuracy not measured • Forecasting performance evaluation not tied to any measure of accuracy (often tied to meeting plan, or reconciliation with plan) <p style="text-align: center;">Stage 2</p> <ul style="list-style-type: none"> • Accuracy measured, primarily as MAPE, but sometimes measured inaccurately (e.g., forecast, rather than demand, used in the denominator of the calculation) • Forecasting performance evaluation based on accuracy, with no consideration for the implications of accurate forecasts on operations • Recognition of the impact on demand of external factors <p style="text-align: center;">Stage 3</p> <ul style="list-style-type: none"> • Accuracy still measured as MAPE, but more concern with measuring supply chain impact of forecast accuracy (lower acceptable accuracy for low-value products, recognition of capacity constraints in supply chain and their impact on forecasting and performance) • Graphical and collective (throughout the product hierarchy) reporting of forecast accuracy • Forecasting performance evaluation still based on accuracy, but with more recognition that accuracy affects inventory levels, customer service, and marketing and financial plans <p style="text-align: center;">Stage 4</p> <ul style="list-style-type: none"> • Realization that exogenous factors affect accuracy and that unfulfilled demand is partly a function of forecasting error and partly of operational error • Forecasting error treated as indication of the need for a problem search • Multidimensional metrics of forecasting performance; performance evaluation tied to the impact of accuracy on achieving corporate goals (e.g., profitability, supply chain costs, customer service)
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Exhibit 2.8: Performance Measurement Dimension

Moon *et al.* (2003) furthered the research and use of these dimensions and characteristics by conducting a five year forecast audit of an additional 16 firms. Moon *et al.* make clear the intent of their research was not to refine or embellish upon the Mentzer *et al.* (1999) dimensions and characteristics. Rather, they adopted the latter as standards believing them to be the most comprehensive qualitative set research had yielded to date. They also believed Mentzer *et al.*'s framework served not only as a diagnostic/evaluative tool but also as a prescriptive one to improve forecasting practices. Consequently, they set out to validate the Mentzer *et al.* findings and establish an audit framework to meet the prescriptive goal of improving the practice. Moon *et al.* reports all 16 firms involved in the audit, despite their perceived diversity, participated as they all shared the realisation their forecasting practices were in need of improvement and the audit could help them identify and remedy deficiencies and problems in their forecasting practices. A summary of the 16 audited firms and their Net Sales (where available) for the 2002 through 2006 period is shown in Exhibit 2.9:

Firms	Type	Industry	Net Sales in US\$ billions				
			2002	2003	2004	2005	2006
1 Allied Signal	Manufacturer	Automation/Control	Acquired	n/a	n/a	n/a	n/a
2 Avery Dennison	Manufacturer	Consumer Products	4.2	4.8	5.3	5.5	5.6
3 ConAgra	Manufacturer	Food Products	18.6	13.3	10.8	11.4	11.5
4 Corning	Manufacturer	Telecommunications	3.2	3.1	3.9	4.6	5.2
5 DuPont	Manufacturer	Commodity Chemicals	24.0	27.0	27.3	26.6	27.4
6 Eastman Chemical	Manufacturer	Speciality Chemicals	5.3	5.8	6.6	7.1	7.5
7 Ethicon	Manufacturer	Medical Equipment	12.5	14.7	16.7	Acquired	n/a
8 Exxon	Manufacturer	Oil and Gas	200.9	237.1	291.3	359.0	365.5
9 Hershey Foods USA	Manufacturer	Food Products	4.1	4.2	4.4	4.8	4.9
10 Lucent Technologies	Developer	Telecommunications	12.3	8.5	9.0	9.4	8.8
11 Michelin NA	Manufacturer	Diversified Machinery	5.7	6.1	6.3	6.8	7.1
12 Motorola	Developer	Telecommunications	22.1	21.7	29.7	35.3	42.9
13 Pharmavite	Manufacturer	Dietary Supplements	Private	718.0	n/a	n/a	n/a
14 Smith and Nephew	Developer	Medical Equipment	2.1	1.9	2.3	2.6	2.8
15 Union Pacific Railroad	Services	Railroads	11.2	11.6	12.2	13.6	15.6
16 Williamson-Dickie	Manufacturer	Apparel	Private	n/a	n/a	n/a	n/a

Exhibit 2.9: Profile of Moon *et al.* Forecast Audit Firms

The audit process as reported by Moon *et al.* is broken into three stages - data collection, data analysis and report delivery. In the first stage of data collection a liaison employee of the firm being audited is identified. Discussions with the liaison revolve around identifying a list of respondents, scheduling of the interviews and an exchange of documents related to the interview and the firm's current forecasting practices. In the second stage the auditors examine and analyze the practice information provided by the firm to obtain a pre-audit understanding of the firm's practices. In addition to receiving and analyzing this information the auditors prepare the liaison and the respondents for the interview process by providing them with an 8 page interview protocol. This document details the information the auditors wish to gather during the interviews and the first page of the published protocol is shown verbatim in Exhibit 2.10:

Sales Forecasting Audit Protocol

QUESTIONS ABOUT SALES FORECASTING ADMINISTRATION

**Start with a general request, which may answer many of the specifics given below:
Please describe the process you go through to develop each sales forecast.**

Specific Questions

To what extent are various functional departments involved in the development of sales forecasts ?
Examples: Engineering, Finance, Logistics, Marketing, Planning, Product Management, Production, R&D, Sales, Sales Forecasting

What approach is used by these functional departments to develop sales forecasts?

1. Do these departments use their own separate forecasts, or
2. Does one department develop a single forecast that all departments use, or
3. Does a forecast committee develop a single forecast that all departments use, or
4. Does each department develop its own forecast and a committee develops a final compromise forecast?

If #2, which department develops the forecast?

If #3 or #4, which departments are on the committee?

How satisfied are you with this approach?

What is middle management's role in developing sales forecasts? (Example: Review Only, Approval Only, Actual Involvement, Combination of These)

What is upper management's role in developing sales forecasts? (Example: Review Only, Approval Only, Actual Involvement, Combination of These)

At the beginning of each forecasting period, how does the sales forecasting process begin? (Example: sales forecasts developed by Computer System, Sales Force, Both Computer System and Sales Force, Marketing, Forecasting/Planning Group)

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Page 1

Exhibit 2.10: Page1 of Moon *et al.* Sales Forecasting Audit Protocol

Following the document exchanges, analysis and preparation Moon *et al.* report on-site interviews were conducted by a team of four auditors split into two groups so that two auditors are present for each interview, “*providing the ability to assess inter-rater reliability*”. Each interview, lasting on average 45 to 60 minutes, is reported to have been audio taped. An average of 32 interviews per firm is reported to have been conducted. Based upon the answers provided by the respondents during the interviews, the auditor makes a subjective determination as to whether dimensional characteristics as shown in Exhibits 2.5 through 2.8 have been met. When a dimensional characteristic is met, the interviewer simply highlights it in the stage section of the dimension schedule. The audit study of Moon *et al.* concluded:

- (a) the “*benchmark criteria*” and framework developed by Mentzer, Bienstock and Kahn in 1996 had now been “*validated*” by the audit of Moon, Mentzer and Smith;

- (b) forecasting is a distinct and critical management function and not just an exercise in technique or software selection;
- (c) the auditing process was a means to examine the process of continuous practice improvement and further refinement was necessary to achieve ‘ *generalizability* ‘ of the ‘benchmarks’ to other practice settings. To this end they suggested further research should be done in incorporating the exemplars of Armstrong and Fildes and Hastings into the audit benchmark framework and;
- (d) outside, unbiased analysis is critical to the success of the audit as internal staff are far less reluctant to divulge information or participate in change when the auditors are perceived as not having internal political agendas.

2.2 Literature Review of the Forecasting Process ‘Benchmarks’

Section 2.1 presents a review of scholarly and applied literature of a broad range of Western forecasting practice ‘benchmarks’. This section narrows that range to an important analytical category of benchmarks that pertain to the actual forecasting processes used by practising forecasters. Armstrong’s (2001) preamble to his 16 categories of ‘principles’ is: “*When managers receive forecasts they often cannot judge their quality. Instead of focusing on the forecasts, however, they can decide whether the **forecasting process** was reasonable for the situation. By examining forecasting processes and improving them managers may increase accuracy and reduce costs.*” The preamble to the Fildes and Hastings (1994) “*model of the forecasting activity*” and their idealized marketing forecasting system is: “*The organization and staff support given to market forecasting will determine how effective an organization is in dealing with the environmental uncertainty it faces.*” Weinstein (1982) proposed a simplistic ‘typical forecasting system’ for industrial products. During that era, the technology or ‘systems’ era, it was quite common for the use of the noun ‘system’ to be used to describe a *de facto* process. This process is shown in Exhibit 2.11:

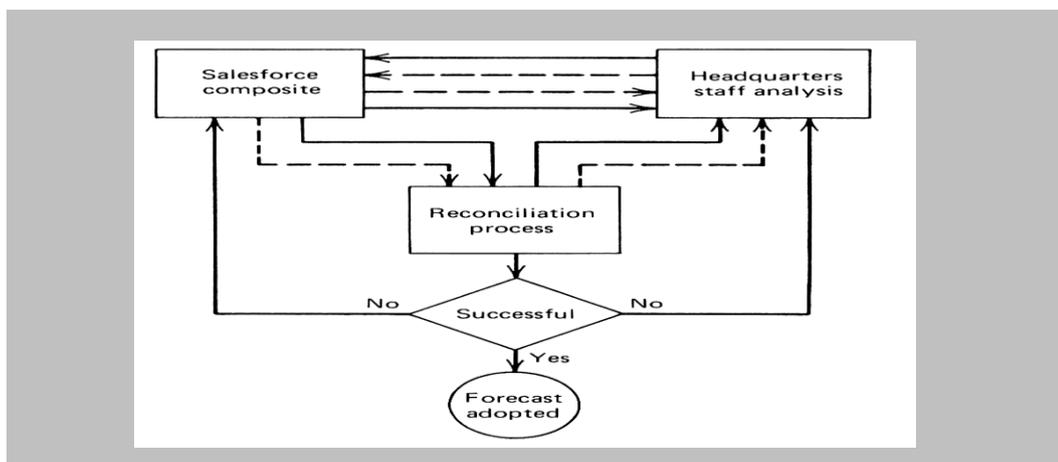


Exhibit 2.11: Weinstein – Typical Forecasting Process for Industrial Products

This simplistic approach presents the ‘bare bones’ of a forecasting process by capturing the development of composite sales forecasts and staff forecasts and a reconciliation process of the two forecasts. During this process back and forth communication is presented with the ultimate goal of the forecast being adopted.

Makridakis *et al.* (1983) presented a similar but more encompassing process for industrial products this time, specifically for the Cummins Engine Company. This process, once again referred to as a ‘system’ takes into account influences external to the firm such as economic and market factors while expanding upon Weinstein’s internal approach to capture activities related to production and financial planning. The process is shown in Exhibit 2.12.

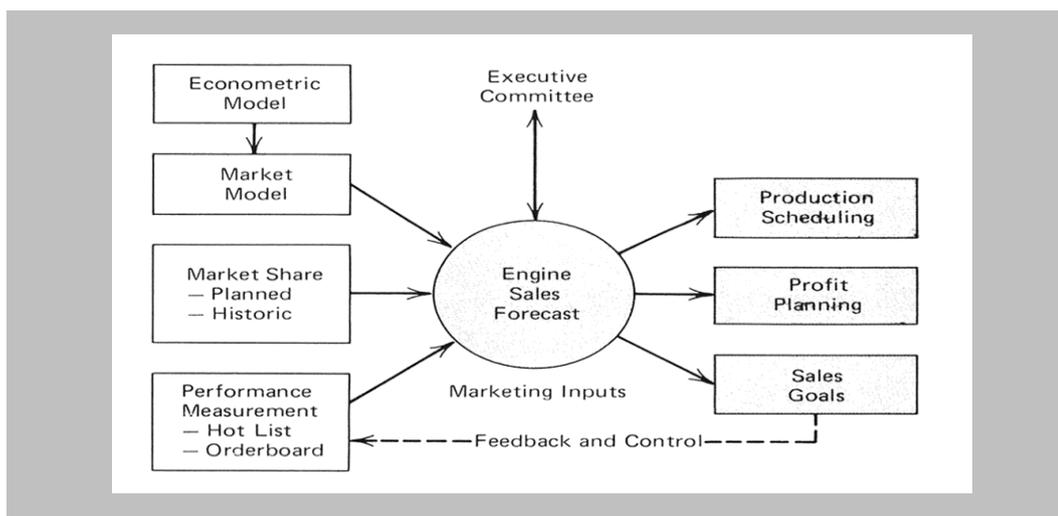


Exhibit 2.12: Makridakis *et al.* – Cummins Engine Company Forecasting Process

Approximately 10 years later, in 1994, Fildes and Hastings, building upon the work of Weinstein and Makridakis *et al.* postulated their diagnostic “*model of the forecasting activity*” in the form of their “*idealized market forecasting system.*” The postulated process expands upon the *ex post* processes presented by Weinstein and Makridakis *et al.* Most notably, the process incorporates the participation and actions of the forecaster. Also included is a distinction between the development of long and short term forecasts as well as finer granularity of the internal dynamics of the functional departments of Sales, Marketing, Planning, Finance and ‘Management Services’ which is most likely IT Support in today’s terminology. Unlike the Makridakis *et al.* process, the postulated process does not explicitly consider macro external influences such as industry and econometric forces save to say the process might be supplemented by market research on the firm’s products and competitors. It does however present an interesting dimension namely, avenues for a firm’s forecasting participants to circumvent the process to achieve their own goals, in this case adequate quantities of a product from the firm’s manufacturing department. Fildes and Hastings tested their *ex ante*, postulated process at the 10 divisions of BES and not surprisingly found, *inter alia*, a key element to the success of the process and effective forecasting is the ability and effec-

tiveness of the forecaster in monitoring and 'driving' the forecasting process. The postulated process is shown in Exhibit 2.13:

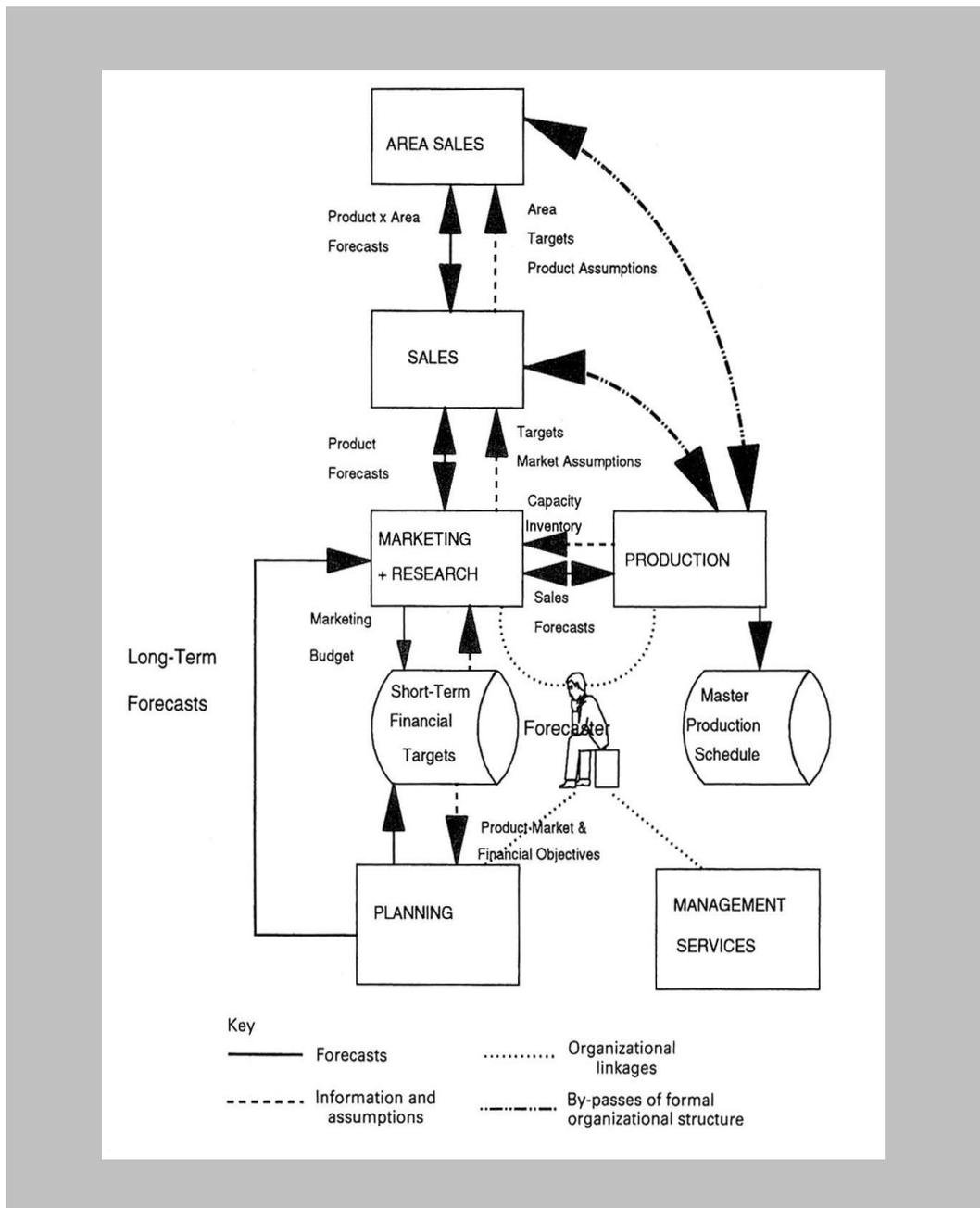


Exhibit 2.13: Fildes and Hastings – The Marketing Forecasting System

In addition to the forecasting processes submissions from the academic sector, the practitioner sector itself has, over the years, offered their versions based upon experiences at their firms. These offerings, like the academic versions, range from the simplistic to the elaborate. To wit, Lavalley II (1998) from Solutia Inc (formerly the Chemicals Division of Monsanto Company) reports his firm's relatively simple forecasting process that is similar to that of Makridakis *et al.* The only

dimensions added to this edition are the explicit inclusion of DRP and MRP systems. This process is shown in Exhibit 2.14:

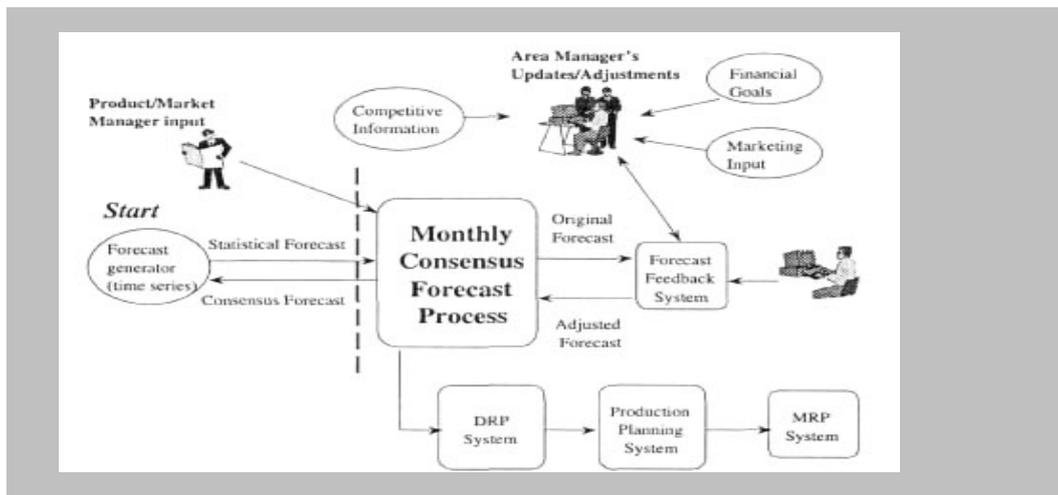


Exhibit 2.14: Solutia Inc., Sales Forecasting Process

Circa the Autumn of 1999, The Coca-Cola Company’s Charles Chase suggests an elaborate “*New Millennium*” approach to the forecasting process with the underlying theme of the role of the forecaster being expanded from the perceived one of “*accurate point estimators of current trends*” to that of business analysts influencing customer demand rather than commentating on customer demand (Chase, 1999). In addition the Chase submission explicitly includes the current in vogue Sales and Operations Planning (S&OP) and Collaborative Planning, Forecasting and Replenishment (CPFR) processes as part of the offered ‘New Millennium’ demand forecasting process. This process is shown in Exhibit 2.15:

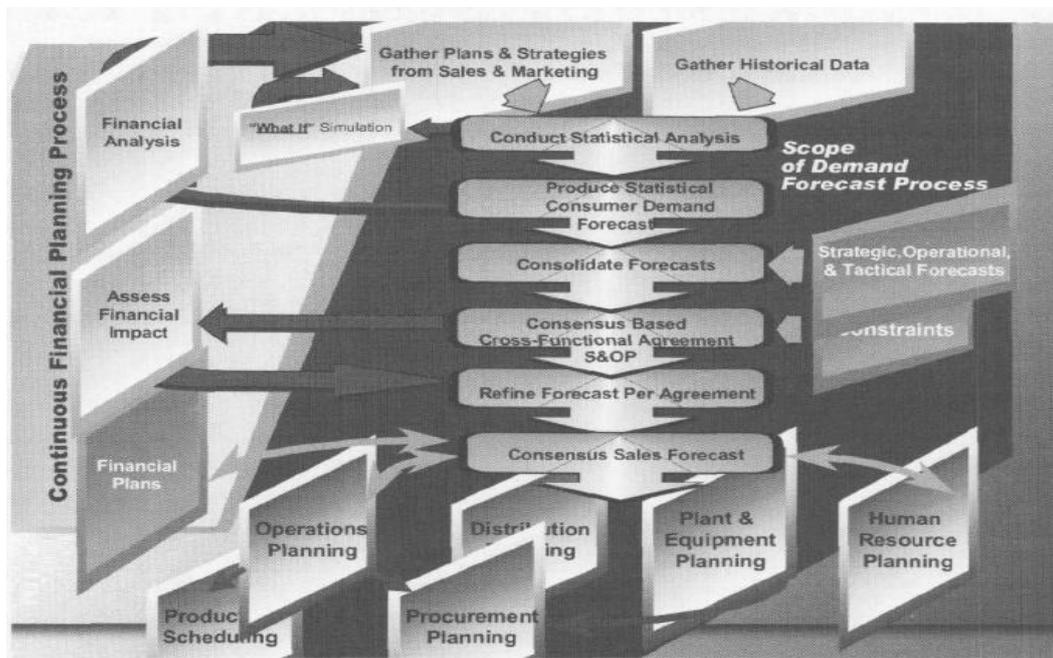


Exhibit 2.15: ‘New Millennium’ Demand Forecasting

2.3 Deconstruction of Western Qualitative ‘Benchmark’ Literature

As summarised in Chapter 1, the first step of the study research strategy is a review of forecasting practice analytic categories and interview design. This entails an exhaustive review of the scholarly and applied literature on the subject. This review is not simply an exercise in idea collection but a critical appraisal to unearth the conscious and unconscious assumptions the scholarly enterprise makes in defining the problems, issues and findings of business forecasting practices. This critical appraisal is termed the ‘deconstruction’ of the scholarly literature and is the subject of this section of the study. Part of the deconstruction is explicit in the literature itself, part is not.

Explicit deconstruction of the Mentzer *et al.* (1999) and Moon *et al.* (2003) qualitative dimension characteristics and audit framework audit research is provided by the IJF paper of Fildes *et al.* (2003). This paper titled “*Researching Sales Forecasting Practice Commentaries and authors’ response on ‘Conducting a Sales Forecasting Audit’*” appears as a peer review piece but in essence was an audit of the audit. The deconstruction is intense and withering. Bretschneider of Syracuse University concludes the research “*falls short*” and states: “*Unfortunately this paper continues in the tradition of making prescriptions based on simple observations, common sense and intuition, all admirable and appropriate for consultants, real world managers, and the beginnings of a research process but not where we need to end up.*” His principle points of issue are those of competency and causality. Firstly, he argues that the Moon *et al.* (2003) approach does not clearly define what the criteria or measures of successful forecasting are and more importantly that no evidence has been presented that compels one to believe that following their audit protocol results in successful forecasting achievement - the issue of causality. Secondly, and with greater emphasis, he questions whether forecast researchers in general have sufficient research training to be conducting what amounts in the subject at hand to be organizational research. As the issue of cause and effect is the key to the validity of dimension and audit framework, Bretschneider argues this is more in the domain of sociologists, social psychologists and political scientists rather than mainstream forecasting researchers that typically have statistical, econometric and operations research backgrounds. Cultural anthropologist Grant McCracken, whose research protocol this study is adopting and adapting, chimes in on this point from a different and more general perspective that researchers need to ‘manufacture distance’ to fully understand the subject before them. He states: “*Scholars working in another culture have a very great advantage over those who work in their own. Virtually everything before them is, to some degree, mysterious. Those who work in their own culture do not have this critical distance from what they study. They carry with them a large number of assumptions that can create a treacherous sense of familiarity*” (McCracken, 1988: 22). Moon *et al.* rebut Bretschneider by stating they followed established qualitative research procedures in conducting the benchmark and audit studies citing references to McCracken and grounded theory works of Glaser and Strauss (1967 & 1999) and Strauss and Corbin (1990).

Collopy of Case Western Reserve University also concludes the study “comes up short” (Fildes *et al.*, 2003: 31). His principal explicit points of issue are the audit’s ‘predetermined standards’ and the nature of the firms interviewed in the Mentzer and Moon *et al.* (2003) studies. The qualitative dimension characteristics and audit framework offered by the published research of Mentzer *et al.* (1999) and Moon *et al.* (2003) as practice ‘benchmarks’ are essentially derived from interviews and/or audits over a ten year period of three dozen US based, large multinational corporations. The implicit question raised is, are the firms selected reflective and indicative of best practices in forecast management or are they merely examples of the forecasting practices of successful sales growth driven firms? Moon *et al.* (2003) responded to the critique by stating: “*The sampling plan of Mentzer, Bienstock, and Kahn (1999) was companies with a wide range of sales forecasting management success to observe factors that relate to that success*” (Fildes *et al.*, 2003: 38). However, a very close reading of Mentzer, Bienstock, and Kahn (1999) reveals an apparent contradiction. The latter state: “*We selected 20 companies with histories as leading financial and/or market share performers, though not necessarily top performers in sales forecasting*” (emphasis added), (Mentzer *et al.*, 1999: 40). In a book published in 2006 on the same subject Mentzer and Moon state: “*We were interested in including companies that had reputations as top performers, though not necessarily top performers in sales forecasting*” (Mentzer & Moon, 2006: 254). The present study thus concludes the Mentzer *et al.* ‘benchmark’ and Moon *et al.* audit firms were, on the whole successful firms at the time of the studies, but not necessarily successful in forecasting practices. To be fair to Dr. Moon, let us assume the firms interviewed were also successful in forecasting practices at the time of the studies. Will they stand the test of time as the source of recommended ‘best practice benchmarks’ that form the foundation of his audit framework? The often cited example in this situation is the Tom Peters book ‘*In Search of Excellence*’ where, in 1982, under the subtitle “*Lessons from America’s Best Run Companies*” he identifies ‘8 factors’ or management practices of three dozen firms as benchmarks and concludes other firms may learn lessons from these practices. Makridakis however, notes in his 1990 book, only 7 of the 36 firms mentioned as benchmarks in the Peters book appeared in the 1987 Business Week study of the ‘*Top 46 of America’s leanest and meanest companies*’ (Makridakis,1990). Makridakis notes further *Fortune* magazine published a few months later its annual survey of ‘*America’s most admired companies*’ and among the top ten, six did not appear in ‘*In Search of Excellence*’. In fact the latter’s favourite IBM was listed in 32nd place and Wang Labs another ‘excellent’ firm had slipped to the bottom of the Fortune 300. Makridakis in essence poses the question of durability stating if ‘*excellent*’ firms prior to 1980 could not meet their own standard 10 years later, “*can they really offer lessons on excellence to others?*” In sum, the explicit and implicit questions raised by Collopy are those of validity and durability.

Lawrence of the University of New South Wales also explicitly raises the question of validity, not pertaining to the firms interviewed but to the forecasting dimension characteristics and the audit framework architecture. In so doing he implicitly raises the question of causality although he inadvertently refers to the issue as ‘correlation’ (Fildes *et al.*, 2003: 31). He opines: “*There is no point*

in designing an action plan to move an organisation up the stages on each dimension in the MBK framework if there is no assurance that a higher stage will lead to better forecasting.” In support of this opinion a sample of scenario questions are posed. Firstly, why should the existence of a ‘forecasting champion’ shown as a Stage 3 ‘benchmark’ in the Functional Integration dimension, be given a higher status than a Stage 1 firm without a forecasting champion? What if the forecast champion is incompetent with respect to forecasting? The implicit point being made is that existence is not axiomatic of excellence. Secondly, why is the functional integration between six departments a necessary prerequisite for ‘world class’ status when the goal is to ensure effective two way forecast communication between departments? Would not a stage 3 firm engaging in communication and coordination between the six departments be sufficient and more economical especially if a competent forecasting champion is at the helm? Thirdly, how does having on-screen reports, a stage 2 ‘benchmark’ in the Systems dimension necessarily outperform an email attachment with an accurate forecast from the forecasting champion? Numerous other examples may be cited to illustrate the point that one should not adopt the Mentzer /Moon *et al.* audit gradient as a path to forecast improvement as the research to date has not proved a causal relationship relationship between the gradients and forecast excellence. Accordingly, Lawrence concludes: “*I would be concerned about reading too much into the stages and treating them as a definitive identification of the forecasting effectiveness of an organisation.*” He instead views the framework as a “*coarse grid for sifting through the mass of data uncovered*” (Fildes *et al.*, 2003: 32).

Winklhofer of the Nottingham Business School and the last commentator of the Fildes *et al.* (2003: 35) paper provides a milder explicit deconstruction of the Moon *et al.* ‘benchmark’ and audit offering. Her focus is more on issues absent from the studies rather than present in the study. Specifically, top management support and the firm’s general attitude are not measured or assessed in the ‘benchmarks’ and audit. Secondly, is the marginal cost of attempting to improve the firm’s forecasting function less than the marginal benefit gained from a more productive and efficient forecasting management product? Moon *et al.* are silent on these issues. Implicit in Winklhofer’s absent issues is a suspicion that a more complete understanding of effective forecasting management needs to be researched from a rationale and attitudinal and cultural perspectives and not just from a ‘coarse grid’. Issue is also taken with respect to the ‘coarse grid’ as the Moon *et al.* excellence/sophistication stage progression works only on ordinal variables. Nominal variables such as the location of the forecasting function within the firm cannot be logically and progressively positioned on the rungs of the progression grid. Finally, an implicit issue is raised as to the quality of the research as measured by its external validity and generalizability. Clearly the types of firms interviewed are on the whole very large manufacturers, distributors and retailers. How would the audit fare on the floor of the forecasting department in a bank, or an investment broker or a fast food chain? Also the audits were conducted by Moon *et al.*, scholars of the subject and long time part-time consultants. What would the quality of the audit be in the hands of a recent MBA graduate hired into his first job as the forecasting manager, *à la* champion or the long time CFO, an accountant and the firm’s *de facto* forecaster? Clearly the audit protocol is designed for the skills of

experienced researchers and consultants and may be a dangerous tool in the hands of a neophyte or the wrong person involved in the forecasting function at a typical firm.

Heretofore deconstruction, both explicit and implicit, has taken place on the Moon *et al.* and Mentzer *et al.* contributions in the context of the Fildes *et al.* commentary. Deconstruction outside the scope of Fildes *et al.* and applied to the other offerings of the scholarly and applied literature in Section 2.1 and 2.2 is now discussed. Firstly, are the firms, researched in the aforementioned sections of this study, mainly large US based, multinational manufacturing firms representative of the ‘Western’ moniker or is this really a case of just US firm benchmarks? To answer this question let us first consider the case of Canadian firms. In 1997, after Mentzer *et al.* had just completed their study of the practices of 20 US based firms and just after Moon *et al.* had started their audit study, Klaasen and Flores (2001) conducted a survey of the forecasting practices of 118 Canadian firms. The firms were randomly selected and stratified into large and small manufacturing and large and small service groups. The results of the study revealed “*that practices in Canada are quite similar to the US but have some characteristics of their own.*” Five years prior to this study Flores and Duran (1998) also conducted a survey of the forecasting practices of 54 Mexican firms.. More than half of the firms surveyed were manufacturers and the rest from the retailing, finance and construction sectors. The results of this study showed Mexican firms lag US firms in their forecasting practices. It should however be noted this study focussed principally on forecasting method/techniques usage and the research was quite silent on the other aspects of forecasting management. The profile of the firm in the Fildes and Hastings study was a large UK based multinational manufacturing firm. A number of the “*aspects of an organization’s response*” developed from the Fildes’ study were similar to that of Mentzer / Moon *et al.* In short, published research to date does not offer any evidence to suggest the ‘benchmarks’ developed by Armstrong, Fildes and Hastings and Mentzer / Moon *et al.*, despite the high US weighting, is not representative of ‘Western’ firms. In fact analysis of Type 4 data show forecasting practices of European subsidiaries of US holding firms do not materially differ and therefore it is the posit of this study the ‘benchmarks’ presented are representative of ‘Western’ firms.

Secondly, can one proffer a set of ‘benchmarks’ or audit protocol from the study of three dozen firms? Moon *et al.* argue the firm total is not three dozen rather 410 gathered over 20 years of research. To wit: “*Thus the database from which we can now draw our conclusions about ‘world class forecasting’ consists of the practices, successes and problems 410 companies have experienced*” (Moon, 2004). However, the structured framework of the four stages of proficiency and associated ‘benchmarks’ Mentzer *et al.* advocate came initially from in-depth pioneering interviews at 20 firms and then an additional 16 ‘validation audits’ conducted by Moon *et al.* The remaining 374 firms surveyed, not interviewed or audited, by the author’s own admissions focussed on techniques and methods rather than overall forecasting management. The present study views the Mentzer/Moon *et al.* ‘benchmarks’ to have been derived from interviews at three dozen firms. The Fildes and Hastings study is derived from interviews at 10 divisions of the same multinational

manufacturing firm. Armstrong does not provide statistics or a profile of his 'benchmark' firms. The majority of the Armstrong and Fildes and Hastings 'aspects' are captured by the Mentzer/Moon *et al.* 'benchmarks' and again this study views the 'benchmarks' to have been derived from at least 45 forecasting sites. Again, is this sufficient to qualify the qualitative events/characteristics as benchmarks? Moon *et al.* address this issue via a rebuttal to Fildes *et al.* (2003). Moon argues their 'sampling plan' was aimed at achieving theoretical saturation rather than statistical 'generalizability' similar to the approach used in grounded theory and they selectively heeded the advice and guidance of McCracken: "*it is more important to work carefully with a few people rather than to work superficially with many*" and their advertising colleague at the University of Tennessee, Taylor (1994), who states: "*for quantitative research using in-depth interviews, a sample size of 15 to 30 individuals is typical to understand the phenomenon of interest.*" From this guidance and following the precepts of grounded theory research they believed they achieved theoretical saturation on each 'benchmark' with three dozen firms. This study accepts, for very different reasons than those put forth by Moon *et al.*, the number of firms they interviewed and the suggested range of the number of firms, is sufficient to determine benchmarks and assess an alien firm's forecasting practices. The reasons for this conclusion will be dealt with at length in Section 4.5.

Thirdly, the determination of the position or quality of a firm's forecasting practices relative to a set of benchmarks can be significantly influenced by the quality of the method of determination or measurement of the those practices. Specifically, to determine a firm's practices one may follow the often used approach of posting large numbers of questionnaires to personnel perceived to be knowledgeable on the subject of the firm's forecasting practices. Obvious pitfalls of this approach revolve around the quality of the respondent's actions and knowledge. Will the respondent take a reasonable amount of time to prepare a usable response, is the respondent qualified to answer the questions posed, is the respondent being truthful, is a truthful response accurate and will a respondent in fact respond at all? All of these questions and others highlight the deficiencies of this approach. One only has to examine closely the survey of forecasting practices of Mexican firms conducted in 1996 by Duran and Flores (1998) to gain an appreciation of the previous point. The authors collaborated with *Expansion*, the leading business journal in Mexico, to have the latter use its mailing list to send out a survey instrument to 1,000 top-level executives in marketing and sales at Mexico's top firms. The authors received 54 (5.4%) responses explaining "*Mexican managers are not accustomed to responding to questionnaires. Also, Mexican economic conditions at the time of the survey did not help. Firms were worried about surviving and probably not interested in answering a survey.*" Given these admissions, one must pause at the quality of the 54 responses and the author's findings of Mexican firm's forecasting practices, especially the use of modern techniques, as lagging those of US firms. Correspondence with Professor Flores as to whether a follow-up survey under better times and conditions has been conducted yielded the response: "*There is something in the mill but still far (sic). Thanks for the interest .*" The Armstrong (1982) diagnostic audit protocol, as shown in Exhibit 2.1, is designed for the respondent to answer 'Yes' or 'No'

or ‘?’ to 16 qualitative benchmark questions. 16 yes’s indicate: “*reasonable steps are being taken to obtain forecasts for the organization*” while 16 no’s indicate: “*gross negligence.*” Issues to be reflected upon with this *self audit* approach again revolve around the ability of the respondent. Specifically, has the respondent bothered to read Professor Armstrong’s fifteen pages of explanations and examples associated with the 16 questions? Does the respondent understand the questions and explanations? If the respondent does understand the questions and explanations is he or she qualified to provide an accurate and fair response on behalf of the firm? To wit, who makes the determination as to what is ‘reasonable’ in answer to question 16, “*Amount spent on forecasting reasonable?*”? To keep up with 21st century technology this approach has now been transported to the Internet. A struggling or proficient practitioner or researcher may now engage in a similar self audit by first defining on a web page the ‘forecasting problem’ he or she is trying to address and then based upon that defined problem answering either of ‘yes’, ‘no’ or ‘?’ to a subset of 139 questions of from the 16 categories of ‘benchmarks’ (Armstrong, 2001). Despite this technological advance the pitfall in the responding process remains the same as the manual process and spurious or low quality audit measurements may result. The audit and interview protocols adopted by Mentzer *et al.* and Fildes and Hastings address most of the operational deficiencies and issues of the other approaches discussed but not all. The operational deficiencies that still remain are the qualifications and competency of the instrument of inquiry – the person conducting the interviews. Details of this issue were previously discussed under the Winklhofer critique.

2.4 Deconstruction of Western Forecasting Process ‘Benchmarks’

The offerings of prescribed or ‘ideal’ processes for the practice to measure up to or adopt runs the gamut from the operationally simplistic to the philosophically challenging. The Weinstein offering’s benefit is its simplicity both from an operational and conceptual perspective. Its shortcomings are its narrow organisational focus with only sales and sales support staff positioned as the primary drivers of the process while other departments (marketing, economics and senior management) are seen as passengers or secondary participants in the process. Its scope of application is also narrowly defined as being only applicable to short-term operational forecasting in a manufacturing or industrial setting. The offering’s concluding posit is: “*This chapter has shown that due to the importance of the process of forecasting in an industrial product's (sic) company, statistical forecasting methods are not practical or attractive to management. The salesforce composite system, which is actually the dominant method for short-term forecasts, contains numerous situation-specific biases as well as several universal weaknesses. Several ways of treating the weaknesses in order to minimize their effects have been proposed, together with a framework that models the interface, occurring at various levels, between the forecaster and his or her superior. This framework should help in the analysis of a particular situation and in the assessment of some of the biases present*” (Weinstein, 1982: 426). Why is the existence of a defined and established forecasting process, in any forecasting setting whether it be an industrial, service or financial, mutually exclusive or at odds with the use of statistical methods? Why is it not feasible for the approaches to

be complementary or collaborative? The Weinstein research finding based upon *“three waves of interviews across numerous organizations”* that management view statistical forecasting, in the context of defined and even revered process, not *“practical”* or *“attractive”* should not be considered as an exemplar or ‘benchmark’ forecasting process. It should rather be considered as an example of process that presents an opportunity of further fulfilment or refinement, indeed a work in process. Weinstein also appears to be conceding the high ground by *“treating the weaknesses”* of a solitary forecasting approach (salesforce composite) on the basis of the comfort level or lack of skill, training and intellectual capital of the management involved. Would not challenging/confronting the illness be a better treatment than anaesthetising the symptoms?

The Cummins Engine process fills in a lot of the gaps of the Weinstein offering. It does however pivot around the external provision of econometric modelling services and thus may be beyond the capabilities of smaller firms in terms of resources and intellectual capital. It is also esoterically focussed to a heavy manufacturing setting and may not be generally transferrable to other sector/industry settings. Notwithstanding potential operating challenges the offering illuminates the very important concept of integration of various different forecasts in a single process – the very important practice missing or not confronted in the Weinstein process. This practice coupled with the philosophical orientation towards the process being market, industry and economy dependent and influenced, provides a valuable contribution and a marked refinement.

The Fildes and Hastings *“idealized forecasting system”* or *“marketing forecasting system”* is presented by the authors as having many similarities with the Weinstein and Cummins offerings. It certainly fills in a lot of gaps left by the Weinstein offering and replicates a lot of the features of the Cummins process. However, it does significantly depart from the philosophical orientations of both Weinstein and Cummins and by doing so appears to present somewhat of a paradox. The Cummins orientation or genesis point is defined thus: *“The forecasting process begins with a macro forecast obtained from an economic consulting service – with emphasis on national production and consumption data. This provides the economic backdrop or environment within which it is assumed that Cummins, its competitors and its customers will be operating. Company forecasters refine these tentative economic forecasts by taking into account their own assumptions regarding changes in the economy, as well as additional data especially important in connection with the company’s chief markets.”* (Makridakis, 2003). The process genesis point in Weinstein is the salesforce compiling a bottom-up composite forecast with the input and guidance of *“headquarters staff analysis.”* The latter analysis is comparable to the Cummins economic backdrop or environment. Clearly both approaches are bottom-up market, economy and industry driven. One would expect the monikered *‘marketing forecasting system’* of Fildes and Hastings, based upon a firm offering similar types of products and operating in similar environments, to follow the same approach. The process genesis point in the *“marketing forecasting system”* is defined thus: *“In this idealized organization, the short-term financial targets are set early in the budget round by the ‘Board’ (or ‘Finance’) which imply certain aggregate sales targets. These targets are passed*

down to 'Marketing' to be translated first into a set of marketing objectives, and, subsequently, a sales plan." *Prima facie*, this process is conflicted and a paradox. How does one have ostensibly a 'marketing process' when the boundaries of market demand penetration are being dictated and possibly constrained by entities and influences ("the 'Board' or Finance") farthest removed from the markets? This top-down Finance driven process is clearly at odds with Weinstein, Cummins and most notably Mentzer and Moon (2006: 9). To wit: "**many companies confuse the functions of forecasting, planning, and target-setting.** Operational plans for the level of sales to be achieved should be based upon the forecast of demand, but the two management functions should be kept separate. Similarly, target-setting should be done with a realistic assessment of expected future demand in mind, and this assessment comes from the sales forecast. In other words, the functions of planning and **target-setting should be informed by forecasts of demand**, but should not be confused with sales forecasting." Mentzer and Moon further support their position based upon the results of their own survey conducted a year after Fildes and Hastings. They report that: "in many responding companies (34%) the planning process is backward, that is, the business plan is used to develop the forecast instead of the other way around. Apparently, management in these companies is more concerned with the business plan than the sales forecast, even though the latter should drive the former." To their credit Mentzer and Moon suggest a remedy to this problem that is not significantly at variance with general process improvements suggested by Fildes and Hastings. The Mentzer and Moon remedy is framed thus: "Many companies have staunchly ingrained planning processes that start with earnings estimates that meet the expectations of external financial analysts and work backward to a "sales forecast." Changing this process to one that starts with a market-based sales forecast, develops the financial plan from this base, and iterates back and forth between sales forecast and business plan until a plan is reached that takes into account marketplace and financial realities is not an easy task. Again, the sales forecasting champion role as a mentor is an integral part of bringing such a change to fruition." One may further argue that the proffered "idealized forecasting system" or "marketing forecasting system" is at odds with itself. The authors identify the core of marketing and field intelligence emanating coming from the "centre" and assign this location with the special responsibility of ensuring the process is ordered resulting in others living up to their participative responsibilities. Specifically, they state: "In figure 1 information is seen as flowing from the centre down (e.g., macroeconomic activity, competitive behaviour, quality). The organizational aim should be to combine these differing information sources, and achieve a synthesis where information is available." Figure 1 referred to by the authors is Exhibit 2.13 in the present study. They also contend: "In Figure 1 responsibilities are assigned to ensure that information, assumptions and objectives flow from the centre to areas which respond with conditional forecasts. Without such clearly specified responsibilities the other, more informal, structures encourage confusion" (Fildes & Hastings, 1994: 13). These propositions seem perfectly plausible and achievable for any forecasting process but put in the context of the genesis point of the proffered "marketing forecasting system" one is given pause. What if the Board of BES decides a 20% sales growth is the target to achieve a £1.10 EPS and the market research department determines the primary market accounting for the growth is saturated and at the

same time external econometric consultants also determine an industry downturn is highly likely in the back half of the year which is the seasonal high for the primary sales markets? Who will prevail in this conflict? Figure 1 (Exhibit 2.13) does not provide an iteration loop back to the Board for discussion and dissent. Alternatively what if BES Finance wishes to get inventories/stocks under control and prevent current asset write-offs and determines they want to constrain supply consistent with a 10% sales growth, eight stock turns and write-offs at 0.5% of sales while sales and marketing want a product mix of 13 weeks of inventory to suffocate a smaller competitor out of the market and gain share? Who will prevail? Clearly, under Exhibit 2.13 the BES Board and Finance trump the 'centre' and the latter is marginalised to the role of staff sales and marketing support – a process paradox at odds with itself. An extreme but logical view is BES may be seen as a top-down supply or target driven organization with a 'marketing forecasting system' in place to ensure these goals are met in an orderly and successful manner.

Notwithstanding the above pause points and apparent paradoxes the Fildes offering does contribute a number of facets to be considered in developing a 'benchmark' forecasting process. One worthwhile facet is process recognition of potential circumvention (gaming the system) by the actors involved in the process. Most processes are blind to this conduct or ignore the fact that this circumvention takes place. Another worthwhile facet is the role and conduct of the process protagonist (the forecasting manager/champion) in general and in particular preventing 'gaming of the process'. Explicit incorporation of this facet into a 'benchmark' process as Fildes advocates is meritorious.

The Lavelle (1988) offering is unremarkable except for the explicit separation of MRP and DRP systems that appear as 'manufacturing' in the Cummins and Fildes offerings. The Chase (1999) offering is quite elaborate but is merely a detailed version of the Cummins process and indeed a validation of the latter developed circa 1977. One point of divergence between the two offerings is that Chase advocates a role of the forecaster and the process beyond prognostication of the *status quo* to the role of prescriptive changer of the *status quo*. This posit is very worthy of consideration.

2.5 Chapter Summary

This chapter unveiled the first step of the '*Long Interview*' research strategy, namely the review of the analytic categories and interview design. This step calls for a thorough review of the extant scholarly and applied literature on forecasting practices and associated benchmarks. This chapter focussed on the first type of 'benchmarks' which are qualitative in nature and various associated forecasting processes. This type of review differs from the norm however in that the literature review is considered a critical process that makes the investigator the master not the captive of previous scholarship. Accordingly, the latter part of the chapter was devoted to 'deconstruction' of the extant literature on qualitative 'benchmarks and forecasting processes.

Chapter 3 Continuing Review of Analytic Categories

"It is truth very certain that, when it is not in one's power to determine what is true, we ought to follow what is more probable." (René Descartes)

3.1 Literature Review of Western Quantitative 'Benchmarks'

The Western qualitative 'benchmarks' presented in Chapter 2 were derived from multiple sources and researchers. In contrast extant literature on quantitative 'benchmarks' are contributed from the research of a single source for reasons that will become apparent once the benchmarks are identified and explained. The single source in question is the US based Institute of Business Forecasting (IBF), a practitioner orientated educational and research centre. The IBF offers and conducts a number of "Best Practices Forecasting Conference /Tutorials" each year at different locations in the US. There were five of these conferences in 2001, 2002, 2004, 2005, 2006, four in 2003 and six in 2007. Attendees at these conferences are either employed as forecasters by their sponsoring firms or involved in the forecasting function in some fashion. Others are individuals who are interested in becoming forecasters. The sponsoring firms are generally upper midsize to large firms. To wit, 67% of the 2007 sponsoring firms had turnover figures exceeding US\$500 million and more (Jain, 2007: 10). At these conferences the attendees are surveyed and provide quantitative responses to seven categories of forecasting attributes associated with the firm's forecasting practices. The attributes number 25 in total. Compilation and analysis of the surveys result in the publication of the IBF's quantitative benchmarks editions of the Journal of Business Forecasting. The categories and benchmarks are shown in Exhibit 3.1:

	Forecasting Dimensions
1	Age of Forecasting Function
2	Number of Forecasters
	Management Support
3	Support of Upper Management
	Forecasting Process
4	Placement of Forecasting
5	Conflict of Interest Among Different Functions affect accuracy
6	One or Multi Number Forecasts
7	Forecasting Horizon
8	Periodicity of Forecast Generated
9	Production Locked Period
10	Forecast Revision
11	Monitoring / Documenting Forecast Accuracy
12	Incentive in Place to Improve Accuracy
13	Consensus Meetings
14	Sales and Operations Planning Process (S&OP)
15	Collaborative Planning (CPFR)
	Forecasting Methods
16	Type of Method

Exhibit 3.1: Quantitative Categories and Benchmarks

17	Type of Time Series
18	Type of Cause and Effect
19	Type of Judgmental
	Forecasting Error
20	Error Levels
	Software and Systems
21	Forecasting Software
22	Forecasting Systems
	Forecaster Profile
23	Salary
24	Background
25	Education

Exhibit 3.1 (Continued): Quantitative Categories and Benchmarks

All measures of the 25 attributes published by the IBF are simple averages of the aggregate responses obtained from the conference surveys. A brief description of each forecasting category attribute is as follows:

Forecasting Dimension Category

- (1) Age of the Forecasting Function - Measures the age of a *bona fide* forecasting function established at the firm in years. Forecasting function is defined as a dedicated, independent, full-time function whose charter is exclusively to forecast an array of business variables, *inter alia*, sales, order demand, services, market, industry and economic indicators. Part-time forecasting activity as part of another department such as forecasting cash flow or receivables/debtors in a budgeting or financial planning department does not constitute a forecasting function under the definition of this attribute.
- (2) Number of forecasters - Measures the number of hired employees whose job description is exclusively that of forecasting business variables as described in (1)

Management Support Category

- (3) Support of Upper Management - Measures the percent of respondents who believe their senior management is highly supportive, somewhat supportive or adverse to the existence of *bona fide* forecasting activities and/or the forecasting efforts of the respondents.

Forecasting Process Category

- (4) Placement of Forecasting - Measures the percentage departmental frequency location of the forecasting function amongst the firm's various departments.
- (5) Conflict of Interest Among Different Functions Affect Accuracy – Measures the percentage of respondents who believe the different forecasting agendas of different departments

at the firm affect the accuracy of the forecast. A typical example of this is the Sales and Marketing department wishing a high volume forecast to prevent stock-outs to customers while Operations prefers a lower number so they do not get caught with excess inventory while Finance is caught between the two to meet revenue and profit goals and at the same time effectively managing the firm's assets.

- (6) One or Multi-Number Forecasts – This attribute is sired from (5) above and measures what percentage of respondents report that their firms use one forecast as the basis of sales, operational, strategic and financial plans and what percentage of respondents report their firms use two or more forecasts for parochial plans.
- (7) Forecast Horizon – Measures in percentages how far into the future responding firms forecast according to specific periods in the future. Examples are 30, 60, 90 or 360 days into the future.
- (8) Periodicity of Forecast Generated - Measures in percentages the different types of period segments forecasts responding firms generate. Examples of this are monthly forecasts for the following year or quarterly forecasts for the next three years.
- (9) Production Locked Period – In the case of manufacturing forecasting settings, this attribute, measures in percent, the different time periods that responding firms do not tamper with or adjust their production plans thereby rendering any changes in forecasts for those time periods moot. This attribute is not applicable to service, econometric and financial applications. An example of this would be to 'freeze or 'lock' the production quantity of a specialized product for the first 30 days of each production period.
- (10) Forecast Revision – Measures in percent how often, according to defined time periods, respondents revise their forecasts.
- (11) Monitoring and Documenting Forecast Accuracy – Determines the percentage of respondents who pay attention to the forecast errors that have been experienced in the past.
- (12) Incentive Plan in Place to Improve Accuracy – Determines what percentage of responding firms either provide monetary or promotional bonuses for improving the accuracy of forecasts produced by its forecasters.
- (13) Consensus Meetings – Measures the percentage of respondents who utilize the forecasting process instrument of consensus meetings to reconcile different forecasts of the same variable produced within a firm.

- (14) Sales and Operations Planning Process (SO&P) - Measures the percentage of firms who have adopted SO&P. The latter is a recent management development for reconciling sales, demand and budgets in an attempt to optimize a firm's assets.
- (15) Collaborative Planning, Forecasting and Replenishment (CPFR) – Assesses what percentage of firms extend SO&P, which is an internal collaboration process, beyond the walls of the firm to its customers and collaborate with them in the areas of end-user customer demand and inventories/stocks levels.

Forecasting Methods Category

- (16) Type of Method/Model – Determines the percentage of respondents who use Time Series, Cause and Effect, Judgemental and Other forecasting methods/models.
- (17) Type of Time Series Method – Five different types of time series forecasting method usage by respondents are measured in percentages.
- (18) Type of Cause and Effect Model - Three different types of cause and effect forecasting model usage by respondents are measured in percentages.
- (19) Type of Judgemental Method - Five different types of judgmental forecasting method usage by respondents are measured in percentages.

Forecasting Errors Category

- (20) Error Levels – Forecast errors experienced by respondents are recorded using the MAPE (mean absolute percentage error) measurement. These percentage errors are measured at the lowest level of forecasting activity namely, the stock keeping unit (SKU) level, a product or service category level and finally at the aggregate firm level with the latter level being enumerated in either sales, orders, profits or earnings at the monetary or nominal level of measurement.

Software and Systems Category

- (21) Forecasting Software – Measures what percent of respondents use spreadsheet packages for their forecasting tasks and what percentage use *bona fide* statistical time series and causal method/model packages for their forecasting tasks.

- (22) Forecasting Systems – Measures the percent of usage of large scale, integrated, commercial forecasting systems by respondent firms. Usage of five major vendor system types together with a remaining ‘Other’ vendors category are tracked.

Forecaster Profile Category

- (23) Forecaster Salary – The annual salaries paid by respondent firms at various levels of forecasters employed by the firm are reported in thousands of USD.
- (24) Forecaster Background – The individual functional or departmental area or academic discipline the current respondent forecasters have hailed from is measured in percentage terms. These areas range from Finance/Accounting to Sales to Mathematics and Statistics to other functional areas of the firm or academic disciplines.
- (25) Forecaster Education – The individual academic qualification level obtained by the respondent forecasters are measured in percentages.

16 to 18% of the attendees represent firms from Western Europe, Canada and Mexico. In addition, the surveys capture measurements and resultant benchmarks for the following 10 industries/sectors:

- (a) Automotive
- (b) Computer/Technology
- (c) Consumer Products
- (d) Food/Beverages
- (e) Healthcare
- (f) Industrial Products
- (g) Pharmaceuticals
- (h) Retail
- (i) Telecommunications
- (j) Transportation

It should however be noted, response rates in certain industries, such as the Telecommunications industry, due to deregulation, are inadequate and these and other like data are not used in this study. The IBF explain their position on this issue as: *“In drawing conclusions on various issues, one should pay close attention to the number of responses. The number of responses in certain categories was very small, which is given in most cases. The idea is that some information is better than no information. As the forecasting function continues to grow in importance, more detailed and definitive data will emerge, allowing even stronger insight and inferences regarding the direction of the forecasting profession.”* (Jain, 2006b: 6).

The seven categories of 'benchmarks' of the 10 industry aggregate surveyed at the IBF conferences for the years 2000 to 2007 are shown in Exhibit 3.2. Different measures for each of the 'benchmarks' are shown in the exhibit and consist of average years, average number of employees, average percentages for the majority of the 'benchmarks' and median salaries for forecasting employees. The 'nd's' in Exhibit 19 indicate a particular attribute was not surveyed in certain years or the IBF did not publish the results of the survey:

		All Industries							
(Calendar Year)		00	01	02	03	04	05	06	07
Forecasting Dimensions									
1	Age of Forecasting Function (in years)	5.5	5.6	5.7	5.4	5.6	5.0	5.1	7.3
2	Number of Forecasters (in employees)	4.7	4.6	4.4	3.7	4.7	3.4	4.2	4.9
Management Support									
3	Support of Upper Management (in percent)								
	Highly	44.0	45.7	47.7	42.3	44.0	43.0	57.0	54.0
	Somewhat	52.0	49.5	48.9	54.3	53.0	51.0	42.0	45.0
	No Need	4.0	4.8	3.4	3.4	2.0	6.0	1.0	1.0
Forecasting Process									
4	Placement of Forecasting (in percent)								
	Finance	12	14	10	9	6	5	7	7
	Forecasting	7	10	9	11	12	8	12	19
	Strategic Planning	5	6	5	4	3	12	4	6
	Forecasting and SP	11	16	15	14	15	20	16	25
	Logistics	10	9	14	10	12	12	11	7
	Operations/Production	19	20	20	25	25	26	26	27
	Supply Chain	29	29	35	34	37	38	37	34
	Marketing	19	20	20	21	15	13	14	12
	Sales	17	12	13	15	15	17	15	10
	Sales and Marketing	36	32	32	36	30	30	29	22
	Other	11	9	8	7	12	8	11	12
5	Conflict of Interest Among Different Functions affect accuracy (in percent)								
	Yes	69.0	58.5	65.7	63.0	69.0	64.0	63.0	60.0
	No	31.0	41.5	34.3	37.0	31.0	36.0	37.0	40.0
6	One or Multi Number Forecasts (in percent)								
	One-Number	nd	56.4	55.6	52.0	47.0	56.0	40.0	49.0
	Multi-Number	nd	43.6	44.4	48.0	53.0	44.0	60.0	51.0
7	Forecasting Horizon (in percent)								
	One Month	18.1	18.4	12.1	16.7	15.0	12.0	10.0	13.0
	One Quarter	17.7	17.4	15.9	17.5	17.0	17.0	16.0	16.0
	One Year	34.8	34.4	36.8	41.4	39.0	46.0	44.0	36.0
	Year +	29.5	29.8	30.2	24.4	29.0	22.0	29.0	35.0
8	Periodicity of Forecast Generated (in percent)								
	Weekly	nd	nd	nd	nd	11.0	nd	14.0	17.0
	Monthly	nd	nd	nd	nd	41.0	nd	42.0	38.0
	Quarterly	nd	nd	nd	nd	15.0	nd	13.0	14.0
	Annual	nd	nd	nd	nd	24.0	nd	23.0	22.0
	Year +	nd	nd	nd	nd	9.0	nd	7.0	9.0

Exhibit 3.2: Aggregate (All Industry) Quantitative Benchmarks
Source: Institute of Business Forecasting, Jain, 2001-2007.

		All Industries							
(Calendar Year)		00	01	02	03	04	05	06	07
9	Production Locked Period	(in percent)							
	One Month	nd	36.9	41.0	46.6	46.0	52.0	41.0	45.0
	Two Months	nd	16.9	13.9	21.4	16.0	13.0	24.0	16.0
	Three Months	nd	18.3	21.4	17.4	19.0	19.0	17.0	20.0
	Three Months +	nd	27.9	23.7	14.6	19.0	16.0	18.0	19.0
10	Forecast Revision	(in percent)							
	Once a month	51.9	54.2	60.0	70.4	68.0	nd	73.0	67.0
	Once a quarter	14.0	18.1	15.9	7.9	7.0	nd	nd	9.0
	Once a year	18.0	9.9	6.4	1.9	3.0	nd	nd	1.0
	Year +	16.1	17.8	17.7	19.8	22.0	nd	nd	nd
11	Monitoring / Documenting Forecast Accuracy	(in percent)							
	Yes	76.6	75.1	71.5	73.0	76.0	nd	83.0	72.0
	No	23.4	24.9	28.5	27.0	24.0	nd	17.0	28.0
12	Incentive in Place to Improve Accuracy	(in percent)							
	Yes	26.7	32.5	31.9	27.0	33.0	nd	34.0	nd
	No	73.3	67.5	68.1	73.0	67.0	nd	66.0	nd
13	Consensus Meetings	(in percent)							
	Yes	78.0	76.3	80.8	83.0	77.0	74.0	83.0	76.0
	No	22.0	23.7	19.2	17.0	23.0	26.0	17.0	24.0
14	Sales and Operations Planning Process (S&OP)	(in percent)							
	Yes	nd	nd	nd	65	62	60	64	70
	No	nd	nd	nd	35	38	40	36	30
15	Collaborative Planning Forecasting and Replenishment (CPFR)	(in percent)							
	Yes	nd	nd	nd	27	39	26	38	43
	No	nd	nd	nd	73	61	74	62	57
Forecasting Methods		(in percent)							
16	Type of Method	(in percent)							
	Time Series	60.0	61.3	63.1	71.0	67.0	68.0	72.0	61.0
	Cause and Effect	24.0	22.7	19.7	19.0	23.0	20.0	17.0	18.0
	Judgmental	8.0	13.9	14.0	10.0	9.0	12.0	11.0	15.0
	Other	8.0	2.1	3.3	0	1.0	0	0	6.0
17	Type of Time Series	(in percent)							
	Averages	18.3	25.1	26.5	27.0	23.0	25.0	24.0	22.0
	Box Jenkins	4.7	7.4	8.1	6.0	8.0	7.0	6.0	7.0
	Decomposition	3.2	8.4	7.0	5.0	6.0	3.0	4.0	6.0
	Exp Smoothing	15.2	23.8	24.7	25.0	28.0	29.0	30.0	29.0
	Simple Trend	19.2	35.4	33.7	38.0	35.0	36.0	36.0	36.0
18	Type of Cause and Effect	(in percent)							
	Econometric	6.8	22.9	22.4	21.0	20.0	16.0	20.0	14.0
	Neural	1.6	8.6	5.2	5.0	3.0	5.0	0	7.0
	Regression	15.9	68.6	72.4	74.0	77.0	79.0	80.0	79.0
19	Type of Judgmental	(in percent)							
	Analog	.69	23.3	19.9	24.0	36.0	38.0	27.0	35.0
	Delphi	2.2	22.1	22.8	16.0	25.0	15.0	15.0	22.0
	Diffusion	nd	nd	nd	4.0	16.0	6.0	6.0	1.0
	PERT	.10	5.8	8.8	13.0	9.0	4.0	2.0	1.0
	Survey	4.6	48.8	48.5	43.0	14.0	37.0	50.0	41.0
Forecasting Error		(in percent)							
20	Error Levels	(in percent)							
	SKU - one month	25.0	27.6	19.9	26.0	26.0	28.0	27.0	29.0
	SKU - one quarter	33.0	28.8	26.6	29.0	30.0	34.0	32.0	33.0
	SKU - one year	21.4	32.7	27.8	30.0	29.0	39.0	32.0	38.0
	Category - one month	18.0	19.3	13.4	17.0	18.0	18.0	20.0	16.0
	Category - one quarter	20.0	18.0	15.8	15.0	19.0	22.0	22.0	22.0
	Category - one year	16.5	21.0	18.8	16.0	21.0	23.0	29.0	27.0

Exhibit 3.2 (Continued): Aggregate (All Industry) Quantitative Benchmarks
Source: Institute of Business Forecasting, Jain, 2001-2007.

		All Industries							
(Calendar Year)		00	01	02	03	04	05	06	07
	Company - one month	12.4	11.0	10.6	15.0	13.0	13.0	17.0	11.0
	Company - one quarter	14.7	10.5	16.4	16.0	17.0	17.0	20.0	20.0
	Company - one year	15.5	11.1	15.4	16.0	16.0	14.0	20.0	21.0
Software and Systems (in percent)									
21	Forecasting Software	58.3	46.1	48.0	64.0	49.0	46.0	44.0	42.0
	Spreadsheet	41.7	53.9	52.1	36.0	51.0	54.0	56.0	58.0
	Forecasting								
22	Forecasting Systems	17.7	13.4	15.2	11.0	7.5	9.0	5.0	3.0
	i2 Technology	20.8	14.9	18.0	16.0	18.0	19.0	18.0	18.0
	Manugistics	14.9	13.4	11.8	11.0	16.8	11.0	9.0	11.0
	Oracle	20.5	20.7	21.1	23.0	20.5	25.0	24.0	24.0
	SAP	26.1	37.7	33.9	39.0	38.0	36.0	44.0	56.0
	Other								
Forecaster Profile (in US\$, 000)									
23	Salary	45	47	49	50	49	50	52	54
	Analyst	54	62	63	62	64	66	68	68
	Senior Analyst	55	71	75	77	77	79	78	79
	Manager	94	105	105	103	111	111	109	111
	Director	129	143	143	144	163	161	156	158
	Vice President								
24	Background	28.4	15.0	12.8	12.9	12.0	14.0	16.0	13.0
	(in percent)								
	Finance/Accounting	16.8	18.9	19.6	18.6	16.0	23.0	24.0	26.0
	Marketing	12.1	11.9	12.6	10.5	10.0	13.0	12.0	9.0
	Sales	16.9	15.8	14.7	13.2	6.0	7.0	8.0	10.0
	Statistics/Maths	11.4	17.4	19.8	25.9	31.0	33.0	31.0	32.0
	Operations	14.4	21.0	20.6	18.9	25.0	10.0	9.0	10.0
	Other								
25	Education	nd	nd	nd	8.0	3.0	5.0	6.0	8.0
	(in percent)								
	High School	nd	nd	nd	50.0	49.0	50.0	52.0	52.0
	Bachelor	nd	nd	nd	33.0	45.0	43.0	41.0	41.0
	Masters	nd	nd	nd	9.0	3.0	2.0	1.0	4.0
	Doctorate								

Exhibit 3.2 (Continued): Aggregate (All Industry) Quantitative Benchmarks
Source: Institute of Business Forecasting, Jain, 2001-2007.

In summary, it is noted the IBF's proffered 'benchmarks' are the result of a series of surveys at fairly consistent intervals with the same target group of respondents polling developments and movements in roughly the same set of 'benchmarks'. This level of consistency has resulted in the presentation above of a longitudinal/time series summary of the 'benchmarks' which makes measurement comparisons more meaningful than the 'snap-shot' or discrete survey variety. Numerous other discrete surveys of a specific or small subset of the seven category IBF 'benchmarks' have been conducted in the past. Sparkes and McHugh (1984) surveyed the opinions of 76 cost and management accountants in the UK with respect to forecasting techniques used some 25 years ago. As previously noted on pages 9 and 13, Mentzer and Cox (1984) conducted a similar survey which polled familiarity, usage and accuracy aspects of techniques used at US firms. Dalrymple (1987) obtained only a 16% response from 134 respondents to a questionnaire addressed to marketing and forecasting managers at 860 US firms. The questionnaire dealt with how the firms prepared their forecasts, the techniques they used and the accuracy they achieved. Sanders and Manrodt (1994) again studied the methods of forecasting used at US firms from the 19% response they received to letters sent to 500 US firms. They also studied why judgmental techniques were so frequently

used. The theme of judgmental forecasting usage was further explored by Fildes and Goodwin (2007) with a survey of 144 respondents at five forecasting conferences conducted in the US and five other corporate respondents. The Fildes and Goodwin survey differed from the four aforementioned surveys in that it was conducted within the framework of a previously established set of forecasting criteria, namely the Armstrong (2001) set of 'principles'. Unfortunately the focus was very narrowly defined to 11 'principles' related to usage, application and value of judgmental forecasting. All of the aforementioned studies have a number of common attributes. As previously stated, they are all discrete studies. They are essentially about the same aspect of forecasting, namely methods of forecasting. Most importantly they are reports of findings to 'one off' surveys and *do not make claim or suggest to be 'benchmarks'*. The only study that ventured in the direction of a 'benchmark' study was Fildes and Goodwin (2007) but even that venture was very limited. As a result of all of the aforementioned characteristics the present study utilizes these works as supplementary, related evidence to the main core of evidence - the IBF's seven category, 25 attribute, eight year longitudinal suite of proffered 'benchmarks'.

3.2 Deconstruction of Western Quantitative 'Benchmark' Literature

The deconstruction of the quantitative 'benchmark' literature will be conducted from two perspectives, initially from a philosophical/qualitative perspective and then from a quantitative/technical perspective.

The IBF proffer the quantitative 'benchmarks' as reflective and/or representative of the "*norms*" of forecasting practice for ten different Western industries with the intent of providing the prospective or current forecasters and/or their manager with a positional beacon (Jain, 2006b: iii). This beacon is intended to illuminate where the firm's forecasting practices currently are or should be relative to the beacon. Upon determination of these positions the assumption is that improvements could, will or should follow in the case of positive positional deviations from the norm. The present study disagrees with the proffer and assumption for a variety of reasons. Firstly, the positional 'norm' does not necessarily guarantee or even portend quality and effectiveness in a forecasting practice. This fallacy of composition does not only afflict forecasting practice but other practices as well. Consider the practice norms of professional female fashion models: "*You should be somewhere between 15 and 22 years old, though probably closer to fifteen. Models don't have careers that last as long as say, doctors, so agencies tend to want to invest their time in someone young. You should be tall, long-legged, and lean. The minimum height is usually about 5'8", and average weight for a model is 108-125 lbs. These characteristics are partly aesthetic and partly practical: this type of frame looks good on the runway and in front of the camera (which, they say, adds 15 pounds); and a somewhat scrawny build drapes clothing nicely and ensures a good fit in the standard wardrobe. There are always exceptions to the rule, of course - Kate Moss is 5'7" and Gabrielle Reece is a giant 6'3" - but, in general, the closer you are to the industry norm, the better your*

chances “ (Anon, 2007). So sayeth the norms of the fashion industry, but they omit to provide the medical industry norm that the very same models weigh 23% less than the weight considered to be necessary to avoid serious health risks (SNAC, 2007). In fact the proliferation of sub 100 pound female models gainfully employed and gaining celebrity are rewriting the norms. But do these rewritten norms portend success in the industry or a booking at the local mental and physical disorder rehabilitation clinic? Similarly, the latest 2007 norm/‘benchmark’ of the average number of forecasters employed by all industries is 4.9, a slight increase from the average the year before. Is this good practice positively correlated with increased forecasting accuracy and effective forecasting practice, a measure of over employment in the practice or a discrete statistic? Clearly it is the latter. Secondly, the positional ‘norms’ proffered are, for the most part, measures of *frequency* rather than *quality* making the determination of good practice difficult. As an example, the 2004 surveys indicate that 140 (49%) of the firms represented at the conferences used electronic spreadsheets to compile forecasts while the remaining 143 (51%) firms used *bona fide* forecasting software packages to generate their forecasts. What do we conclude from these statistics? Are the spreadsheet users missing out on the opportunity to improve forecast accuracy by not taking advantage of the benefits of advances in forecasting software technology or are the software package users needlessly spending a firm’s resources by using software they neither understand how to use or do not provide any better results than an ordinary spreadsheet? Clearly the answer to these questions is that the discrete quantitative statistics should be used, not as standalone measures, but rather in conjunction with qualitative event driven benchmarks such as those detailed in Chapter 2. By following this approach, as the present study does, the quantitative measures become more meaningful, easier to interpret and apply. This applies to those forecasting attributes requiring a qualitative contextual dimension to provide more meaning than a black and white or binary result. Some of the attributes, such as the ‘norms’ of forecasting accuracy levels and salaries, education and background of the forecaster do not require the extra dimension to clarify their meaning as their meaning is empirically self evident. Thirdly, what value does one place in the proffered ‘benchmarks’ bearing in mind the IBF’s survey data sources? The respondents are individuals who have paid a fee to attend a conference. Who are these individuals and what are their qualifications and experience to answering questions related to best practices in the field of forecasting management? The IBF survey asks three questions about the respondent, namely, what is your salary, background and education? Is this sufficient due diligence as to the credibility of the respondent? For a survey of a respondent in a soft drink taste test or a political candidate preference it is, for scientific research and guidance related to the subject of best practices and world class forecasting management practice, clearly it is not. This ‘blind leading the blind’ and the ‘inmates running the asylum’ syndrome sadly is not confined to forecasting management research. The field of legal research suffers the same affliction. *“In the nation's law schools, students decide who among their professors will publish or perish. The students who run the nation's top 20 law reviews gathered at Stanford Law School on Feb. 25-26 to discuss this unusual state of affairs with law professors, lawyers and judges. ‘Never before in more than two centuries of jurisprudence has so much unreviewable discretion been gathered together,’ Stanford law Professor Joseph Grundfest remarked*

as he surveyed the audience of mostly student editors gathered to listen to a panel discussion of the topic "Do the inmates run the asylum?" The title was inspired by the fact that, unlike other academic graduate or professional programs, law turns the decision on what to publish over to its least experienced participants - its students" (Stanford News Service, 1995). Another more universal example of this malady is the internet based Wikipedia touted as the 'biggest multilingual free-content encyclopedia' (sic). What are the qualifications of its research contributors? - a computer and an internet communication connection.

From a technical deconstruction perspective, one has to question the voracity and validity of the IBF's survey research method. The IBF has chosen a quantitative survey research method. As such it is required to follow valid protocols and principles with respect to statistical sampling plans, representativeness and/or generalizability inferences. The 'benchmark' survey samples are non-random and non-stratified, drawn mainly from a pool of respondents from large manufacturers and retailers. No evidence has been presented by the IBF supporting the representativeness of the samples to the population as a whole or to the generalizability of the 'benchmark norms' to the population as a whole. The IBF concedes this point with the respect to the industry data as quoted in Section 3.1. It is silent on the adequacy of the all industry samples and does not publish any evidence or analysis for the researcher to conclude the samples used in the publication of their benchmarks are representative of best forecasting management practices of the Western firm population. In fact the last statistics published by the IBF on sample sizes and industry segment 'norms' was in 2004. At that time the number of respondents was approximately 300 and during the period 2000 to 2004 the IBF conference attendee population has never exceeded 450. These tallies also do not necessarily reflect actual tallies of firm coverage as more than one representative of a single firm may attend the sessions and respond to a survey. Nevertheless to contextualize these tallies, the US Census bureau reports that in 2004 there were 17,047 firms with over 500 employees registered in the USA. Of those firms 4,036 (24%) were manufacturers, 2,272 (13%) were retailers, 2,987 (18%) were wholesalers, 2,878 (17%) were service professionals and 2,123 (13%) were engaged in transportation (US Census Bureau, 2005).

3.3 Literature Review of South African Forecasting Practices

To this point the literature review and deconstruction thereof has focussed on published US, Canadian, Mexican and British studies related to forecasting practices. This section moves the focus to South Africa. Sabinet Online Ltd., an established library and information service provider, list abstracts of 71 articles and studies that have been published in a variety of journals over the last 20 years relating to South African business forecasting activities (Sabinet, 2008a). Similarly, it records 65 unpublished academic studies as having been completed over the last 25 years on the same subject (Sabinet, 2008b). The National Research Council tallied 61 studies for the latter category. Like the Western contributions, the vast majority of these published and unpublished works

focus on methods and formulae not on the overall forecasting practice *per se*. Four contributions amongst this very limited sampling frame are on point with a number of aspects of the present study. All the contributions hail from the University of the Witwatersrand Business School (WBS). Three studies were conducted by students and one by faculty based in part on the work of their students. Kaye (1985) conducted an MBA prerequisite study on the topic of forecasting practices in large RSA firms. The study employed a quantitative mail survey method. Questionnaires were sent to the Managing Director (MD) of all firms listed on the JSE, a total of 535 firms. The MD was requested to have the 30 question instrument “*filled out by the person most responsible for the preparation of forecasts and by the person most responsible for the use of those forecasts.*” 62 responses were received. 28 (45%) from forecast preparers, 23 (36%) from forecast users and 11(19%) were both. In essence 31 firms were polled from a population of 535, a response rate of 5.8%. Kaye reported, *inter alia*:

- 1) 70% of the sample firms employed less than 3 people to perform forecasting functions despite their large overall sizes – 60% of the sample employed over 2,000 people.
- 2) 80% of the sample reported they produce formal forecasts.
- 3) 70% of the sample claimed accuracy results of less than 10% for ‘regularly prepared forecasts’ for production planning purposes. 5% of the sample reported errors over 20%.
- 4) Subjective methods were used in preference to technical methods.
- 5) 90% of the sample used computers to aid their forecasting but only half of the computer users ran forecasting software on their machines.
- 6) 95% of the preparers have had no formal training in statistics or management science.
- 7) Users and preparers displayed different perceptions of each other’s abilities.
- 8) All respondents believed forecasting importance in corporate planning would not decrease in the future with 65% of the sample believing it would increase in importance.
- 9) Despite sample firm size differences relative to the sizes of the firms in comparable US and UK surveys, there were few differences in the practices adopted in each country.
- 10) The Finance Manager was most frequently responsible for forecast preparation

Kaye concluded one key way to improving the effectiveness of the forecasting function is better ‘training’ of the practitioners. Wilson (1987) followed Kaye with a similar MBA prerequisite study. This study surveyed (via a mail questionnaire to the MD) *The Financial Mail’s* Top 100 firms. The focus of the survey was the role econometric modelling played in the firm’s forecasting and planning processes. 50 firms responded to the survey. While econometric modelling falls into the technique/method/formula *genre*, it was reviewed as the work touched on forecasting and planning practices of RSA firms. It also covered areas cited in a subsequent contribution which is directly on point with the present study. The Wilson study concluded, *inter alia*, that econometric modelling usage, as part of the forecasting and planning processes, was widespread in South African commerce and industry. A number of specialised institutions and firms service the needs of the widespread users across different industries. Outfits focussing on forecasting exchange rates,

which is an important variable in the South African business setting, were deemed of value. South African firms surveyed recognised the practice of forecasting was a very risky venture and that formalised processes and techniques were needed to meet this challenge. Econometrics was viewed as meeting the technique need. Utilizing the groundwork research of their MBA students, Yeomans and Bendixen (1988) published a solitary South African contribution on domestic business forecasting practices in the now defunct *'The Statistician'* journal. The study reports four topics: (1) a proffered definition and process of business forecasting, (2) 'forecasting complexity in South Africa', (3) practices in South Africa illustrated by sample case studies of domestic firms and (4) conclusions derived from the study. Yeomans and Bendixen offer the following definition of business forecasting: *"Business Forecasting is an interpretative process, founded on the most relevant and widely based knowledge obtainable and utilising any analytical techniques and methods able to produce clearer images of what has happened in the past, designed to predict likely outcomes in the future."* They operationalise this definition by calling upon time series and econometric methodologies to identify and extrapolate economic and business regularities and interact with qualitative methods which are assumed to capture the irregularities. A synthesis of these methods together with management judgement and experience produce 'working forecasts' according to the Yeomans and Bendixen process. Reconciliation of the working forecasts with the firm's goals, targets and objectives may require modification of the firm's policies. Monitoring and control is the final step in the process. Comparison between actuals and forecasts is expected to influence future corrective behaviour in the preparation of the working forecasts and determination of the firm's goals. This process is shown in Exhibit 3.3:

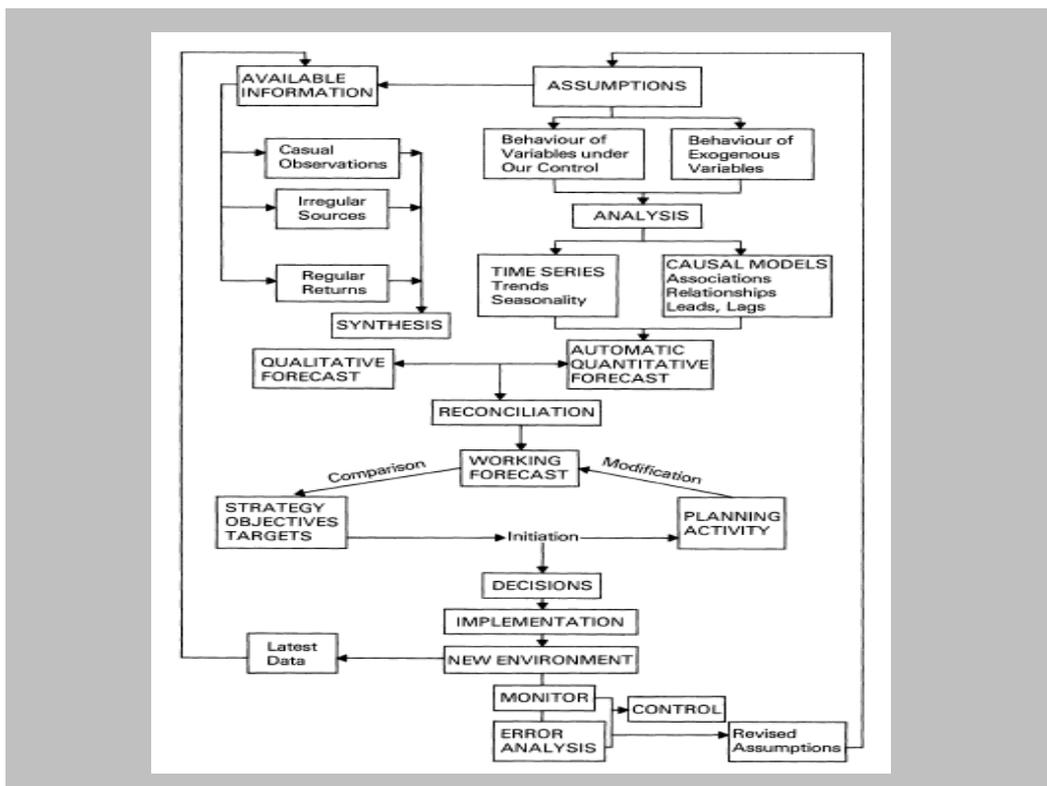


Exhibit 3.3: Yeomans and Bendixen RSA Forecasting Process

The second section of the study laments a list of macro and socio-political conditions the RSA corporate forecasting practice faced *circa* 1988. As most of these items are now passé and the remaining ones debatable, even at that time, an exposition will not be conducted save to say the point the authors were attempting to convey was their opinion that the practice of forecasting at the best of times is difficult and at the worst of times potentially insurmountable. The third section of the study was a regurgitation of the Kaye (1985) and Wilson (1987) studies discussed previously. The authors report their students' studies validated their own consultancy experiences with a number of RSA firms concluding: *"It is clear that the academic research and curricula in many university mathematics/statistics departments and the business schools is not perculating (sic) out to the business community."* The third section presents case studies of two domestic institutions namely, the Chartered Accountants (S.A.) Medical Aid Fund and the Electricity Supply Commission (ESCOM). The medical aid case demonstrated the application of univariate Box-Jenkins models. The second case, the work product of another MBA dissertation, Joubert (1986), demonstrated the application of Box-Jenkins transfer function models at ESCOM. Both cases are fairly unremarkable in the context of the present study. The brief concluding section of the study viewed South African forecasting practices *circa* 1988 as *"one of contradictions"* in the sense that RSA firms recognise the importance of excellence in forecasting practices yet *"the range of skills and knowledge brought to bear on the problem ranges from the simplistic to the complex."* Yeomans and Bendixen believed the educative process had an important role to play in reconciling this paradox and that their institution was actively engaged at the forefront of meeting this challenge due to its self-perceived esteem and political correctness within the Southern African business community. Chapter 6 assesses the outcome of this perceived active engagement. The final RSA contribution to be reviewed is Nunberg (1990) another MBA prerequisite study. Nunberg's research approach consisted of mailing a 46 question instrument to a randomly selected sample of 132 firms, from 20 different industries, out of the population of roughly 560 publically traded firms listed on the JSE. Three respondents, the Managing, Finance and Marketing directors, were targeted with each receiving the same questionnaire. The rationale behind multiple respondents was to test response consistency from the senior management with respect to their knowledge of forecasting practices at the firm. 62 (47%) of the firms returned a usable response and 20 (15%) firms responded as non-participants. No firm agreed to have multiple responses to the same survey and only 10 firms agreed to have two responses. Nunberg believed the information obtained from the 62 firms was representative of the opinions of the other roughly 400 firms listed on the JSE. Conclusions and/or findings of the study were:

- 1) Forecasting is viewed as an important component in the decision making process yet knowledge of forecasting techniques, applications and implementation is limited.
- 2) There is a low level of and inadequate commitment to the forecasting function with practices being informal and non-procedural.
- 3) Insufficient action is taken to reduce forecasting errors and no post-mortem procedures and/or corrective feedback is in place to correct potential future errors.

- 4) Despite most senior managers holding academic degrees indicating they had received formal training in quantitative forecasting methods, simple qualitative methods were used on the job.
- 5) The type of forecasting most practised was operational and profit planning forecasting.
- 6) Responsibility for forecasting was most frequently placed within the finance function of the firms.
- 7) Despite the recognition of the important role proper forecasting practices have in the firm, managers are confused and stymied as to what they are and how to implement them.
- 8) The need for better forecasting managers and practices will increase in the future.

3.4 Deconstruction of South African Practice Literature

The WBS studies adopted a quantitative mail-in survey method of inquiry and thus the research conclusions reached are based upon the quality and validity of the information harvested. The Kaye (1988: 30) instrument consisted of 30 structured questions, the answering of which was timed at 15 minutes in the pilot studies conducted. 62 responses from 31 firms were received – a firm response rate of 5.9%. The sample firms were large by RSA standards employing over 2,000 people. In sum, 62 respondents expended an approximate total of 16 hours transfusing the informational life blood to the Kaye study. The Nunberg (1990: 58) instrument consisted of 46 questions pilot tested to take 25-35 minutes to complete. 72 responses were received from 62 firms. Nunberg thus predicated his conclusions on a total of approximately 36 hours of respondent deliberations. Was the level of due diligence conducted in these studies sufficient to be drawing valid conclusions about the state of forecasting practices at RSA firms at that time? To answer this question both qualitative and quantitative elements of the due diligence need to be considered. With respect to the latter, Moon *et al.* (2003: 17) indicated to obtain a proper and full understanding of the state of a firm's forecasting practices they conducted face to face interviews of approximately 45-60 minutes. The number of interviews they conducted for their study averaged 32 with a range of 22-64. Their studies were also of large firms, 36 in total. In sum, the Moon *et al.* (2003) study devoted an average of 29 hours *per firm* to collecting and qualifying vital study data. It would appear deconstruction has identified the two extremes on this question. However, Mentzer *et al.* (2006) provide a moderate and less contentious guiding answer based on the experiences of two past studies namely, the Mentzer and Cox (1984) survey of 160 US firms and yielding a 32% response rate and the Mentzer and Kahn (1995) survey of 208 US firms and yielding a 43% response rate. Most of 208 firms were the same firms from 10 years prior.

These studies were very similar in focus to the WBS studies and constituted what Mentzer *et al.* referred to as 'Phase 2 of the benchmark studies'. Mentzer *et al.* concluded: "*I wonder what the respondent meant by that answer? Equally often, the comment was made, 'It would be great to be able to ask a follow-up question so we could really understand how this company manages this*

aspect of forecasting. ' We were finding that, although Phases 1 and 2 yielded a wealth of information about the forecasting practices of several hundred responding companies, it also generated a great deal more questions that we wanted answered.' (Mentzer & Moon, 2006: 253). Phases 3 and 4 of the 'benchmark' and 'audit' studies switched from quantitative surveys to face to face interview qualitative methods of inquiry to get the insight they believed necessary to properly understand the practice. This published experience raises a related question already brought to the fore in the case of the IBF 'benchmarks' namely, who were the actual respondents who provided Kaye and Nunberg with their answers? Kaye mailed his questionnaires to each firm's MDs with the request the MD choose the person 'most suitable'. Nunberg did likewise only including the FD and the Marketing Director on the mailing list. Neither Kaye, Nunberg nor Wilson knew exactly who actually completed the survey or what that person's qualifications were to complete a survey of this nature. Mentzer and Kahn faced the same quality of respondent issue. Their questionnaire was directed to the "person responsible for the forecasting function." Mentzer and Kahn suggest that test was passed because "a review of business cards with survey responses confirmed that surveys were completed by forecasting managers." Fortunately, occupation is not axiomatic of credibility. In sum, the WBS MBA studies provide a rough and 'unaudited' opinion as to the 'what, who, when, how much and how many' but not the 'how and why' questions related to RSA forecasting practices circa the five year period of 1985 to 1990.

Yeomens and Bendixen (1988), utilizing the data collected by their students and drawing upon their own consultancy experiences, attempt to piece together the 'how and why' of the practice. Exhibit 3.3, their depiction of the typical industrial forecasting process, is fairly consistent with published contributions on the same topic depicted in Section 2.2 and as such is of comparative and longitudinal value to the present study.

3.5 Chapter Summary

The chapter continues the review of forecasting practice analytic categories by conducting an extensive and intensive review of Western quantitative 'benchmark' literature. Consistent with the studies' research strategy this literature is not to be accepted *carte blanche*, instead it is required to be deconstructed which entails a critical review and a cull in search of credibility and relevance. Following the review of Western quantitative literature, the focus is switched to South African published and unpublished contributions in the field of business forecasting practices. These contributions are reviewed under the quantitative literature section as the orientation of the studies is predominately quantitative survey type studies. These studies are thoroughly deconstructed and culled of irrelevant, questionable and unreliable information. This chapter ends where it began with the Cartesian tenet that when it is not in one's power to determine what is true, we ought to follow what is more probable. This *discours de la méthode* was used in this and the previous chapter and filters into the next step of the study research strategy namely, the review of the cultural categories and interview design

Chapter 4 Review and Discovery of Cultural Categories

*"If you know your enemy and know yourself
you need not fear the result of hundred bat-
tles." (Chinese General Sun Tzu -500 BC)*

4.1 Familiarization and Defamiliarization

Step 1 of the 'Long Interview' research strategy was to discover what others in the West and in South Africa know about business forecasting practices. Step 2, the review of cultural categories, entails investigating what the study instrument of inquiry knows about the topic. The study instrument of inquiry is self, in stark contrast to the quantitative survey approach in which the instrument is a wad of paper with questions written on it. The intent of this step of the research strategy is to harness the potentials of self with the expectation this instrument of inquiry possesses an "extraordinary intimate acquaintance" with the study topic. As previously stated in Section 1.5, should this expectation be fulfilled, the investigator thus possesses a "fineness of touch and delicacy of insight that few ethnographers working in other cultures can hope to develop" (McCracken, 2008: 32).

Self was educated in South Africa in business and economics, thereafter in finance and econometrics in the USA. The aforementioned subjects were then taught by self at graduate and undergraduate levels at a USA business school for three years. Teaching was followed by 25 years of practice as an economist, industrial forecaster and management consultant. This tenure consisted of four years as Corporate Economist for a \$3 billion US publically listed electronics firm, three years as a consulting director for a 'big six' global accounting and management consulting firm and 18 years as Managing Director of a privately owned US based forecasting consulting firm. During this tenure, a mix of over 125 discrete and longitudinal forecasting projects and/or consultations were personally conducted in the USA, France, the UK, Germany, Italy, Japan, Hong Kong, China and South Africa. Many of the longitudinal projects extend over five years. The meeting of personal pecuniary goals has resulted in practice semi-retirement and a change of challenge focus to scientific research in the area of business forecasting and associated practices. Cultural categories of business forecasting that have emerged during this practice journey are *inter alia*:

- 1) A firm's disposition and/or attitude to the practice of forecasting. Does the firm as a whole view forecasting as a necessary evil, a sought after, potentially valuable asset or a despised mystery that is best ignored or relegated to the status of a firm's ignominy or private odious secrets?
- 2) The disposition and/or arrogance of the leader of the firm towards forecasting. Does the MD/CEO/President believe he/she personally has as much information about the future of

his/her firm that is needed and the forecasts of others in the firm are to be filed under ‘interesting’? Or does the MD/CEO need and/or rely on the forecasts that come from the ‘troops’? If so is the MD/CEO willing to expend the effort and money to improve the practice or does the MD/CEO even know there is a problem?

- 3) The marginal productivity calculus of the firm. Is incompetent forecasting viewed as a cost of doing business (à la US tobacco firms and lawsuits), where the marginal costs of poor forecasting practices are less than the marginal benefits of improved forecasting? If the opposite applies, is there a manager in place to champion the cause of improvement?
- 4) The ‘make’ versus ‘buy’ calculus of the firm. Is it more profitable and efficient for the firm to invest in hiring a professional forecaster and establish an entire department to do their forecasting ‘in-house’ or is it more profitable to outsource the whole lot to a firm of veteran forecasters? Is the firm qualified to perform the necessary mathematics or does it need to hire a consultant to determine if it needs to hire a forecasting consultant?
- 5) The forecasting divorce decision. If the firm is dissatisfied with the quality and results of its present forecasters is it more profitable to invest in re-educating and/or re-training them or is it more profitable to fire the lot and hire a new group and start from scratch? If so is the firm sufficiently endowed to make an objective decision or will it be an emotional one?
- 6) Corporate courage. Does the firm and/or its leader have the courage and fortitude to face the challenges, risks and losses resulting from poor forecasting practices and make the difficult decisions? Can the firm recognise its forecasting ‘fakers’, ‘mediocres’ and ‘empty suits’ and are they prepared to make changes? Are they prepared to stand up to external investors and boards when faced with forecast goals not based upon market and economic conditions rather, external analyst and ‘street’ expectations?

The aforementioned forecasting cultural categories of attitude, arrogance, risk, profit, divorce and courage have been identified from self experience and are consistent with one of the purposes of the cultural review namely, to identify cultural categories *not* identified in the scholarly and applied literature. Mundane forecasting cultural categories identified by the literature are subsequently listed for due diligence purposes:

- 1) Relationships (between the protagonists).
- 2) Support (labour, capital and intellectual).
- 3) Success (measurements and dimensions).
- 4) Conduct (methodologies and processes).
- 5) Rewards (compensation and bonus).
- 6) Esteem (qualifications, background and experience).
- 7) Recognition (standards and benchmarks).
- 8) Organisation (top-down vs. bottom-up)
- 9) Politics and Conflict (supply vs. demand, marketing vs. finance)

10) Maturity (forecaster, manager, director, vice president).

With the above cultural inventory brought to the fore, the next action that needs to be taken in the cultural review is to “*root these out of the terra firma of familiar expectation.*” In other words the next step is to prepare to create distance by ‘defamiliarization’. This step is a particularly difficult step in the protocol as it requires the investigator to selectively turn his or her forecasting experience memory bank on and off. The bank must be turned on to make sure the respondent is not providing unreliable noise, obfuscation and falsehood. The bank must be turned off when the words and utterances the respondent uses may be paraphrased with a familiar term in the investigator’s experience so as to avoid interpretational bias or reflexivity. One in effect has to simultaneously interview with a split personality, a veteran forecasting consultant and a trained ethnographer or industrial psychologist. In this study the former is achievable while the latter is a big challenge. To address this challenge a simple process was applied during the interviews named ‘labelling’. When the respondent provided a description or a sequence of utterances, he/she was asked to provide a one or two word label or paraphrase of the concept or issue. This was done *after* the note of the same concept issue was made by self. The labels were compared later and significant differences were examined for reflexivity.

4.2 Interview Plan Construction

The third step of the research strategy involves the discovery of cultural categories. The cultural categories are discovered during the interview process. Key to the success of the interview and discovery process is the depth and scope of the questions and topics that will be asked and discussed. Mentzer *et al.* (1999) and Moon *et al.* (2003) addressed this issue through the use of their ‘audit protocol’, market researchers utilize ‘discussion guides’ and McCracken, perhaps inconsistently refers to a ‘questionnaire’. This is inconsistent as McCracken takes great pains to differentiate the study research strategy from the quantitative *genres* of social inquiry. Questionnaires are synonymous with quantitative surveys, not qualitative open-ended ethnographic interviews. This study refers to the list of interview questions and discussion topics as the interview plan or IP.

The principle analytic categories of this study are the forecasting practices of RSA and Western firms and the standards and/or benchmarks associated with those practices serving as a contextual frame. Thorough coverage of both and in particular the benchmark category is required in the interview plan. From the literature review the IP is offered the IBF’s quantitative ‘benchmarks’, Mentzer *et al.*’s ‘dimensional characteristics’, Fildes and Hastings’ aspects of an organization’s response’, Armstrong’s ‘pitfalls and principles’ and Schultz’s ‘profile factors’. It would appear the simple and swift approach would be to include all of these in the IP and get on with the interviews. In fact, Winklhofer in her critique of Moon *et al.* suggests as much: “*The authors state that they have identified only three frameworks to serve as standards against which forecasting processes*

can be compared. Instead of integrating all three and developing an all-encompassing one, the authors have chosen to follow the one developed by Mentzer, Bienstock and Kahn (1999).” However, the bar of the present study requires a higher level of due diligence. Specifically, what are ‘benchmarks’, ‘best practices’, ‘world class’ and other like terms so liberally used in the literature? Terminology and definitions range from short and simple such as: “*Benchmarking is learning from the pros*” (ASTD, 1992) to complicated and verbose: “*benchmarking is the art of finding out-in a completely straightforward and open way-how others go about organizing and implementing the same things you do or that you plan to do. The idea is not simply to compare your efficiency with others but rather to find out what exact process, procedures, or technological applications produced better results. And when you find something better, to use or copy it-or even improve upon it still further*” (Harris, 1995). Proper understanding of the origin, sequence and essence of these concepts required a sequitur approach. The American Productivity & Quality Center (APQC, 2007), a non-profit think tank on the subject, provides the following glossary:

- 1) Benchmark - “A measured, ‘best-in-class’ achievement; a reference or measurement standard for comparison; this performance level is **recognized as the standard of excellence** for a specific business process.” (Emphasis added).
- 2) Best in class – “Outstanding process performance within an industry; words used as synonyms are best practice and best-of-breed.”
- 3) Best practice – “There is no single “best practice” because best is not best for everyone. Every organization is different in some way--different missions, cultures, environments, and technologies. What is meant by “best” are those practices that have been **shown to produce superior results; selected by a systematic process; and judged as exemplary, good, or successfully demonstrated**. Best practices are then adapted to fit a particular organization.” (Emphasis added).

The criteria:

- 1) Recognized as the standard of excellence
- 2) Shown to produce superior results
- 3) Selected by a systematic process
- 4) Judged as exemplary
- 5) Successfully demonstrated

may be considered to be the benchmarks of benchmarks. In fact, Robert Camp, the logistics engineer who directed the benchmarking programme for the Xerox Corporation, (the US firm credited with the private sector origin of the practice), raises the legitimacy bar even higher by citing to the Japanese word “*dantotsu*”. There is no equivalent word in the English language but the connotation is the “*best of the best*” (Camp, 1989: 3). Armed with these criteria a review of the literature proffered ‘benchmarks’ is beneficial to the development of the IP.

The IBF’s proffered and marketed quantitative benchmarks are published without any evidence of criteria 1, 2, 4 and 5 above. To the contrary the IBF state the source of their ‘benchmarks’ are at-

tendees at “*best practice conferences*” who may be forecasters or are planning to become forecasters. How can the latter be considered ‘pros’ or *dantotsu*? The data obtained from these conferences are at best forecasting average measurements of staff groups from large manufacturers or retailers without any evidence or assurances these averages measure best practices. For the above reasons the IP utilizes the IBF’s information as longitudinal measures of the ‘who’, ‘what’, ‘how many’ and ‘how much’. The IBF’s ‘benchmarks’ are nothing more and nothing less than *metrics-in-use*. As to the ‘how’ and ‘why’ standards of excellence other sources will be used. The contributions of Armstrong and Schultz are not proffered or marketed as ‘benchmarks’ rather as a suite of ‘dos, don’ts and look fors’. The IP takes notice of these offerings. Fildes and Hastings offer ‘aspects of an organization’s response’, an ‘idealized forecasting system that can serve as a diagnostic tool for identifying potential distortions’ and a ‘model of the forecasting activity’. The offering attempts to answer ‘the how’ and ‘the why’ of forecasting practices and suggests elements of best practice. It does not offer any evidence of the ‘aspects’, ‘system’ or ‘model’ meeting benchmark criteria 1, 2, 4 and 5. Watson (1996) did however adopt aspects of the offering in a study of the Scottish electronics industry. Hughes (2001) then extended the work of Watson to the UK financial services sector, mainly a sample of banks and building societies. No further published adoptions of the Fildes and Hastings contribution has been uncovered by a best efforts search. The IP therefore does not adopt the Fildes and Hastings contribution as a set of widely used benchmarks, rather as a valuable insight into the practice of a large UK manufacturing firm. Subject to the deconstruction presented in Section 2.4, this contribution is utilized as a *theory-in-use*. Mentzer *et al.* (1999) proffer their ‘dimensional characteristics’ as *bona fide* benchmarks and Moon *et al.* (2003) their audit framework as a *bona fide* benchmark comparison instrument. Conflicting evidence is published as to the forecasting performances and abilities of the firms studied. As previously discussed in detail in Section 2.3, Mentzer *et al.* (1999) describe the studied firms as models of financial performance but not necessarily models of forecasting performance. Moon *et al.* (2003) contend that the Mentzer *et al.* (1999) firms are models of forecasting performance but offer no such evidence. Similarly, in rebuttal to peer review, Moon *et al.* attempt to address the causality of their audit recommendations based upon their ‘benchmarks’ with improved forecasting performance. On the one hand Moon *et al.* in Fildes *et al.*, (2003: 39) contend: “*we did provide qualitative information on companies that have implemented the audit findings and have improved their forecasting performance*” yet readily also admit that a number of firms did not follow their recommendations. The firms that did not follow their recommendations are placed into the ‘*assign the blame category*’ and ‘*why should I care?*’ category. Moon *et al.* are silent as to the outcomes of these firms and their forecasting performance. Did they also improve their forecasting performance on their own without following these recommendations or did their forecasting performance deteriorate or was there no change? By not addressing this issue Moon *et al.* present other researchers with an apparent double standard. It is reasonable to call upon Moon *et al.* to reconcile these contradictions and double standards. On the issue of proven causality, application of Charles Ragin’s Qualitative Comparative Analysis (QCA) based upon Boolean algebra would leave the researcher in no doubt as to existence and direction (Ragin, 1987). Until such time as Moon *et al.* provide this level of

evidence or proof it is questionable as to whether the audit platform and the dimensional characteristics upon which they are based meet the bar of benchmarks. On the issue of replicability, a best effort search revealed that despite the very public calls by Moon *et al.* for other researchers to adopt their approach, only one other study outside of the portals of the University of Tennessee, using their benchmarks, appears to have been conducted. Green (2001) explored the sales forecasting process of seven southern USA restaurant firms in an unpublished doctoral dissertation in hospitality and restaurant management at the Virginia Polytechnic Institute. The Green study accepted Mentzer *et al.* unreservedly despite adopting the McCracken *Long Interview* protocol *sans* deconstruction. Mentzer was a member of her doctoral review committee. Green and Weaver (2005) published an abbreviated version of the same study. For the purposes of the IP the Mentzer *et al.* 'benchmarks' and the Moon *et al.* audit framework are considered as valuable and insightful theories-in-use or in practice parlance, PCPs - parochial consultant's platforms. In fact Bretschneider stated in the peer review: "*The stated goals of the paper read more like a consultant's report or an advertisement*" and "*Unfortunately this paper continues in the tradition of making prescriptions based on simple observations, common sense and intuition, all admirable and appropriate for consultants, real world managers, and the beginnings of a research process but not where we need to end up.*" Similarly, Winklhofer concludes: "*On a final note, the auditing instrument proposed has been designed for large organisations and the methodology suggested is directed towards external consultants performing the audit.*" Summating these views one may get the impression consultant findings derived from factory floors should be viewed with less import and respect than theories developed in academic colloquia. The present study takes no such view. Instead the view that PCPs provide valuable data, insight and more importantly access to the forecasting cultural categories is adopted.

To this point the study IP construction may be influenced and guided by the IBF's metrics-in-use, Armstrong's principles, Schultz's factors and two theories-in-use, one from Fildes and Hastings and the other from Mentzer *et al.* and Moon *et al.* All of these sources and offerings have one attribute in common from the perspective of the present study and other third party researchers namely, they are secondary research. As previously stated in Section 1.4 the present study accepts the *bona fides* of the researchers involved but at the same time is put at a serious disadvantage by not knowing the identities and forecasting abilities of the firms and individuals surveyed and/or interviewed that influenced the determination of the offered 'benchmarks'. In short, the critical benchmark question of *dantotsu* is not addressed or sufficiently evidenced in the extant literature. To overcome this disadvantage and shortcoming the study draws upon Type 4 evidence unveiled in Section 1.5. Type 4 evidence is the product of 20 years of primary research with the identities, forecasting abilities and forecasting successes and failures of over 40 Western firms clearly known, monitored and studied. Most importantly however, *dantotsu* can be clearly identified to meet the bar of benchmarks. Accordingly, as stated previously, where there is a discrepancy between the published secondary research offerings and the primary research *dantotsu* the protocol of

the present study is to alter, amend, append or substitute the latter for the former in the compilation of the study benchmarks and the IP discussion points.

4.3 Interview Plan Discussion Points and Benchmarks

The reconciliation of the primary and secondary research entails utilising the strengths and culling the weaknesses from each source. The product of this procedure will result in:

- a) the creation of an amalgamated forecasting process to be used not only as a benchmark itself but more importantly as an analytical and contextual framework for all other benchmarks. This process is an essential element of forecasting best practices and provides a higher value of significance to each qualitative benchmark by virtue of the contextual setting it provides. This will constitute the forecasting process section and discussion points of the IP.
- b) the creation of an amalgamated set of Western qualitative benchmarks and quantitative criteria to be used to assess the practices of the South African firms interviewed in this study. This will constitute the quantitative and qualitative discussion points of the IP.
- c) the creation of a diagnostic protocol to be used during the interviews of the forecasting respondents of the participant South African firms. This will be consistent with the deployment of ‘floating and planned prompts’ and the utilization of auto-driving techniques *The Long Interview* protocol recommends.
- d) the *de facto* presentation of the present study’s offered contribution to the management science of effective and productive business forecasting practices.

The amalgamated best practices forecasting process proffered consists of a three stage, two dimensional, ‘closed loop’ or recursive, integrated process. The three stages consist of the Forecast Development stage, the Forecast Implementation stage and the Forecast Quality Control stage. The two dimensional nature pertains to the forecast development stage where forecasts are developed at an endogenous (within the firm) and an exogenous (outside the firm) level. The forecast development stage in turn consists of five separate sub-stages. The first is the independent development of bottom-up, endogenous, objective forecasts by a competent (trained, educated and experienced in forecasting) manager or analyst. These objective technical forecasts are generated using primarily time series methods. The second sub-stage is the independent development of bottom-up, endogenous, subjective forecasts by marketing and sales personnel or by the firm’s customers. These forecasts are co-ordinated by a competent forecast manager or analyst. The forecasting methods used in the subjective forecast development consist mainly of qualitative approaches such as sales force composites, juries of opinion, conjoint analysis and field and market surveys. Sub-stage 4

entails the development of top-down, exogenous, objective forecasts by a competent forecast manager or analyst. Methods used in the development of the latter forecasts are mainly cause and effect techniques such as regression, econometric and neural approaches. Once all three types of forecasts are generated, a forecast manager reconciles differences and integrates the reconciled forecasts into the firm's functional areas. A key element of this reconciliation and integration exercise is the presentation to, acceptance of and adoption of the forecasts by the firm's senior management. Stage 1, the Forecast Development stage is diagrammatically shown in Exhibit 4.1:

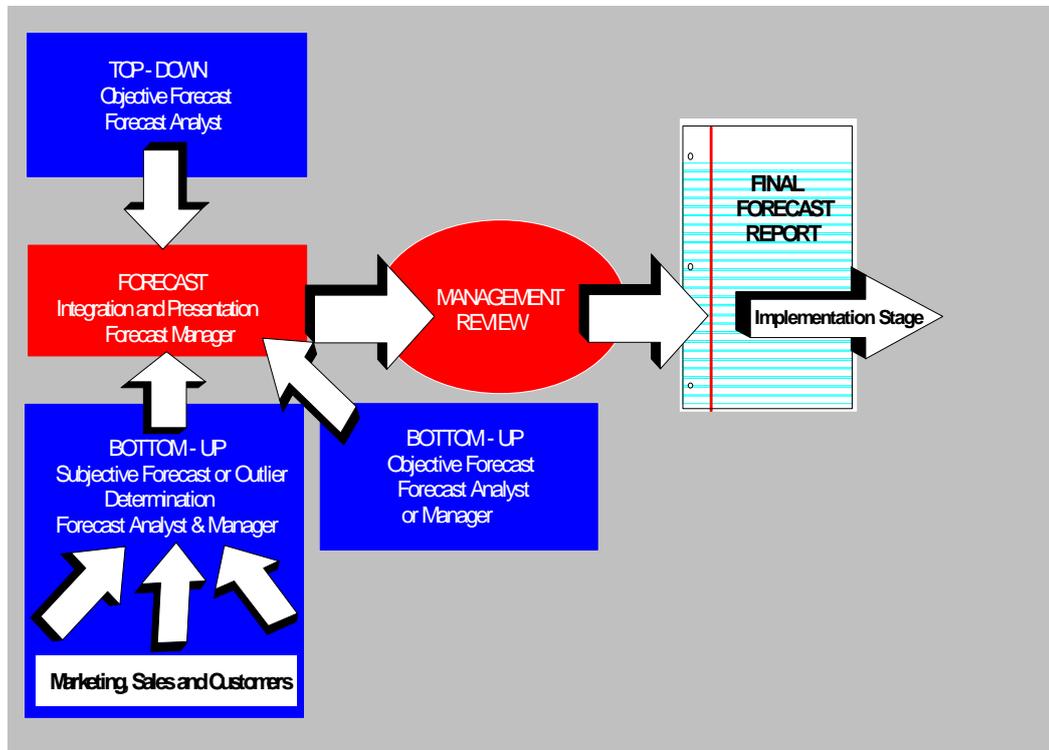


Exhibit 4.1: Forecasting Process Stage 1 – Forecast Development Stage

Once the management acceptance and adoption hurdle has been overcome the forecast manager issues a final forecast report and ushers the forecasts onto the next stage of the forecasting process, the Forecast Implementation stage. This stage represents an important qualitative benchmark in the forecasting process namely, testing if firms actually use the forecasts they expend significant time, energies and resources in developing. Makridakis (1982) states: *“Forecasting often has little impact on decision making. This may be caused by lack of relevance of the forecast – in terms of what, when and how, and in what form such forecasts are provided. The problem may also be interpersonal as when those who prepare the forecasts and those who use them fail to communicate effectively.”* Makridakis proffers scenarios where honest intentions cause potentially valuable forecasts not to be used. Practice however, also illustrates darker motives for these phenomena to occur. It is not unheard of for a forecaster to travel through the Forecast Development stage and present a true market based customer demand forecast only for the operations wing of the firm to produce quantities and product mixes more convenient and profitable to the factory cost centre rather

than marketing or corporate profitability. More common is for true market demand forecasts to be met by lesser, factory constrained supply quantities as the production wing of the firm does not wish to take the risk of adding capacity to meet the demand forecast as they either do not want to expend extra effort or do not believe the forecast. Conversely, the production wing of the organization may provide forecasts that require a significant dose of the forecasting cultural category of management courage and capital investment to meet future customer demand only to find the latter sadly lacking. ‘Agenda gaming of the system’ is frequently observed in practice. Makridakis made his impact point in 1982. The Yeomens and Bendixen (1988) contribution quite ironically illustrates an elaborate Box-Jenkins model utilized by the South African Electricity Supply Commission (ESCOM) at the time of their study. This model is shown in Exhibit 4.2:

Methodology. Box-Jenkins transfer function modelling is used to estimate the parameters in the following loglinear stochastic dynamic model of demand given its price:

$$\ln V_t = \mu + v_0 \ln P_t + v_1 \ln P_{t-1} + \dots + n_t$$

where V_t is demand and P_t is price of the commodity at time t ; n_t is the noise process and v_i the impulse response weights. The function $\varepsilon(k)$ of lag k is the dynamic price elasticity defined as:

$$\varepsilon(k) = \sum_{\tau=0}^k v_\tau \quad K=0, 1, 2, \dots$$

The limit of ε as k tends to ∞ is defined as the total price elasticity of demand (see Leskinen & Terasvirta, 1976.)

Models. The following transfer function models were developed for the price-demand relationships for the four customer categories (note all parameters are significant at a 95% confidence level):

Bulk:

$$(1-B) \ln V_t = 0.9036 + \frac{(1-0.2735B-0.2259B^2)(1-0.2284B^{12})}{(1-0.2657B^{12})} e_t$$

Industrial:

$$(1-B) \ln V_t = 11.18 - 0.1982 (1-B) \ln P_{t-19} + (1-0.6273B)(1+0.1911B^{24}) e_t$$

Mining:

$$(1-B) \ln V_t = 0.2165 + (0.1112 - 0.1409B)(1-B) \ln P_{t-16} + \frac{(1-0.7050B)(1-0.1747B^6)}{(1-0.5861B^{12})} e_t$$

Traction:

$$(1-B) \ln V_t = 0.0728 + (-1.4427 + 1.2916B)(1-B) \ln P_{t-15} + (1-0.7140B)(1+0.2489B^{12})(1+0.2783B^{24}) e_t$$

(Demand in GWh, price in cents per kWh.)
The price elasticities of demand derived from these models are as follows:

Category	$\varepsilon(\infty)$	Pure delay
Bulk	0	—
Industrial	-0.030	16 months
Mining	-0.198	19 months
Traction	-0.151	15 months

Exhibit 4.2: ESCOM Forecasting Model

In 2007 and 2008 Southern Africa and particularly South Africa had been subjected to the local euphemism of ‘load shedding’ or more commonly known as ‘blackouts’, culminating in major mining firms shutting down operations because ESCOM could not meet demand. Was this due to Box-Jenkins failing, lack of durability of the method or other factors? The country’s leader, holding an undergraduate economics degree from the University of London and a Master’s in economics from the University of Sussex answers the question thus: “When Eskom said ‘We must invest more in terms of electricity generation’, we said no. We were wrong. Eskom was right” (Ngqiyaza, 2008). The lesson learned from this and like examples is that **accuracy is not axiomatic of execu-**

tion. It is for these reasons and others the Forecast Implementation stage is of vital importance in determining and evaluating effective forecasting practices. If firms do not have this stage, take this stage for granted or ignore this stage, their forecasting practices are deficient. This stage features prominently in the present study as it provides a mechanism to ensure a demand forecast is met by demand quantities, a supply forecast is met by supply quantities, an earnings forecast prompts the firm to take the necessary actions to achieve those earnings and a cash flow forecast prompts fiscal conduct to ensure the forecasted cash balance is achieved. This *de facto*, forecast in, forecast out mechanism is flow-charted in Exhibit 4.3:

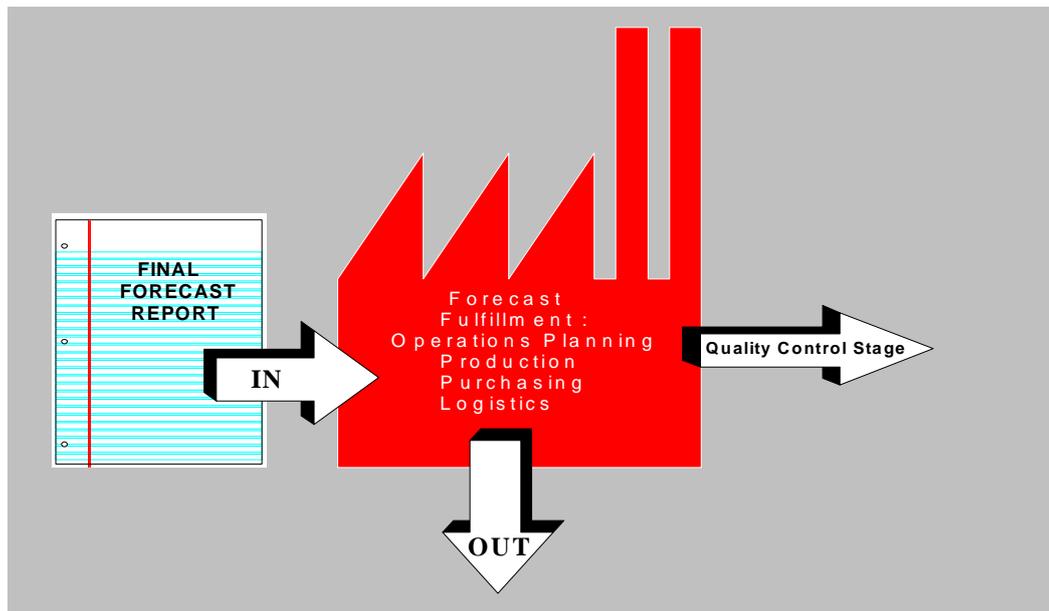


Exhibit 4.3: Forecasting Process Stage 2 – Forecast Implementation Stage

The final stage of the process, the Forecast Quality Control stage provides the following:

- a) a vehicle to measure the accuracy of the forecasts generated through the various sub-stages of the Forecast Development stage.
- b) the visibility for a firm to assess if it is utilising, circumventing or ignoring the forecasts it is developing. A by-product of this exercise is an assessment of the *execution performance* of the forecast fulfilment units of the firm such as manufacturing, operations, logistics, finance, purchasing, marketing or sales.
- c) quantitative feedback to the various forecasting approaches used by the firm to ensure ‘what works will continue to be used and what does not work will not continue to be used.’ The intent behind this type of feedback is to allow the forecaster, his/her staff and the methods they use to establish ongoing credibility levels in the eyes of senior management and to ensure mistakes are not repeated. More importantly this stage provides a

standardised, robust measure of best practices and best results. It measures the performances of the technical forecasters, it measures the performance of the subjective forecasters, it measures the performance of those who interfere in the forecast process (the nay-sayers, the corporate politicians and the second guessers) and it measures the performance of any other entity who wishes to get involved in the process. This facet of the quality control stage also performs the dual function of reinforcement and consolidation of best practices within the process and the culling of poor practices from the process.

- d) a ‘closing of the loop’ in the forecasting process. Practice shows the value of this feature cannot be understated. Firms utilising an open-ended or one way process forgo the opportunities of iterative improvement provided by closed loop approaches.

The final stage of the process, the Forecast Quality Control stage is shown in Exhibit 4.4 and a schematic of the entire three stage process as a whole is shown in Appendix B:

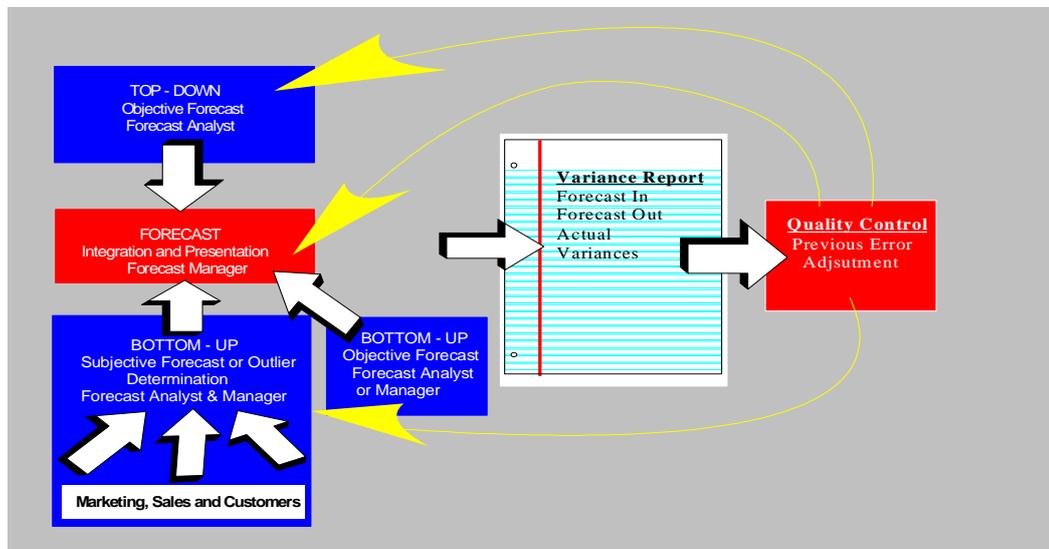


Exhibit 4.4: Forecasting Process Stage 3 – Forecast Quality Control Stage

The qualitative event driven ‘principles’ offered by Armstrong (2001) summate to 16 categories and 139 ‘principles’. The qualitative event driven ‘benchmarks’ offered by Mentzer *et al.* (1999) summate to four ‘dimensions’ and 70 ‘benchmarks’. The interview plan discussion points spawned from the three stage process described above is divided into 7 distinct categories containing 33 proffered Western benchmarks and 24 related forecasting criteria and attributes. The 7 categories are: (A) The Forecasting Process, (B) Forecast Development, (C) Integration and Presentation, (D) Forecast Implementation, (E) Forecast Quality Control, (F) Forecasting Department, (G) Organisational Support.

The interview plan containing the list of 33 benchmarks (shown in blue text) and the remaining 24 related forecasting criteria is shown in Exhibit 4.5:

Forecasting Benchmark or Criteria

A) Process

- 1 Exist
- 2 Open Ended
- 3 Closed loop
- 4 Adaptive

B) Forecast Development

- 5 Top-Down
- 6 Bottom-Up
- 7 Time Series Methods
- 8 Cause & Effect Methods
- 9 Judgemental Methods
- 10 Forecasting Horizon
- 11 Periodicity of Forecast Generated
- 12 Forecast Revision

C) Integration and Presentation

- 13 Reconciliation of Different Forecasts
- 14 Conflicts of Interest Affect Accuracy
- 15 Number of Forecasts Used
- 16 Integration of Forecasts
- 17 Consensus Meetings
- 18 Forecaster Driven
- 19 Functional Dept. Driven
- 20 Senior Management Presentation
- 21 Senior Management Changes

D) Forecast Implementation

- 22 Track Implementation
- 23 Perform to Forecast
- 24 Track Variance
- 25 Reconciliation of Variance

E) Forecast Quality Control

- 26 Track Forecast 'In' Quantity
- 27 Track Forecast 'Out' Quantity
- 28 Track Actual
- 29 Measure Forecast 'In' Variance
- 30 Measure Forecast 'Out' Variance
- 31 Variance Feedback to Development
- 32 Feedback Impact

F) Forecasting Department

- 33 Existence of a Department
- 34 Age of Department in Years
- 35 Independent Unit
- 36 Established Accuracy Record
- 37 Forecasting Perceived as Credible
- 38 Line Function
- 39 Staff Function
- 40 Located in Forecasting
- 41 Located in Strategic Planning
- 42 Placement of Forecasting
- 43 Number of Forecasters
- 44 Employees Engaged in Forecasting
- 45 Background
- 46 Forecaster has a Master's Degree
- 47 Salaries of Forecasting Employees
- 48 Accuracy Based Salary Incentive
- 49 Error Levels

G) Organizational Support

- 50 Management Highly Supportive
- 51 Separate Budget
- 52 Separate Systems
- 53 Forecasting Systems
- 54 Separate Software
- 55 Forecasting Software Used
- 56 Use of Internal Consultants
- 57 Use of External Consultants

Exhibit 4.5: Study Western Qualitative Benchmarks and Discussion Points

At this point a brief description of the benchmarks and discussion points contained within each category is in order. Accordingly, the Process category benchmarks assess the existence, form and function of a series of forecasting actions or steps taken by a firm towards achieving an effective forecast. Firms may or may not have a formal process or no process at all resulting in certain practices being a collection of uncoordinated and unaccounted for forecasting actions or events. On the other hand, the series of forecasting actions and events may be structured, coordinated and systematic and those conducting them are held accountable. Investigation of the two approaches differentiates best from poor forecasting practices. This category addresses many of the Mentzer *et al.* 'Approach' dimensions. The Forecast Development category of benchmarks assess the types of broad forecasting approaches used in the development of forecasts. Issues such as forecasts being developed using top-down, bottom up or combination approaches are addressed. Similarly, the types of data (internal, external, both) used in the aforementioned approaches are also examined. The type/s of approach/es and data used in turn will determine the type/s of forecasting method/s used. In this category a firm's use, abuse, misuse and proficiency or lack thereof in time series, causal and subjective methods of forecasting are brought under the spotlight. In the Integration and Presentation category the firm's ability to integrate various differing forecasts into harmonious ones and also into its functional units to secure the participation, support and approval (with or without amendment) of its senior management is assessed. This category addresses many of the Mentzer *et al.* 'Function Integration' dimensions. Upon passage through this important senior management orientated category, the next hurdle of the firm's ability to implement the forecasts it produces is examined. This is accomplished through a review of the Forecast Implementation category of benchmarks. Should the firm be found to be proficient in the aforementioned, oft misunderstood, ignored or taken for granted implementation actions, the next test is to appraise the firm's ability and conduct in making and learning from its forecast mistakes. This is achieved through a thorough consideration of the Forecast Quality Control benchmarks. Should a firm track its past forecasts, measure the appropriate variances, determine patterns (if any) in the variances and ensure lessons learned are applied to future forecasts, favourable forecast results and best practices should be observed. If however, a gap in this area is observed, remedies in these practices need to be implemented. Linked to the all of the aforementioned benchmarks are those related to the Forecasting Department and Organization Support provided to the forecasting function. These benchmarks assess the quality of a firm's forecasting 'engine' and its 'engineers'. Important issues such as the qualifications, experience, competency and effectiveness of the forecasting staff and forecasting management are addressed. In a similar fashion the organisational support provided to the forecasting staff, management and department in the form of funding, software, hardware, consultants, mandate and authority is also scrutinised. This category goes far beyond the Mentzer *et al.* 'Performance Measurement' dimension.

In addition to the above qualitative discussion points a series of quantitative discussion points are included in the IP. These quantitative discussion points mirror the IBF's 'benchmarks' or metrics-in-use. The data gathered from these discussion points are used as supplementary measurements

to the qualitative benchmarks. The number of forecasters employed by the firm and the salaries they are paid by the firm are typical examples of the supplementary quantitative data.

4.4 Interview Procedure

The Long Interview protocol calls for the investigator during the interview to:

- 1) appear benign, accepting, curious and willing to listen.
- 2) assure the respondent that there are no wrong answers and that any potential loss-of-face that can occur in any conversation is not a danger in the forecasting interview. This assurance is delivered by ‘signalling assent’ and creating ‘face safety’. To achieve this, respondents and their firms were assured of strict confidentiality and anonymity. This was done in writing and a non-disclosure agreement similar to those used in Type 4 consulting assignments were also offered to the respondents and the firms.
- 3) deploy grand questions, floating and planned prompts including ‘auto-driving’.
- 4) harvest data on identified and anticipated cultural categories.
- 5) cultivate data on unidentified and unanticipated cultural categories.
- 6) tape record all interviews and produce a word for word transcript.

The present study adopts all the above calls with the exception of tape recording the interviews as consulting experience has shown the act to be inconsistent with items 2 above. In a business forecasting setting and in particular one where the protagonists are not performing well the defensive walls, smoke screens and obfuscation barriers will most likely be deployed if a tape recorder is turned on in an interview. These cultural reactions run counter to the goal of discovering true and all the cultural categories. The disadvantage of having to listen intensely and take detailed notes of the respondent’s words, utterances and innuendos at the same time is outweighed by the advantage of potentially discovering the truth, the whole truth and nothing but the truth. This study believes Mentzer *et al.* and Moon *et al.* ran into the same problems and converted from audiotaping to note taking as the mode of interview recording. Moon *et al.* (2003: 17) state: “*Each interview is audio-taped so any differences in interpretation can be resolved at the time of data analysis*” referring to the interviews of the initial 16 audit firms. Mentzer and Moon (2006: 296) state: “*Each auditor takes detailed notes so any differences in interpretation can be resolved at the time of data analysis*” referring to the interviews conducted on the cumulative total of 25 audited firms.

Floating and planned prompting and especially the use of ‘auto-driving’ is quite common in cultural anthropology studies and is not too different in its application and intent in consumer research studies. Woodside and Wilson (1995) utilized this approach in the study of US household gardening consumer purchasing patterns and compared their interview findings against a number of theories-in-use. The auto-driving prompts consisted of photographs, catalogues and actual competing

gardening products. Woodside *et al.* (2004) similarly conducted a study of the leisure and travel behaviour of Canadian tourists. Hotel, restaurant and transportation literature and advertisement were the auto-driving prompts. Psychiatrists and industrial psychologists use the same approach and in particular the Rorschach ‘inkblots’ to elicit free association responses during open ended interviews. McCracken describes the procedure as: “*The respondent is asked to comment on a picture, video, or some other stimulus, and to provide his or her account of what they see there.*” (Emphasis added). Consistent with calls 3, 4, and 5 above, a number of forecasting practice related visual aids (charts, diagrams, schedules and displays) will constitute the study auto-driving planned prompts. Each visual aid will provide the respondent with the opportunity to display or not display familiarity, knowledge, experience or competence with the particular qualitative forecasting event and benchmark shown. During this visual free association exercise the researcher can in short order evaluate the respondent’s representation of the firm’s practices. Experience has shown greater insights are gathered not by what the respondent states and identifies but what the respondent does *not* state and identify. Equally illuminating is having two or more forecasting representatives from the same firm observing an identical forecasting prompt visually representing a particular forecasting benchmark and describing different events or forecasting practices at the same firm! Consistent with the interview procedure and *dependent upon responses to discussion points* the prompts may be deployed as auto driving planned prompts or not at all. The first auto-driving prompt that may be shown to the respondent contains a skeleton of the closed loop integrated forecasting process components described previously on a piece meal basis. The components are randomly displayed. The respondent is then invited to describe or compile the forecasting process used at the subject firm utilizing, if they wish, the components provided in the skeleton. Opportunity is also provided to the respondent to ignore the skeleton and sketch out their process from scratch. From this exercise the investigator is quickly able to assess gaps in the firm’s process, if any exist, relative to the process benchmark. Auto-driving prompt 1 is shown in Exhibit 4.6:

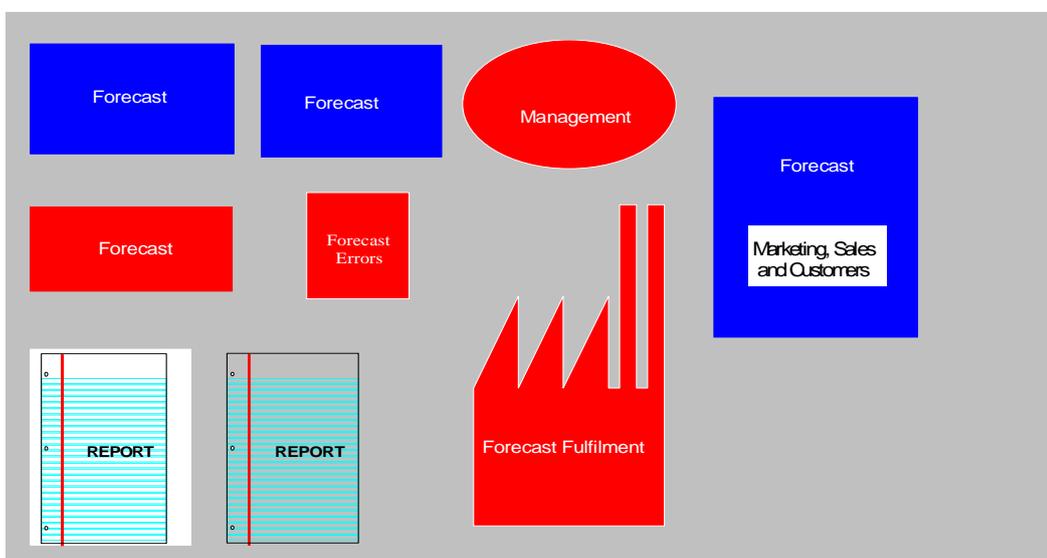


Exhibit 4.6: Auto-driving prompt 1 – Skeleton Forecasting Process

Exhibit 4.7 displays three types of forecasting variables. Firstly, there are variables with medium to long term recorded histories of financial performance (sales, orders, earnings, headcount etc.). Secondly, there are variables with shorter recorded histories of the same or different measures and lastly there are variables with no history (e.g., a new product) or no recorded history such as an unharvested market segment. Associated with each of these types of history differentiated variables is a bank of item 'predictors' displayed with a blue background on the left side of Exhibit 4.7. These 'predictors' may be seen as scientific measures and facets associated with the variable that are helpful or relevant in predicting future activity levels of the variable. These predictors are the time series components of trend, seasonality, trend-cycle, random outliers or 'grey swans'. The latter term is a milder form of a 'black swan' event. A 'black swan' is the recent brainchild of Taleb (2007) who defines a 'black swan' as an event that is unpredictable (nothing in the past can point to its possibility, has extreme impact (both positive and negative) and is subject to human retrospective 'explainability'. He further defines this extreme outlier as being intractable and differentiates it from the 'grey swan' which is deemed tractable and therefore included in the list of Exhibit 4.7 'predictors'. In addition to the time series components and 'grey swans' that usually manifest themselves in external macro conditions, firm level measures and activities such as recorded order backlogs, new product introduction plans, BOD ordained goals and very importantly, the recorded accuracy levels of the firm's staff engaged in forecasting. Associated with each left side bank of variable predictors is a right side bank of objective forecasting methods the firm's forecasters may wish to deploy in trying to predict future activity levels of the variable. The methods are shown with a red background. As an example, if a firm sells a product whose sales are trending upwards but has been subject to within quarter seasonal highs and lows and outlier orders from a group of major customers, the forecaster may wish to load the recorded histories of these events into a Classical Decomposition method. Similarly, if he/she has already done this in the past with limited success due to unexpected movements in the industry or economy he/she may wish to enhance the time series analysis with the results from a causal econometric model. The latter is presented as a methods option in the right hand side bank. Should time series and econometric methods be beyond the technical capability of the forecaster he/she may wish to consider rudimentary spreadsheet methods also arrayed in the right hand side bank. Keeping track of the accuracy levels of all the methods used is to be considered as important as the task of generating the forecasts. To perform this important function the right hand side bank provides a number of objective measurement options.

The entire complexion and spectrum of methods options changes when limitations are placed on the time series length available for analysis. Consequently, when a statistically significant history of seasonal highs and lows is not available or recorded, the forecaster uses certain time series methods at their peril. To prevent this folly, the right hand bank options diminish leaving the forecaster to consider using technological methods on comparable variables (a competitor's more established and longer life product) or econometric models applied to an industry or a country where the firm has a sales presence as a surrogate or analogous forecast for the variable without a signifi-

cant time series history. This approach is frequently used in the technology sector merger and acquisition business when not only is time series data limited, it does not exist. A firm wishing to know whether it should acquire, develop or enhance an emerging technology often hires econometric consultants to model the performance of a target firm’s product in a particular vertical market, industry or country. ‘Ruggedized econometrics’ is tailor made for this challenge. For most firms however, the options of low level time series methods and the credibility or accuracy of the firm’s forecaster are seen as more understandable and manageable options. The bottom right hand side bank of Exhibit 4.7 guides the forecaster accordingly by displaying the prudent options.

In summary, careful examination of the objective methods auto-driving prompt shown in Exhibit 4.7 reveal the methods listed are categorised as time series, causal, technological and simple business or spreadsheet algorithms (e.g., year on year percent increases, compound and geometric growths) techniques. Each method has certain data requirements for the methods to be used properly. Best practice requires the forecaster to make sure sufficient data is available for the utilization of a particular method and associated statistical significance levels are respected. This auto-driving prompt will reveal very quickly if the respondent is able to differentiate between the different types of variables and forecasting methods, the data requirements of each and the validity of the resultant forecasts. In the event a firm does not understand or use objective methods of forecasting, gravitating rather to the use of subjective methods, auto-driving prompt 3 shown in Exhibit 4.8 may be displayed and discussed with the respondent:

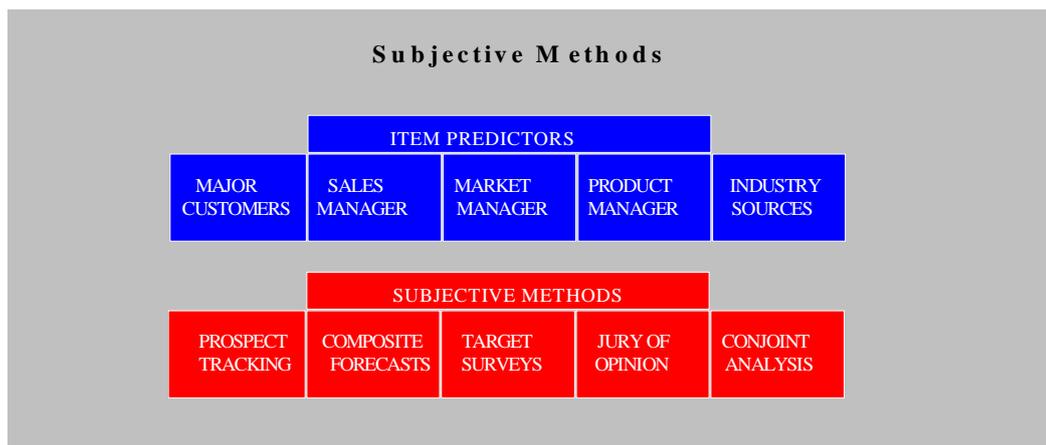


Exhibit 4.8: Auto-driving prompt 3 – Subjective Forecasting Methods

The firm’s practices related to the use of subjective forecasting methods are explored with particular emphasis to the range of methods available and used, the quality of the forecast item predictors or targets of the methods and the validity of the forecast results. A typical poor practice scenario is the use of bottom-up target surveys or composite forecasts of field sales personnel or major customers for medium to long term (3 to 12 months) operations planning. Field sales personnel typically focus on monthly and quarterly quota goal attainment as short term compensation and bonuses are determined by those quotas. It is not uncommon for results from bottom-up field sales or

composite forecasts to show downward patterns in sales or demand two, three and four quarters out. How a firm interprets this data is an indicator of best or poor practice. Is the two to four quarter downward pattern a measure of genuine softness in customer demand or is this merely a case of lack of visibility on the part of the salesperson or is it even more likely the firm does not have short to medium term information gathering capabilities and training in place? Similar questions may be asked of the poll results of major customers. If the poll indicates customer purchase quantities and intentions drop off significantly in the second, third and fourth quarters, does that mean they genuinely are not going to purchase the same levels of goods as the first quarter or does this mean they simply do not know or have not received purchasing authority for those later quarters? Answers to these and other questions related to a firm's practices in subjective forecasting methods are provided from the responses and interpretations to auto-driving prompt 3. Should a firm engage in the practice of 'sanity checking' its forecasts derived through the use of internal or firm specific data only (using objective methods and/or subjective methods) with objective cause and effect methods using external industry, market and economic data, auto-driving prompt 4 – Turning Point Indicators as shown in Exhibit 4.9 is displayed and discussed. The aforementioned practice indicates awareness by the firm that internal time series forecasts are by and large homophobic in nature and extrapolative in design and rarely if at all predict turning points in the market, industry and macro economy.

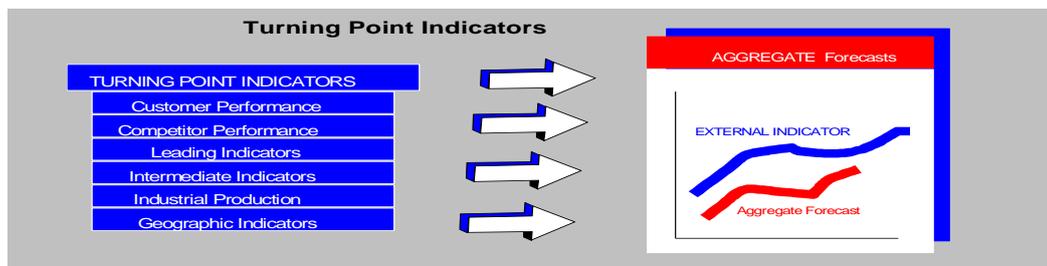


Exhibit 4.9: Auto-driving prompt 4 – Turning Point Indicators

Should a firm not engage in any practice of forecast reconciliation or only use a single approach with a single method or single approach with multiple methods, the quality of these practices are also examined. This is accomplished through the use of auto-driving prompt 5 – Forecast Reconciliation shown in Exhibit 4.10:

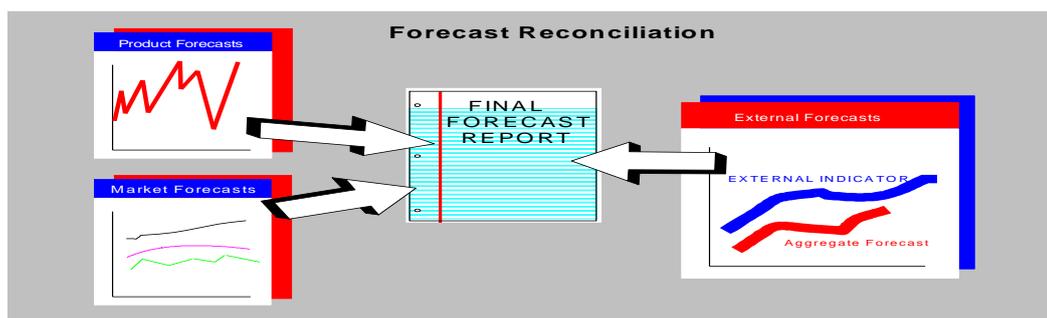


Exhibit 4.10: Auto-driving prompt 5 – Forecast Reconciliation

To conclude the evaluation of a firm's practices with respect to the use, understanding and application of the different portfolios of methods, auto-driving prompt 6, reflecting a three axis spatial diagram is displayed. Dimensions of different forecasting approaches are measured on each of the three axes. The dimension of how much or how little responsibility and control a firm's forecasting approach engenders is measured on the Y-axis. The dimension of how far into the future and how adaptable is a firm's forecasting approach, is measured on the Z-axis. The dimension of how automated or how manual is a firm's forecasting approach, is measured on the X-axis. These dimensions are shown in Exhibit 4.11:

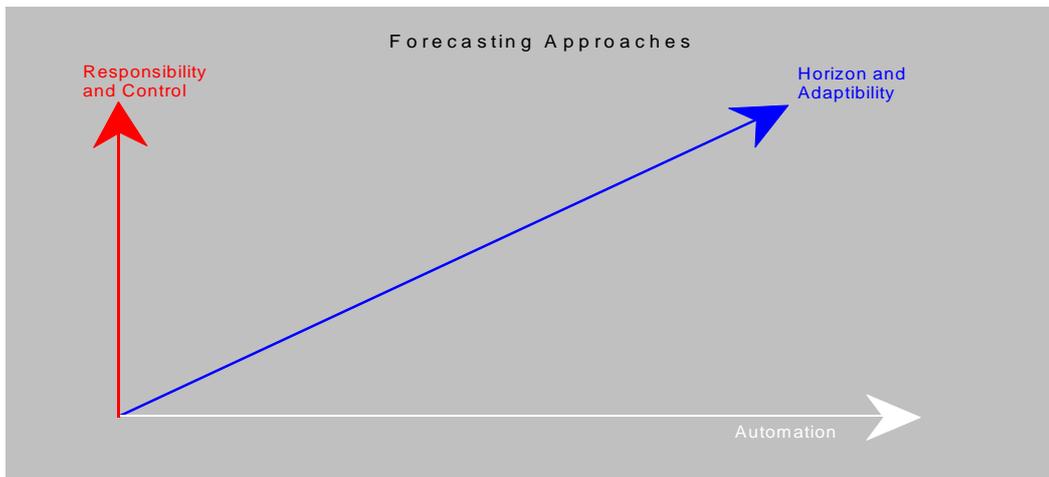


Exhibit 4.11: Auto-driving prompt 6 – Forecasting Approaches

The measurement process is accomplished by simply requesting the firm's forecasting representative to spatially depict (draw) the area of location he or she perceives is representative of the firm's current forecasting approach. Typically, a number of representations flow from these exercises that are reflective of best, good and poor forecasting practice *vis-à-vis* forecasting approaches. An exemplar of a completed approach depiction is shown in Exhibit 4.12:

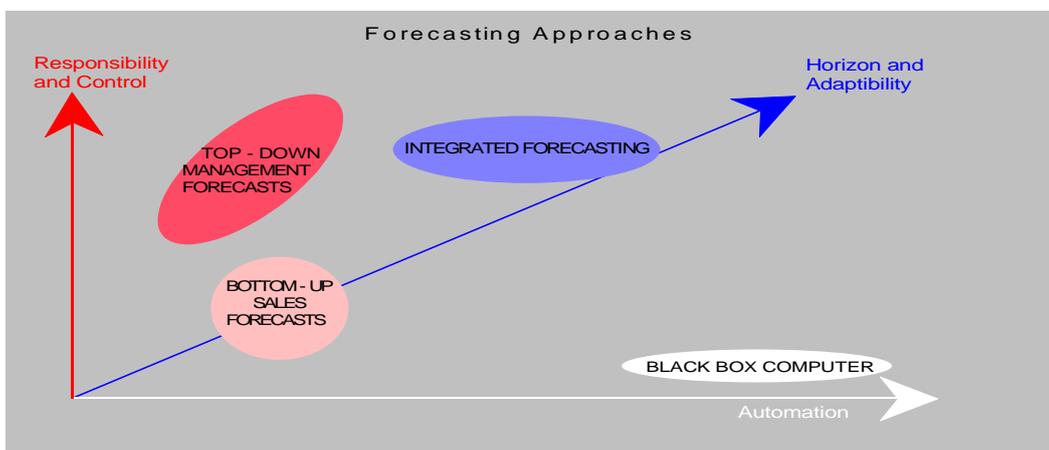


Exhibit 4.12: Depicted Forecasting Approaches

It should be noted the respondents are requested to depict a location on a two dimensional drawing with three characteristics or dimensions. Where difficulty is encountered in the 2D auto-driving prompt a 3D version of the auto-driving prompt is produced. 75% of Type 4 data respondents did not encounter difficulty with the 2D version.

Assessing a firm’s forecasting approach with respect to automation, horizon and adaptability is a relatively straight forward exercise as it involves measuring the existence and magnitude of each dimension. Assessing and measuring the magnitude of responsibility and control requires deeper analysis as this dimension varies depending upon the life cycle stage of the variable being forecasted. As an example, a firm’s practice of assigning responsibility and control of a forecast of demand for one of its *products* may differ if the product is in the embryonic stage as opposed to peak or atrophy stages of the product’s demand life cycle. In the event the respondent leads the interview into the area of product life cycle forecasting practices, auto-driving prompt 7 may be deployed to assist in the evaluation and is shown in Exhibit 4.13:

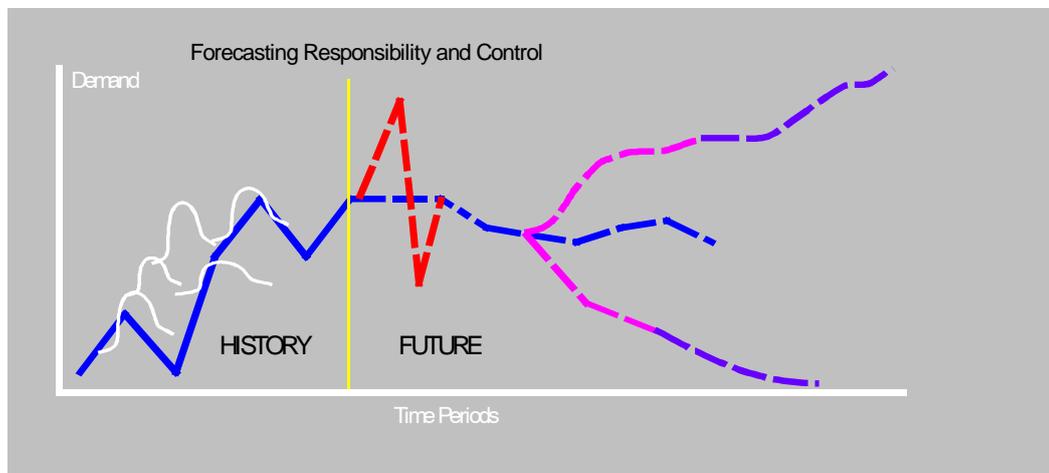


Exhibit 4.13: Auto-driving prompt 7 – Forecast Variable Life Cycle

To the experienced and well practised forecaster, the stages of a product’s life cycle as reflected in Exhibit 4.13 are easily identified. The historical data of the product reflects embryonic, growth, saturation, peak, maturity and atrophy stages of the various composite products or models of the main product. The short term demand may be conditioned by trend, seasonal and outlier components. The medium term demand may be impacted by phase-in and phase-outs and retrofits of the product and the long term demand may be influenced by product discontinuance and/or next generation introductions. Recognising these distinct phases both in the historical data and forecasts should influence a firm’s practices and make it easier in assigning responsibility and control of the forecast depending upon the stage in question. A graphical representation of a good practice and in some cases best practice of assigning responsibility between a firm’s functional units and the forecasting department is shown in Exhibit 4.14:

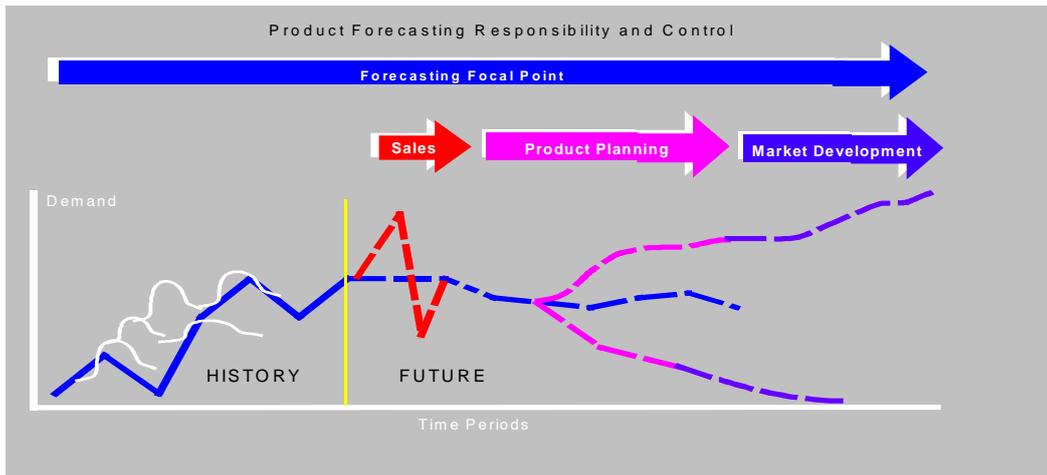


Exhibit 4.14: Product Forecasting Responsibility and Control

In this practice setting, the forecaster (forecasting champion) or forecasting focal point (FFP) in the event the firm does not have an officially named forecaster has responsibility and control for managing and using the historical demand data and generating independent forecasts as shown in the solid and broken blue line. The FFP assumes joint responsibility and control with the sales department in determining the amplitude of short term outliers and the bending of the objective demand curve accordingly. The FFP similarly assumes joint responsibility with the product marketing department in bifurcating the medium term objective demand curve for phase-in and phase-outs and with the market development department for long term next generation introductions or product discontinuances.

To this point auto-driving prompts 1 through 7 are available during the interview to guide and explore a firm's *existing* or 'as is' practice state with respect to the use of processes and methods, forecast development, integration, presentation and implementation.

In much the same manner as Moon *et al.* (2003) forecasting audit explores 'as is', 'should be' and 'the way forward' states, optional deployment of floating prompts examining a firm's ability to improve its forecasting practices, a quasi consolidation of 'should be' and 'the way forward' states, are at the ready. If the respondent does not raise this important facet of forecasting practices, planned auto-driving prompts are also at the ready. Implicit in this preparation is the assumption the responding firm does not have a viable forecasting function, process and/or forecaster. Alternatively, the firm's management is not satisfied with the performance and/or results of the existing forecasting status quo and wishes to take steps to improve. In short, what is the quality of their forecasting improvement knowledge, ability and practices? To assist in the answering of these questions, the unpopulated version of auto-driving prompt 8 as shown in Exhibit 4.15 may be deployed. This auto-driving prompt assesses a firm's ability to recognise and take quantitative and qualitative stock of its current forecasting 'factors of production' namely, forecasting labour and capital, both hard and intellectual. The respondent is afforded the opportunity to provide information on the firm's existing or desired forecasting factors of production or components. This infor-

mation is used to populate the empty coloured factor boxes. The results of this exercise are compared against the populated/benchmark version of auto-driving prompt 8 shown in Exhibit 4.15. Gaps and matches are noted:

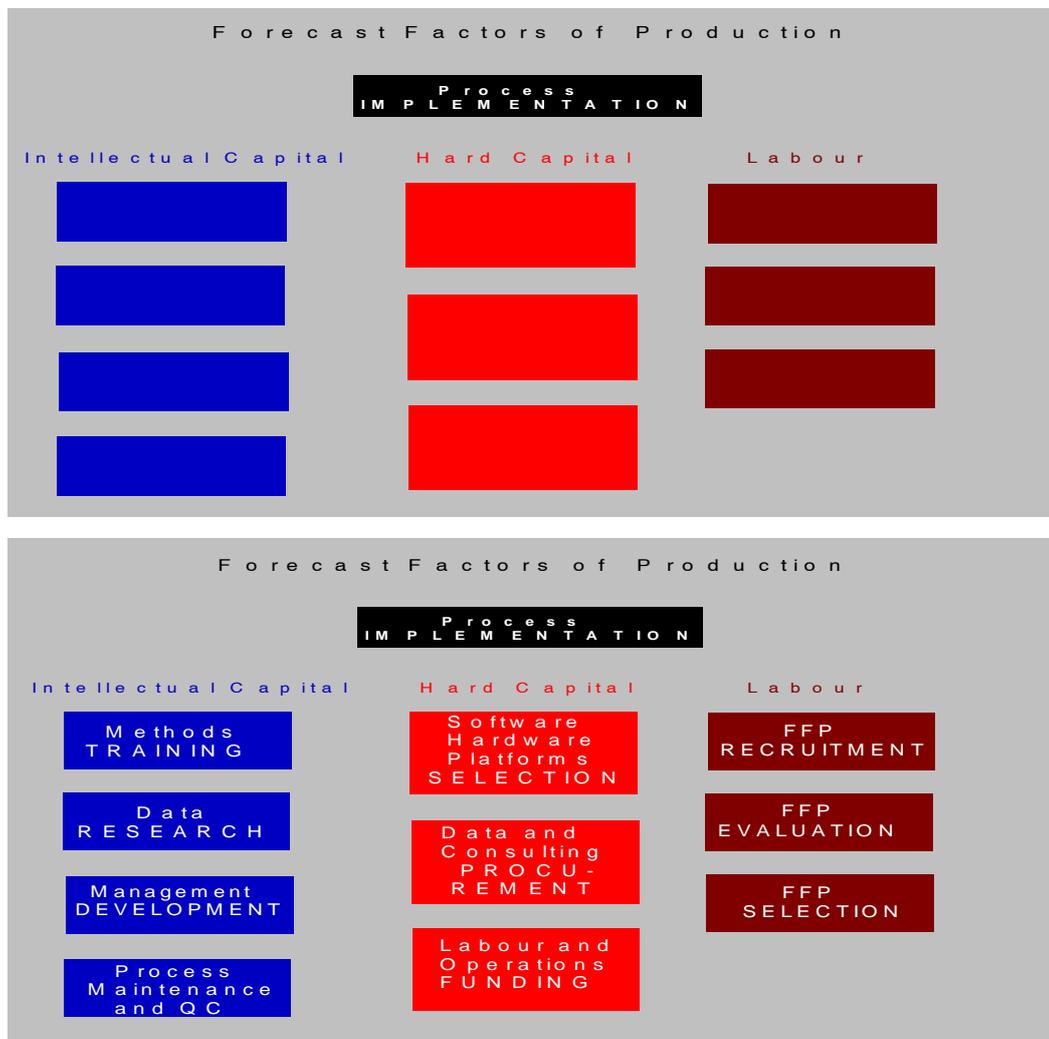


Exhibit 4.15: Auto-driving prompt 8 – Forecasting Factors of Production: Unpopulated and Populated

Where matches in the existence of factors are found the exercise moves to evaluate the manner in which the firm deploys or intends to deploy the factors. Clearly, the question of whether the firm does or intends to deploy these factors in a structured manner and part of a systematic process or in a ‘see how we go’ manner needs to be explored. Auto-driving prompt 9, shown as Exhibit 4.16, is available to assist in answering this question. The respondent again may be presented with a blank template, this time of a deployment pyramid (consistent with the benchmark closed loop, integrated forecasting process shown in Exhibits 4.1, 4.2 and 4.3) and may be invited to provide information to populate the rungs of the pyramid. The respondent is not constrained to the format of the template, rather he or she is afforded the opportunity to sketch out a deployment map as they see fit. The respondent sketch or populated pyramid is then compared against the benchmark deployment pyramid and matches and gaps noted.

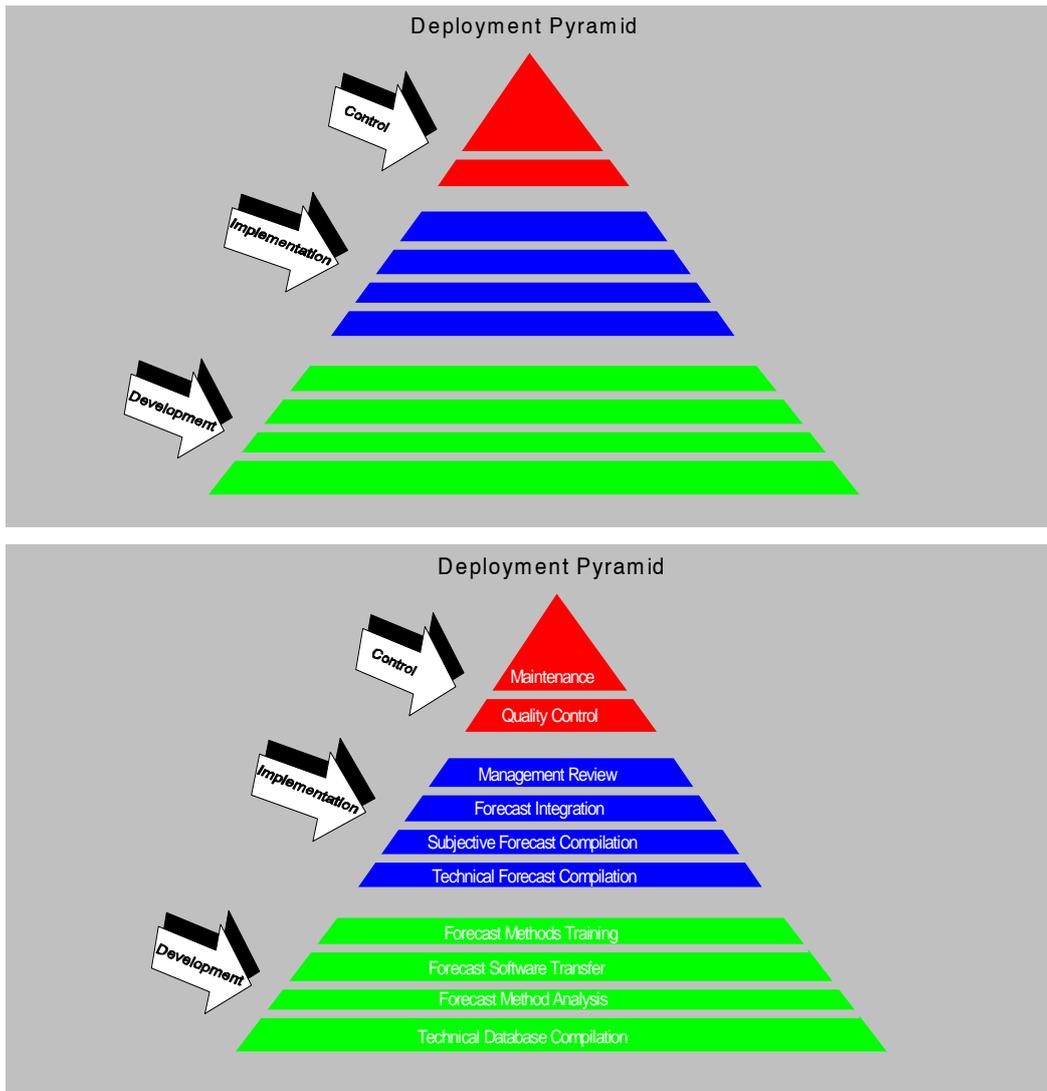


Exhibit 4.16: Auto-driving prompt 9 – Deployment Pyramid

Key to the success of the deployment of the forecasting factors, the process implementation and the forecasting function in general is the acumen, ability and effectiveness of the firm's present forecaster and the staff he or she commands. In the event the firm's management are dissatisfied with the present forecaster (staff included) and wish them replaced or alternatively the firm presently does not have a recognised forecaster and/or staff, the potential acumen, ability and effectiveness needs to be scrutinized even closer. In either of the above scenarios, it is essential the forecaster and/or staff have been or should be the subject of professional forecasting training to enable them to have a fighting chance of succeeding in the profession and meeting the demands of the employing firm (Jain, 2003: 76, 2006: 88). The present day state of Western forecaster training, whether it is provided by academic institutions, professional organisations or the firms themselves, fall far short of the standards of other recognised professions. The legal and accounting profession benefit from structured and mature academic programmes and collaborative on the job training in the form of the article process. Even recently recognised professional designations such as Certi-

fied Financial Analysts (CFAs) subject accepted university graduates who must have at least four years of employment or research experience in the area of investments to a minimum of three years intensive home study, seminars and examinations (CFA Institute, 2007). Contrast this with the offerings to professional forecasters. Firstly, there are no universally recognised programmes of formal training or study for one to become a ‘Certified Professional Forecaster (CPF)’. To their credit the IBF has established such ‘certifications’ and host forecasting training programmes. Unfortunately, the credibility and capital of such programmes fall far short of those of the CFA. In fact the CFA charter is considered an “*MBA on steroids*” (Jacobs, 2007). Secondly, formal forecasting academic courses or topics are generally relegated to the level of elective courses in MBA programmes or as part of statistics, operations research, management science and marketing courses. Regression analysis finds its way into more undergraduate and post-graduate courses with titles other than Forecasting. Finally, econometric offerings are provided as part of undergraduate and post-graduate economics degrees but are rarely structured in a manner as an integral part of a professional forecaster’s portfolio, especially of the bread and butter variety. Those scholars and professionals who provide their own structure invariably land up as macroeconomic forecasters for commercial banks or load forecasters for utility firms while industrial/micro forecasters in the manufacturing, retail, transportation, technology, automotive, healthcare and many other industries find themselves wanting in their setting due to lack of training.

This topic is indeed food for a thesis of its own and despite the magnetic temptation for the present study to wander in that direction, it will constrain itself to focussing on forecaster training event driven benchmarks. The assessment of the training standards of a firm’s current or ‘forecaster to be’ is achieved through the use of the final auto-driving prompt, number 10 as shown in exhibit 4.17:

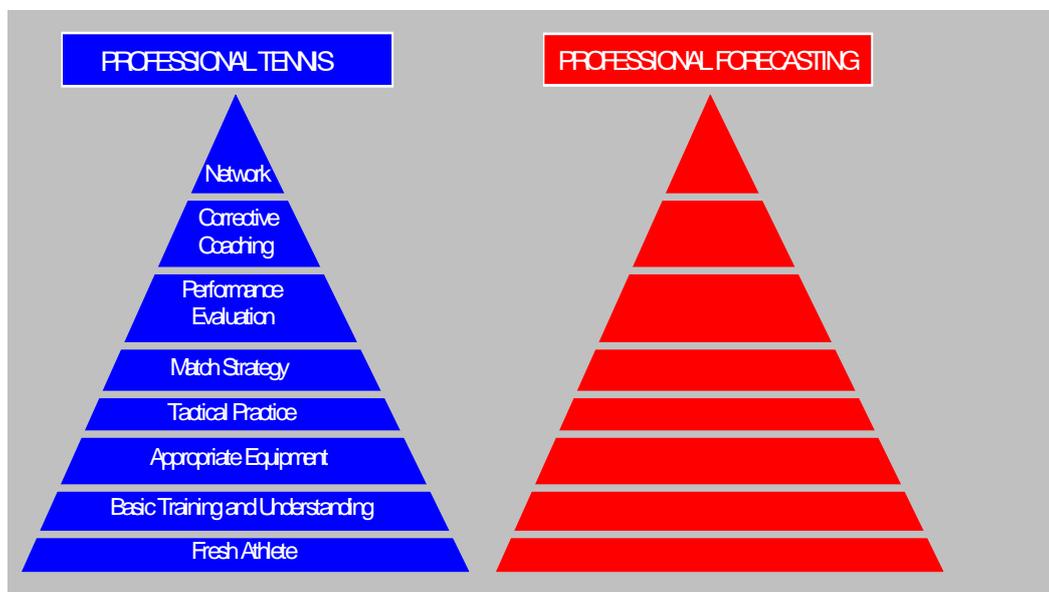


Exhibit 4.17: Auto-driving prompt 10 – Professional Forecaster Training: Unpopulated

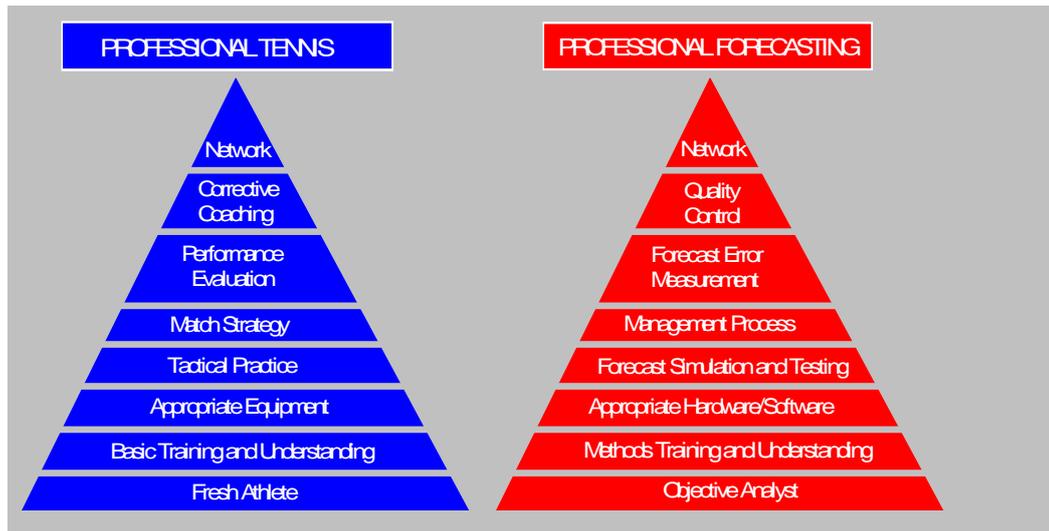


Exhibit 4.17: Auto-driving prompt 10 – Professional Forecaster Training: Populated

The usage mechanics of auto-driving prompt 10 differs slightly from those using a template fill in approach in that the fill-in section of this template is analogy based rather than vacant. This approach leverages off the popular Western, particularly the US, business phenomenon of sports event metaphors and jargon intruding into the business setting and becoming part of the standard business lexicon. Business plans are routinely referred to as ‘game plans’, strategic plans ‘as the play book’, key personnel as ‘players’, communicating as ‘touching base’, mis-communicating as ‘not being on the same page’ and many other examples are heard in Western conference rooms. The frequent practice of sporting celebrities being used and acknowledged as credible motivational speakers in business settings, particularly at sales ‘kick-off’ campaigns provides evidence to this phenomena. The rationale behind this use stems from the perception that competitive success in business is not too different from competitive success in sports and the two social activities routinely borrow from each other. Modern sports teams are run like businesses and vice versa. It is in this vein the forecaster training events benchmarks are characterised so as to allow a firm’s forecasting respondent, especially if that person is not knowledgeable in forecasting, to understand by analogy the best practices training portfolio required of a forecaster. Specifically, the respondent is provided with a brief description of the typical training portfolio of a professional tennis player. If the respondent is not a tennis player, an auto-driving prompt containing the training portfolio of a golfing professional is displayed. The majority of business executives are either competitive golf or tennis players. The respondent is then invited to provide comparable training events for either their current or prospective professional forecaster. The training portfolio of the professional forecaster completed by the respondent is then compared to the benchmark training portfolio and matches and gaps are noted. At the same time as these event driven qualitative benchmarks are being assessed, quantitative forecaster profile measurements, such as salaries, background and education are extracted from the respondents as these measures are important to obtain an overall assessment of the individual driving or likely to be driving the forecasting function at a particular firm. Auto-driving prompt 10 is the final prompt that may be deployed. Should inconsistencies in responses, whether prompted or not, occur during the interview a prompt may be redeployed to

gain response clarity and consistency. One of the foremost advantages of the interview method over survey methods is the 'on the spot' ability to highlight and reconcile inconsistencies in testimony. After the gathering of all responses and reconciliation of testimony (where needed), the respondent is allowed to articulate any other issues related to the subject matter. After the respondent has had the final say, the interview is concluded.

4.5 Number and Type of Interview Respondents

The choice of interview respondents is the final order of business conducted in the review of cultural categories step. McCracken (1988: 37) goes to great pains to advise that the group of respondents chosen for interviewing are: "*not a 'sample' and that their selection should not be governed by sampling rules.*" This position is consistent with the desire of the purists of the qualitative research approach to distinguish their approach from the quantitative approach. Qualitative researchers take exception to their approach being fashioned or judged by quantitative terms and standards. Quantitative or statistical sampling is an anathema in the qualitative arena. Industrial psychologist and qualitative case study expert Robert Yin (2003: 32) states: "*A fatal flaw in doing case studies is to conceive of statistical generalization as the method of generalizing the results of the case study. This is because **your cases are not 'sampling units' and should not be chosen for this reason.** Rather, individual case studies are to be selected as a laboratory investigator selects the topic of a new experiment.*" McCracken chimes in on this position clearly marking the boundaries of each approach: "*The quantitative project requires investigators to construct a 'sample' of the necessary size and type to generalize to the larger population. In the qualitative case, however, the issue is not one of generalizability. It is that of access. The purpose of the qualitative interview is not to discover how many, and what kinds of people share a certain characteristic. It is to gain access to the cultural categories and assumptions according to which one culture construes the world.*" However other renowned qualitative researchers, while quite consistent on the *locus standi* of statistical generalization in the field of qualitative research, allow the words sample and sampling to creep into their lexicon. Glaser and Strauss (1967) refer to 'theoretical sampling' in their grounded study research to distinguish the process from 'statistical sampling' and Miles and Huberman (1994) refer to 'bounding the collection of data' as sampling. This laxity and inconsistency in the use of the terms often results in qualitative business studies publishing elaborate 'sampling plans'. Examples of this practice in the literature are:

- 1) the Eisenhardt and Bourgeois (1988) study of the politics of strategic decision making utilizes a theoretical sample of 8 San Francisco based microcomputer firms.
- 2) the Winklhofer and Diamantopoulos (1996) study of export sales forecasting practice used a sample of 13 key informants from 11 UK firms.
- 3) the Woodside *et al.* (2004) grounded theory study of leisure travel used a theoretical sample of 34 Canadian tourists.

- 4) the Green and Weaver (2005) study of sales forecasting benchmarking used a ‘purposeful convenience’ sample of 7 US restaurant firms.

Finally, let us not forget the Moon *et al.* (2003) position on this important point: “*The sampling plan of the audit paper was companies that faced sales forecasting management challenges to test the efficacy of the audit methodology, and to observe the impact on sales forecasting performance of implementing the audit findings. To accomplish both these qualitative goals it was necessary to follow the advice of McCracken (1988) – it is more important to work carefully with a few people than to work superficially with many. Taylor (1994) argues that for qualitative research using in-depth interviews, a sample size of 15 to 30 individuals is typical to understand the phenomenon of interest.*” Quite ironically however, all of the studies mentioned above used some form of face-to-face interview protocol. Woodside, Green and Moon specifically use and cite to McCracken’s *Long Interview* protocol and then without explanation Green and Moon capriciously deviate from it. For replication purposes, this study adheres to the McCracken protocol and where deviations occur they are duly noted and justified in view of the practice analytic categories under consideration. The protocol guidelines for selection of respondents are:

- 1) the respondents should be perfect strangers
- 2) the number of respondents should be no more than eight
- 3) the respondents should not have a special knowledge or ignorance of business forecasting practices at their firm.
- 4) the respondent pool should be diverse and contrastive to allow distance to be created.

With respect to guideline 1, the study respondent pool was made up of perfect strangers. The pool was harvested through personal introductions from three key business and academic networking contacts. The one contact was the Director of the business school sponsoring the present study, the second contact was a retired financial institution board member and the third contact was the CEO of an industry trade group. These individuals approached variously known and unknown contacts and firms telephonically and in writing and requested respondent participation in the study by agreeing to be interviewed. The resultant pool of respondents and the instrument of inquiry, self, at the commencement of the interviews were perfect strangers.

With respect to guideline 2, the study deviated from the recommended quantity for a number of reasons. Firstly, the diversity and contrast guideline cannot be met with only eight respondents in a business forecasting practice setting. These practices are influenced and dictated to by the business measures (variables) being forecasted. Financial institution forecasting variables are vastly different from manufacturing SKUs and in turn are vastly different from balance sheet items of service firms, etc. In addition the comparative sizes of different firms will also influence practices and these sizes also have to be considered within the types of firms. Secondly, compelling arguments are offered by other qualitative experts outside the fields of consumer research, sociology and in-

dustrial psychology need to be considered in the context of best practices. Notably, qualitative experts in the field of health science practices such as Morse (1994) contend: “*phenomenologies directed toward discerning the essence of experiences include about six participants, ethnographics and grounded theory studies, about 30 to 50 interviews and qualitative ethological studies, about 100 to 200 observations*” as does Sandelowski (1995): “*determining an adequate sample size in qualitative research is ultimately a matter of judgment and experience in evaluating the quality of information collected against the uses to which it will be put. An adequate sample size in qualitative research is one that permits – by virtue of not being too large – the deep, case oriented analysis that is the hallmark of all qualitative inquiry, and that results in – by virtue of not being too small – new and richly textured understanding of experience.*” (Emphasis added). Thirdly, notice is taken of the Mentzer *et al.* (1999) ‘benchmark’ respondent pool of 20 firms, the Moon *et al.* pool of 16 and subsequently 25 firms and the Fildes and Hastings pool from 10 divisions of a UK manufacturing firm. These studies are on point *vis-à-vis* forecasting practices. With consideration to all of the aforementioned guidelines and offerings, the present study did not, *a priori*, stipulate or plan a set size of the respondent pool. Instead interviews commenced, evidence was gathered, patterns emerged, ‘snowballing’ was conducted (respondents at the conclusion of the interview were asked to provide introductions to colleagues at other firms), further interviews were conducted until one or all of three criteria were reached. These criteria were information redundancy, categorical saturation and deep understanding. This approach is consistent with sound qualitative research practices, particularly grounded studies. This approach resulted in the interviewing of 30 respondents from 20 South African firms.

With respect to guideline 3, the type of respondent that was sought at each firm was ideally the individual most knowledgeable on the forecasting practices conducted at the respondent firm. This person did not necessarily have to be the person who developed forecast information used by the firm. To this end the study gravitated more to the guideline spectrum of the individual not having a special ignorance on a firm’s forecasting practices. As a result the vast majority of the 30 respondents interviewed were senior managers holding titles of director (vice president), CFO, chief economist and/or general manager. With respect to guideline 4, the respondent pool was extremely diverse and contrastive as a result of a purposive selection process. Firms interviewed were both large (50,000 employees) and small (1,500 employees), representing a variety of industries (manufacturing, retailing, banking, investments, services, healthcare, technology and transportation) and most importantly having different forecasting requirements and variables (*inter alia* sales, SKUs, operating theatre minutes, interest rates, meals, licenses and litres).

4.6 Chapter Summary

Steps 3 and 4, the review and discovery of business forecasting cultural categories respectively, are presented and discussed in this chapter. The review of the cultural categories allows the study in-

strument of inquiry namely, the investigator to take an honest look at him/her self to determine what he or she honestly knows about the inquiry subject matter. Once this process of familiarization has occurred it is to be noted and distanced during the interview so as to ensure the testimony of the respondents are heard with the investigator's ears and not the conscious mind. The discovery of the cultural categories requires the development and utilization of a comprehensive, yet open-ended interview plan. The interview plan consists of discussion points which are the *de facto* study proffered Western benchmarks. These benchmarks were developed through a 'cherry picking' exercise of the offerings discovered in the literature search but more importantly from a transfusion of 25 years of primary, applied forecasting practice and acquired benchmark research. The latter research meets the critical bar of benchmarking namely, the identification and adoption of the practices of *dantotsu*. The derived benchmarks will surface during the interview procedure as either ordinary discussion points, floating prompts or as auto-driving planned prompts. The respondent may also unwittingly and unilaterally during the course of the interview raise and provide a response to a benchmark not yet discussed. The derived benchmarks will evaluate seven broad areas of the business forecasting practices of the responding firm. These areas evaluate the forecasting processes, development approaches and methods, integration, implementation, quality control, staffing and organizational support. The results of the qualitative benchmarking are also cross-referenced and supplemented with the results gathered from responses to the IBF's survey based quantitative metrics-in-use. Fildes and Hastings (1994) adopted a similar approach in as much as the results of 45 face to face interviews were also supplemented with quantitative survey based measurements. The selection of the respondent interview pool comports with the method of inquiry guidelines and is also cognizant of the offerings of the scholarly and applied literature on the qualitative inquiry subject. A purposive selection of respondents resulted in 30 senior managers from 20 South African firms being interviewed.

The steps of reviewing and discovering the cultural categories pave the way for the final step of the method of inquiry namely, the interview analysis and the discovery of the analytic categories. This step is taken in Chapter 5.

Chapter 5

Interview Analysis and Discovery of Analytic Categories

"I want to reach that state of condensation of sensations which constitutes a picture" (Henri Matisse)

5.1 Interview Synopses and Within-Case Summaries

The final step of the research strategy entails the presentation and analysis of evidence mined from the interviews, disclosure of findings, disclosure of patterns and themes where and should they exist and the reporting of ultimate conclusions reached. As outlined in Section 1.5 the suggested protocol for this step involves the execution of a fairly elaborate analysis process of five stages. The first three stages proffer a back and forth consultation of a verbatim typewritten transcript of the audio-taped or video-taped interview. As explained in Section 4.4 intrusive and counterproductive audio-taping was not conducted during the interviews. Instead detailed handwritten notes and laptop computer based forms and diagrams completed during the course of the interview memorialised the event. In lieu of transcripts, detailed notes were transcribed into draft interview or 'case' reports within 24 hours of each interview and any irregularity or gap in the notes was filled or reconciled with the respondent by phone or email over a nine month quality control interval after the interviews were concluded. Further data gathering quality control steps taken during and after the interviews will be discussed in detail in Section 5.3. The purpose, intent and function bar of an interview transcript is quite adequately met by the interview or 'case' reports of the present study. This is indeed so of like explorative, interpretive and evaluative studies. It is only in descriptive or narrative studies where minute details are required that a verbatim transcript may be essential. Determining patterns, themes, consistency and contradiction from a particular interview (within-case) is the fourth stage of the protocol. Back and forth consultation of the interview report facilitates this analysis. Determining patterns, themes, theses and theories as they appear in several interviews (cross-case) is the final stage of the analysis protocol. Again, back and forth consultation of each interview report and other items of evidence facilitate this type of analysis. On this point it should be clearly understood the '*Long Interview*' is a case study research strategy. As such the term 'case' or 'case report' encapsulates the entire gamut of evidence collected on the forecasting practices of the firm. This includes interview generated information and other evidence such as financial reports of the firm and investment analyst reports on the firm which may corroborate or contradict the evidence mined during the interviews.

Having dispensed with the necessary protocol housekeeping, grand tour synopses of the respondent interviews and appended within-case summary exhibits of the evidence gathered on the forecasting practices of 20 anonymous South African firms, are presented as follows:

Case 1 – Punters Ltd:

Punters is a gaming and entertainment firm that generated revenues of R1.6 billion or \$229 million in 2006. Punters holds a significant but not dominant share of the industry. Its revenues grew by 30% in 2006 and over the last five years at a geometric rate (GGR) of 17.8%. A two hour interview was conducted at the firm's headquarters with the company secretary who also holds the title of 'Financial Manager'. The latter is in his early 30s and holds a chartered accountant certification. He in turn reports to the Finance Director (FD) who is slightly older and is also a chartered accountant. They both report to the CEO who is a 36 year old chartered accountant. The only member of the management executive who is not an accountant is the 41 year old COO who holds an MBA. The gaming industry experience of the management group ranges from 7 to 16 years with an average of 11 years. The Financial Manager (FM) was determined to be the appropriate forecasting practice respondent as "*he does most of our forecasting.*" The FM perceives the firm to have a two man forecasting function that has been in existence for four years. Assessment of this perception reveals a *bona fide* forecasting function does *not* exist at the firm, rather the forecasting function is subsumed within the routine accounting and 'financial planning' functions. Variables forecasted consist mainly of income statement and balance sheet financial items and accuracy levels are reported in the range of 4% compared to actual results due to the perception of their operating environment being seen as '*mature*'. Forecasting methods employed are mainly judgemental and analysis and reports are compiled with off the shelf micro based spreadsheet software. The FM, earning R450/\$64 thousand annually, compiles the forecasts which are in turn reviewed, amended and managed by the FD, earning R1.75 million or \$250 thousand annually. As forecasting is not a separate staff or line function at Punters these salaries pay for a number of other staff and management functions.

The process Punters uses to compile forecasts is a two phase exercise. Phase 1 consists of the field Operations Managers providing their bottom-up operational forecasts to the FM. He in turn consolidates the individual forecasts into a group financial forecast and reports and presents same to the FD. The FD reviews the forecasts embedded in the group financials and performs one of two actions. In the event he wishes to make minor changes to the forecasts and 'financials' he will send same back to the FM. In the event he wishes major changes to be made he will communicate directly with the operations managers and attempt to reconcile same prior to submitting the reports to the CEO. The CEO will perform his own review. He may or may not make any changes prior to submitting the 'financials' to both the Board of Directors (BOD) and the principle Overseas Equity Holders (OEH). In the event he does make changes, these changes and/or '*suggestions*' are sent back down the management chain to the operational units. In the event he does not make any changes or '*suggestions*' the BOD and/or the OEH may do so which in turn will go back down the chain for implementation or explanation. The latter iteration constitutes Phase 2 of the process and is perceived as a top-down exercise. The process is shown in Exhibit 5.1 from an '*in situ*' construction by the respondent during the interview:

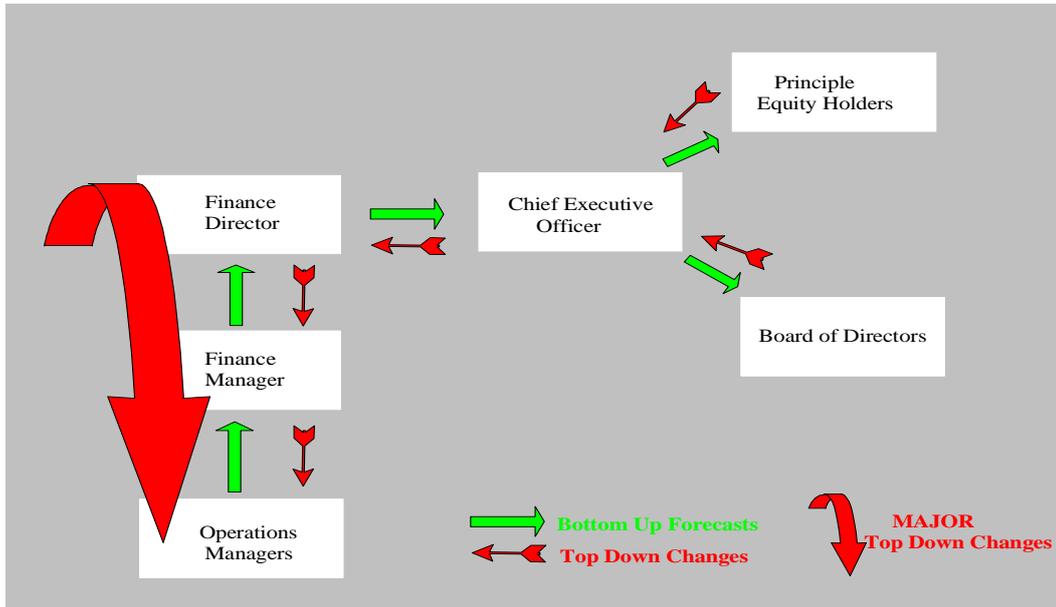


Exhibit 5.1: Punters Ltd Reported Forecasting Process

To elucidate upon all the forecasting practice phenomena at Punters a coded, condensed, and sorted summary is shown in Appendix A as Exhibit A.1. This summary displays in matrix form the forecasting criteria and associated criteria attributes Punters reports is present or not present at the firm. In addition Western benchmarks as detailed in Section 4.3 are included in the matrix. The first column of the matrix lists the analytic categories of either forecasting **criteria** or higher level **benchmarks**. The criteria and benchmarks are grouped into the 8 major categories as detailed in Section 4.3. These categories are process, forecast development, forecast methods, integration and presentation, forecast implementation, forecast quality control, forecasting department and forecasting support. Within each of these categories are events, criteria, ‘tests’ or benchmarks that were assessed or mined from Punters before, during and after the interview process. Events or criteria that constitute a benchmark are illuminated in blue text. In the second column of the matrix, analytic category associated **attributes** are listed. In the third column the **result** of the evidence mining or discovery exercise (interview, document reviews and independent analysis) conducted on Punters is symbolised. The **symbol legend** and the symbols are shown in the third and fourth columns of the matrix respectively. One of four differently coloured and shaded rectangles symbolises a different result. A solid shaded green rectangle symbolises the mining exercise uncovered evidence that supports Punters either meeting the standards of a benchmark or a forecasting criteria was present at the firm or one or more criteria associated attributes are present at the firm. A solid shaded yellow rectangle symbolises that evidence was uncovered that does not fully support all the conditions of benchmarks being met or criteria and attributes being present. A typical example of this is a respondent claiming a high degree of forecasting accuracy during the interview yet balance sheet, income statement as other forms of evidence contradict the respondent’s posit. A solid shaded red rectangle symbolises a remarkable incident of either a benchmark not being met, the absence of a forecasting criteria or attribute when the latter and former should *be* present at the firm or the existence of a criteria or attribute at the firm when the latter or former should *not* be

present in the context of the other forecasting practices of the firm. Lastly, a cream pastel rectangle symbolises benchmarks, criteria or attributes that are not applicable, not remarkable, not required or not unusual in view of other results or practices at the firm. In general, the Punters within-case matrix summary supplements the interview synopsis by providing further *ad hoc* details and codifies benchmark, criteria and attribute results for subsequent cross-case analysis. The table explanations and associated symbols are applicable to the within-case summaries of all the responding firms and are shown as individual exhibits in Appendix A. To avoid redundancy these explanations will not be repeated in each case synopsis but Appendix A exhibit references will be noted.

Case 2 – Lumbers Ltd:

Lumbers is an integrated, industrial wood products firm whose operations/value chain extends from its forests to its retail furniture stores. The firm generated revenues of R13/\$1.9 billion in FY07, up by 30% from the year before. The forecasting function has resided within its supply chain management department for the last four years. A 90 minute luncheon interview was conducted with the department manager who is in his early forties, has an engineering background and earns R650/\$93 thousand annually. Development and delivery of product volume and currency enumerated forecasts are conducted by a senior analyst with an engineering bachelor's degree earning R420/\$60 thousand a year and an analyst with a matric/high school diploma and a sales background earning R280/\$40 thousand a year. 'Forecasts' are generated for both supply constrained and unconstrained products. Recorded forecast variances are less for supply constrained products "*because we make, allocate and sell what we can produce*" compared to unconstrained SKUs. Variances at the SKU level for the former are 45% one month and one quarter out and 30% one year out while unconstrained SKUs are at variance with recorded actual sales by 75%, 70% and 30% at one month, one quarter and one year horizons, respectively. Forecast accuracy improves as products are aggregated into categories. Aggregate sales levels for the firm vary by 30%, 25% and 20% at one month, one quarter and one year horizons, respectively.

The forecasting process adopted by Lumbers is driven by the revenue goals of their '*Executive Sales and Operations Planning(S&OP)*' managers and the Consumer Products sales channels. Each of these groups of managers submit their goals to S&OP staff together with critical input on proposed price levels for each product. Prior to the submission to staff the goals are "*run through finance to make sure they agree.*" The S&OP staff attempt to reconcile differences between different inputs, compile a production and supply plan consistent with the goals and inputs and highlight to the line functions where they are capacity and supply constrained. The process as reported is depicted in Exhibit 5.2:

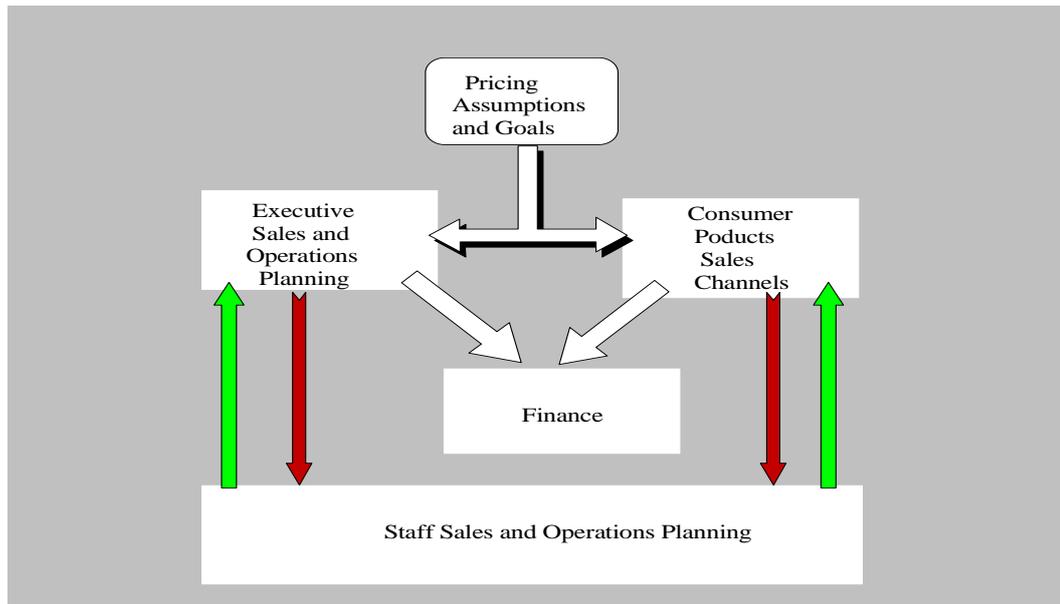


Exhibit 5.2: Lumbers Ltd Reported Forecasting Process

Detailed results of evidence mined from interviews, document analysis and independent analysis of forecasting practices and processes adopted at Lumbers is appended in matrix form in Exhibit A.2.

Case 3 – Loaners Ltd:

Loaners is one of the largest banking groups in Southern Africa providing retail and wholesale banking services, investment banking, foreign exchange and securities trading services. It employs over 20 thousand people. Loaners operating income was measured at R10/\$1.4 billion five years ago and has since grown at a geometric rate of 16% per year. A 115 minute interview was conducted at the office of the firm’s 47 year old Chief Economist. He leads a forecasting and economic analysis department that has been in existence for 30 years. His staff consists of two Senior Economists, two Economists and an Assistant Economist. The academic backgrounds of the staff are in Economics, Mathematics and Statistics and the highest level reached is that of a Master’s degree. His Economists are paid R400/\$57 thousand a year and his Senior Economists \$600/\$86 thousand a year. The forecast deliverables of this function are mainly macroeconomic variables such as GDP, foreign exchange rates, insolvencies, interest and credit rates which are all generated for monthly periods with the exception of GDP and insolvencies. The latter and former are generated for quarterly periods. All forecast deliverables are generated once a quarter. Reported forecast accuracy of quarterly GDP percentage forecasts are within the range of a single percentage point. Quarterly FX, insolvencies and credit rate forecasts deviate from recorded actuals by 5 to 10%. All the Economists at this firm are paid strictly on a fixed salary basis, no bonus is received for higher levels of forecast accuracy. The users of the forecast deliverables generated by this department are internal senior management executive committees, line operating groups and major commercial and equity customers. Two forecasting processes are used to determine which forecast levels are to

be used by both internal and external ‘customers’. The one process takes place at the Senior Executive Committee level and the other at the staff economic research level. The latter process consists of the staff economists gathering historical time series data, processing same with microcomputer based econometric time series and cause and effect software. The results are reviewed by the chief economist who adds his judgment to the models and outcomes and then has informal discussion with members of the Executive Committee and various finance committees to ensure the results are supportive of the firm’s budgets. Once the informal discussions, which are also advisory in nature, are completed the Executive Committee then proceeds to conduct its own formal, *in camera* evaluation and determination. The Executive Committee is a ten person committee consisting of five chartered accountants, two engineers, one with an MBA, a lawyer and two others. The average age of the group is 48 years with the eldest member being 57 and the youngest 39 years. The methods this group uses to determine its forecasts is not reported but is perceived to be mainly judgmental. Monitoring of accuracy of both processes is undertaken by the staff of the economic research department. The processes outlined above are shown in Exhibit 5.3:

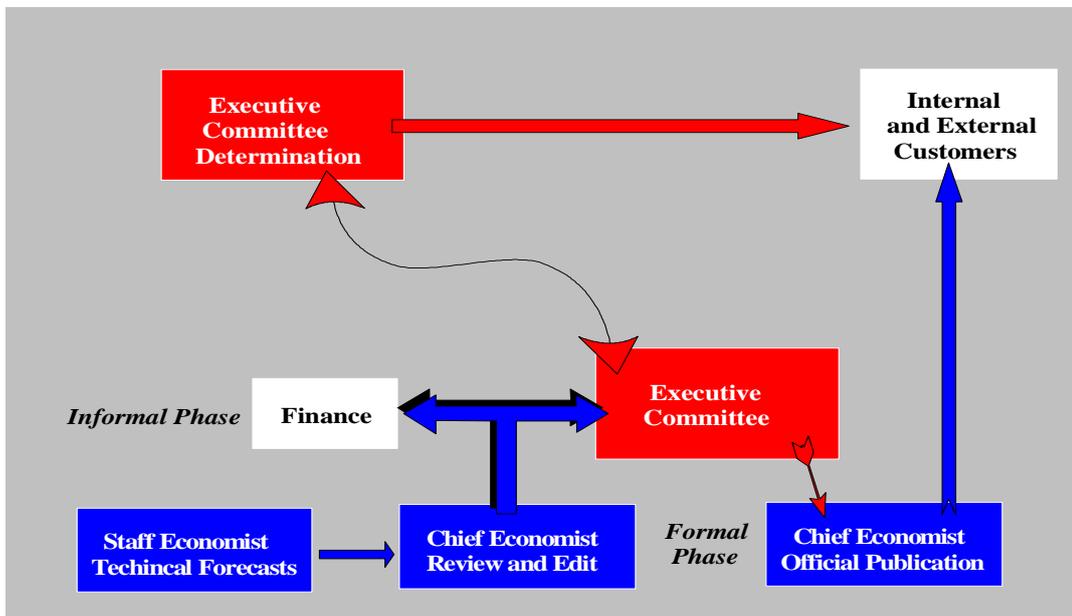


Exhibit 5.3: Loaners Ltd Reported Forecasting Process

Detailed results of the Loaners investigation are presented in the within-case summary appended as Exhibit A.3:

Case 4 – Networks plc:

Networks is a multinational IT services and infrastructure firm that was started in Johannesburg over 20 years ago and has recorded a GGR of 9% over the last five years. It currently employs over ten thousand people and operates in 35 countries across Europe, North America, Asia, Africa and Australasia. A two hour interview was conducted in Johannesburg with the group Financial

Manager (FM) as the latter was deemed to be the most knowledgeable employee on the subject of forecasting. An independent *bona fide* forecasting function does not exist at Networks. Instead a financial planning department that has been in existence for the last 7 years gathers information related to forecasting from 20 business unit line managers across the firm who are “*engaged in forecasting activity.*” Forecasts are judgementally determined from a bottom-up exercise of determining dependent and independent demand for the firm’s products and services. The dependent demand forecast is one of subjective probabilistic determination of which existing customers will be renewing and/or expanding upon their existing software service contracts. The independent demand forecast is a case of subjective probabilistic determination of which new customers will be placing orders for the firms existing and/or new products and services. It is reported that the forecast accuracy of these exercises is within 15% of actual product or service category sales over a one quarter horizon and within 5% for the firm as a whole over a one quarter and one year horizon. Forecasts are revised weekly throughout the year. The FM as part of his other accounting and financial planning functions consolidates the various bottom-up forecasts and presents the results weekly to the Finance Director for review. The FM and the FD are compensated to the levels of R700/\$100 thousand and R1 million or \$143 thousand respectively. The FD, depending upon the revenue growth goals of the firm, agrees or declines to “*operationalize*” the forecasts. In the event of the former, the FD reports the forecasts to “national management”. In the event he declines, the forecasts are sent back to the line business unit managers. There are nine business units. The line managers may or may not increase the levels of their original forecast as they may or may not be capacity constrained by the number of field systems consultants available or fully trained to fulfil customer orders. This process is depicted in Exhibit 5.4:

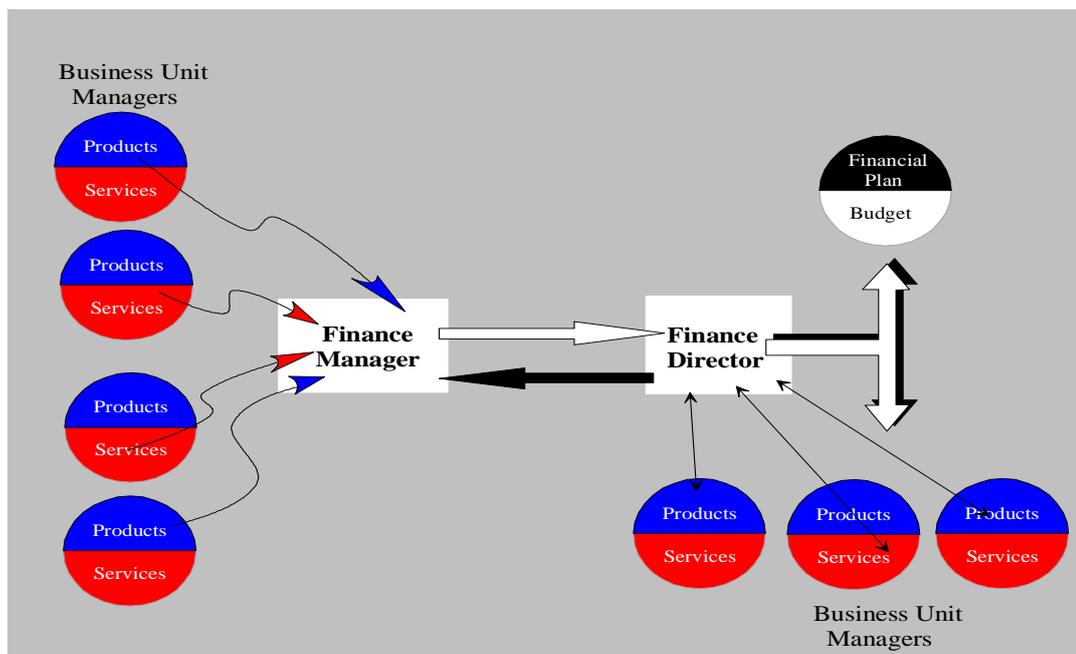


Exhibit 5.4: Networks plc Reported Forecasting Process

Individual details of Networks’ forecasting practices are appended as Exhibit A.4:

Case 5 – Retailers Ltd:

Retailers operates 20 business units in the retail furniture and appliance market. It employs over 15,000 people in six Southern African countries who manage over 1,000 retail stores selling 13 branded products. The firm's revenues grew by over 70% in FY06 and its GGR over the last five years has been 39% per annum. A major portion of this growth has not been organic, rather acquisition driven. The forecasting function of the firm resides within the finance area of the firm. A 110 minute interview was conducted in the office of the 43 year old Group Treasury and Special Projects Manager who is responsible for the delivery of consolidated group forecasts. The forecasting function has resided within this department for the last 10 years and receives forecast information from 25 business unit (BU) managers typically holding bachelor's degrees in commerce/business. The BU and group managers' forecasting activity constitutes a very small component of their job descriptions. These managers are compensated to the average level of R450/\$64 thousand per year while the Directors earn R650/\$93 thousand per year. The firm only manufactures a very small percentage of its own products and instead relies on a number of suppliers for providing forecasted products. The firm reports it utilises a Sales and Operations Planning process (S&OP) but not a Collaborative Planning Forecasting and Replenishment process (CPFR) to ensure the correct mix and volume of products are supplied to its stores. Operational volume and nominal/monetary forecasts are generated for 12 month and four quarter rolling periods while income statement items are forecasted for three year horizons. Forecasts for existing products are generated at the business unit level utilizing short term usage based '*simulator*' software and managerial judgement. Financial forecasts are generated in a similar fashion. The firm reports that forecasts have exceeded recorded sales actuals by 5% on the average at the product category level over one month and one quarter horizons. However, independent analysis of the firm's income statements and balance sheets for FY05 and FY06 reveal stock turns statistics inconsistent with the reported accuracy level. The process Retailers adopts to generate its forecasts involves a bottom-up submission of the business unit forecasts at the product volume and monetary levels to the group holding firm. The latter in turn generates a high level top-down monetary financial item forecast in nominal/monetary terms and compares its forecast to comparable business unit submissions. The top-down forecasts prevail over the bottom-up submissions. Flow chart depiction of this process is very similar to that of Networks plc. with the exception of the top-down forecasts prevailing. Individual details of Retailers forecasting practices are appended in Exhibit A.5.

Case 6 – Ebriete plc:

Ebriete is a beverage manufacturer, distributor and third party bottler operating in over fifty countries and six continents. It employs over 50,000 people worldwide with a payroll level close to R14/\$2 billion in FY07. During the same period its sales revenues grew slightly over 20% and by a GGR of 23% annually over the last five years. A forecasting function has existed at the firm for over 15 years employing 11 people in FY07. The forecasting function resides within the logistics

unit of the firm. A 90 minute interview was conducted at the office of the 'Manager of the Logistical Planning Department' of the South African unit of Ebriete, Plc namely Ebriete Ltd. The latter unit is the central location and 'clearing house' for worldwide operations. The respondent is in his early forties and hails from an operations consulting background at a 'big six' accounting and consulting firm. The focus of the interview was at two levels, the low level volume forecasting and high level aggregate sales revenue forecasting. The forecasting process for the latter level consists of the operating committee (OC) of Ebriete Plc setting growth targets for each of their operations for the next three to five years. The Plc operating committee is comprised mainly of MBAs with engineering backgrounds, a single chartered accountant and a single director with an economics background. The average age of the group is 50 years ranging from 43 to 56 years. The targets set by the Plc OC are communicated back to an Ltd cross functional management group (FMG) via the MD of the Ltd who sits on the Plc OC. The FMG meets time and again during a quarterly period and develop a draft bottom-up business plan. The draft plan is then presented to the Ltd board and is reconciled back to the OC targets by the FMG performing gap and SWOT analysis. The final business plan is then presented to the Ltd board and agreed upon. The Ltd MD then takes the plan back to the OC for final agreement. Once agreement is reached at the Plc OC level the plan and forecasts are communicated back to the various business units and the year 1 plan and forecasts are used for operational planning purposes. It is reported that this process has generated forecasts that have varied by an average 8% against actual revenues for monthly horizons and by 10% for quarterly and annual horizons at the business unit level. With respect to volume forecasting at the SKU and product category levels, the process revolves around each of 10 forecasters (called 'Demand Planners') generating time series and judgmental forecasts in support of monthly business unit operating plans. Over 300 forecast items (SKUs, product packages, product categories and new products) for each of 80 distribution points are generated. The time series forecasts are generated from PC based commercial forecasting software package with ARIMA, Smoothing, Decomposition and other rudimentary functionality. This 'forecast engine' is fed with historical time series data by an SAP accounting system residing on numerous servers. In the case of new products without any historical data, the forecasters apply Analog techniques in addition to judgmental approaches. *Ad hoc* econometric and price elasticity analysis is sourced outside the forecasting department from external consultants or internal marketing consultants. SKU forecasts vary on the average by 46% when measured using the MAPE formula for one month horizons and by 80% for 12 month horizons. Product category MAPEs are between 15 and 20% for monthly horizons, 20 to 30% for quarterly horizons and 50 to 60% for 12 month horizons. It is reported that the staff forecasters are incentivised for forecast accuracy above their base R450/\$64 thousand annual salary. This incentive also applies to the forecast manager's base salary of R600/\$86 thousand. Once the 'Demand Planners' have completed their analysis the volume forecasts are sent to the 'Production Planners' who develop a 'full supply chain plan' containing an MPS, MRP, MSP and inventory plan. A SAP SEM budgeting tool is used to convert the volume enumerated forecasts into monetary forecasts. The monetary level forecasts are then passed onto the business units

operational functions to reconcile to the business plan provided to them from the Plc OC. Both processes are illustrated in Exhibit 5.5:

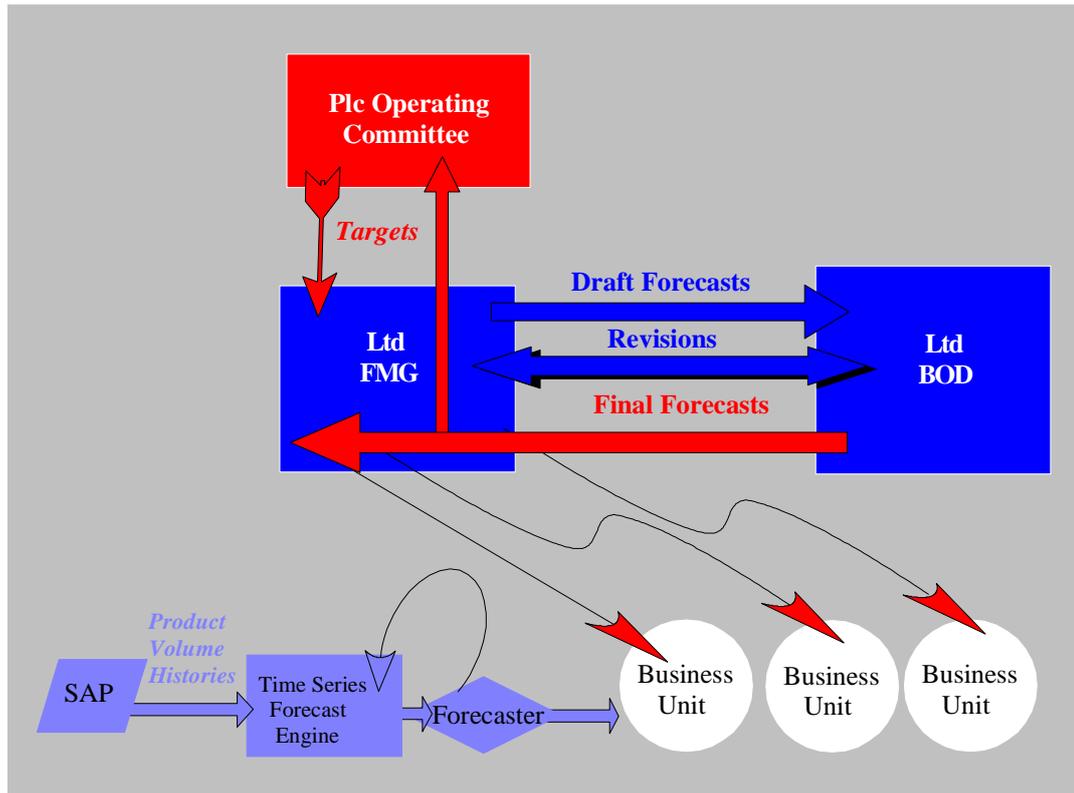


Exhibit 5.5: Ebriete plc Reported Forecasting Process

Supplementary details of Ebriete’s processes and other categories of their forecasting practices are appended as Exhibit A.6:

Case 7 – Canteens (Pty) Ltd:

Canteens is a privately owned food catering concern that has been operating in the domestic out-sourced catering market for over 30 years. Canteens reports it employs over 6,000 people and serves over a million meals daily to its customers that range from large corporations to educational and healthcare institutions and industrial, construction and mining concerns. It does not operate nor has it ever operated a forecasting department. Similarly, it has never hired a professional forecaster nor an employee with professional forecasting credentials or experience. Its forecasting activities are conducted within its operations departments by R84/\$12 thousand a year analysts with matric certificates/high school diplomas and R280/\$40 thousand a year senior analysts with bachelor’s degrees. These analysts use judgmental forecasting techniques to compile rolling 12 month and 3 year, annual monetary sales forecasts. The 3 year annual forecasts are revised every year. The firm reports the forecasts, at all categories (product/service/firm), vary from recorded actuals by 10% over the 30 day and 90 day horizons and by 15% over the one year horizon. The analysts use server based enterprise resource planning software to extract current and historical sales data for

analysis. The analysis is also conducted using PC based off the shelf spreadsheet software. The forecasting process used at Canteens consists of three steps. Firstly, the analyst derived bottom-up monthly forecasts are submitted to the various operations managers (OMs). The latter then review, amend and/or forward the forecasts to the Divisional Finance Manager (FM) and Divisional Director (DD). Lastly, monthly forecast meetings are held with the CEO, FD and OMs *“to compare performance against budget, performance against forecast and to agree (and adjust if necessary) the forecast going forward.”* The CEO is in his early fifties and it is reported *“he has a strong financial background”*, while the FD is a 40 year old Chartered Accountant. The modal credential of the OMs is a diploma in hotel and catering management. The forecast process is distinct from the budget process which consists of four steps. In step 1 the CEO establishes overall growth and financial targets with shareholders and Board of Directors (BOD). The FD and CEO agree upon divisional targets and communicate them down to the divisions. In step 2 the divisional FMs compile divisional budgets from bottom-up information provided by Operations Managers and heads of support departments. If targets are not met the divisional directors will agree upon methods of adjusting the budget so that it does provide the required profit contribution. In step 3 the budget is presented to the full BOD by each divisional management team, is debated and accepted or adjusted as agreed. In step 4 the company budget is compiled by the FD and presented by the CEO to the shareholders. In the context of forecasting practices budgeting activity is anecdotic. On point are the individual details of the firm’s forecasting practices appended as Exhibit A.7.

Case 8 – Maritime Ltd:

Maritime is a publically traded holding firm with its principal operations encompassing the owning, leasing and managing of marine cargo containers for a worldwide customer base. The firm contributes over 8% of the total market capitalization of the Industrial, Goods, Services and Transportation industry/sector listings on the JSE. The GGR of Maritime’s sales revenues has been over 35% annually from an FY02 base of R589/\$84 million. Maritime employs over 400 people worldwide. A 100 minute interview of the firm’s Financial Director (FD) and Financial Manager (FM) was conducted at its head office. The FD and FM are 61 and 49 years of age respectively. Both are Chartered Accountants. The FD is compensated to the level of R1 million or \$143 thousand annually while the FM earns R700/\$100 thousand during the same period. The forecasting process practiced by the firm consists of four phases. At the first phase, the field operations managers provide their bottom-up sales revenue forecasts, enumerated in monetary terms, to the division’s CFO. The firm has never established a formal forecasting department nor hired a professional forecaster or manager with forecasting credentials. The bottom-up forecasts are all judgmentally derived by the logistics/operations managers who hold bachelor’s degrees in finance or marketing. Tools used by these managers to develop the forecasts are PC based spreadsheet and graphics software packages. The firm reports operating forecasts at the product/service category levels vary from recorded actuals by an average of 20% over a one quarter horizon. Forecasts are generated for 36 monthly periods and are revised on a quarterly basis. At the second phase of the forecasting proc-

ess, the division CFO will consolidate the individual forecasts into a group financial forecast and report and will then present each to the CEO and the Executive Committee (EC). The EC consists of three attorneys (one with an MBA) and a Chartered Accountant. The average age of the EC is 66 years with the eldest member at 73 years and the youngest at 59 years. At the third phase of the forecasting process, the EC will review these consolidated reports and will (a) request that the CFO effect some minor changes to the reports or (b) refer the reports back to the operations managers for reconsideration or (c) accept the reports in the form presented. At the fourth phase of the forecasting process, the CEO and/or EC, when satisfied with the reports, will cause them to be circulated to members of the board of directors in advance of a meeting of the board, together with a written report from the CEO. The board of directors will consider the report and forecasts and the significant underlying assumptions and will (a) accept the forecasts and budgets as presented with or without reservation or (b) refer the forecasts and/or budgets back to the CEO and his team for further work. In this latter event, the board would reconvene to reconsider the amended forecasts and budgets. The process described above is illustrated in Exhibit 5.6:

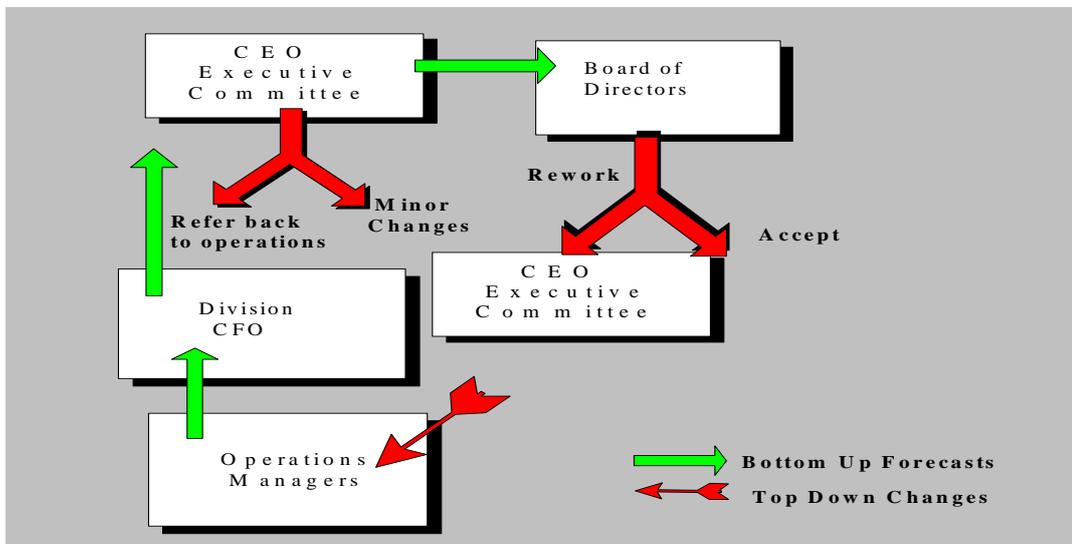


Exhibit 5.6: Maritime Ltd Reported Forecasting Process

Further details of the forecasting practices of Maritime are appended in Exhibit A.8.

Case 9 – Greige Ltd:

Greige has been a publically traded clothing retailer and manufacturer for over 50 years. It currently employs over 1,500 people. This headcount has diminished over the years as the firm has progressively reduced its manufacturing capacity by shutdowns and consolidations. This segment of the business continues to languish due to reported labour and productivity problems. The retail sector of the business has not fared any better with declining sales revenues over the last three fiscal years. Its GGR over the last five years has been -0.3% annually. A 75 minute interview was conducted at the firm’s offices with the CFO, a very nervous 38 year old chartered accountant. The

firm has never operated a forecasting department nor has it ever employed a professional forecaster or a manager with forecasting skills or credentials. Forecasting activity at the product volume level is conducted within the Supply Chain department of the firm. This has occurred for the last five years with three employees devoting 70% of their time solely to forecasting activity. The employees, a manager, a senior analyst and an analyst are paid R360/\$51 thousand, R240/\$34 thousand and R120/\$17 thousand respectively. The analyst holds a matric certificate and the senior analyst and the manager each hold bachelor's degrees and offer operations experience. Forecasting methodologies practised are judgemental in the main with *ad hoc* surveys also being conducted. All forecasting analysis is conducted with PC based spreadsheet software. The CFO reported that forecast accuracy was monitored but could not provide variance measures at the time of the interview and indicated "*I will revert to you with the info however I have other priorities currently. Sorry for the delay.*" The 'info' was not provided to the study and was not pursued. At the high level of sales revenue forecasting it is reported that the CEO and Executive Director of Marketing (DM) determine and develop the forecasts subjectively. The CEO is a 39 year old and the DM is 62 years old. Both ladies possess Bachelor of Arts degrees. The reported forecasting process adopted by Greige consists of the aforementioned executives caucusing and collectively determining the operational and financial targets of the firm. Both executives report to a 67 year old non-executive chairman of the board who holds diplomas in general law and tax law. Considerable information provided by the respondent during the interview process is not supported by other forms of evidence such as publically filed financial statements and industry journal reports. These discrepancies are highlighted in yellow in the detailed investigation results summary appended as Exhibit A.9.

Case 10 – Boisson Ltd:

Boisson is a domestic and international producer, marketer and distributor of alcoholic beverages. Its international operations are located in Canada, the USA, Europe, the UK and Japan. Its shares are publically traded on the JSE through its wholly owned investment subsidiary. A 90 minute interview was conducted at the firm's offices with its International Marketing Director (DM). Boisson established a forecasting department a year ago consisting of a \$360/\$51 thousand analyst, a R600/\$86 thousand senior analyst and a R720/\$103 thousand manager. The forecasting department is located within the Sales and Marketing function of the firm. Forecasts are generated at the product SKU, category and firm level both in volume and monetary terms. The forecast horizons are 12 months and three years which are revised every quarter. Forecast variances are reported as 10%, 5% and 5% over 30, 90 and 360 days horizons for SKU, category and total firm levels, respectively. Independent examination of the firm's financials for the last two fiscal years show stock/inventory levels average R837/\$120 million which computes to an average of 67% of sales revenues for the same period. Industry publications report that the Executive Director of Production resigned from the firm in mid FY07. The reported forecasting process practised by the firm consists of a bottom-up and top-down phase. The former phase entails the wholly owned domestic

and international operating entities submitting their independent forecasts to the Manager of the Forecasting Department. The latter then compares these forecasts to the times series forecasts generated by his staff, attempts to reconcile differences and then presents the best efforts resultant forecasts to the CEO, the FD and other members of an Executive Committee (EC). The latter then either amend or accept the forecasts. Amendments revert back to the operating units which may or may not result in changes to their original forecasts. The EC accepted and approved forecasts are then presented to the Board of Directors (BOD) who in turn present same to the shareholders. The BOD rarely make changes to the CEO/EC presented forecasts. The shareholders do not explicitly make changes to the forecasts. They did however vote in FY07 not to re-elect the Chairman of the Board. The forecasting process described above is shown in Exhibit 5.7. A detailed results summary of most of the evidence mined during the interview process and examination of other documents of the firm is appended as Exhibit A.10.

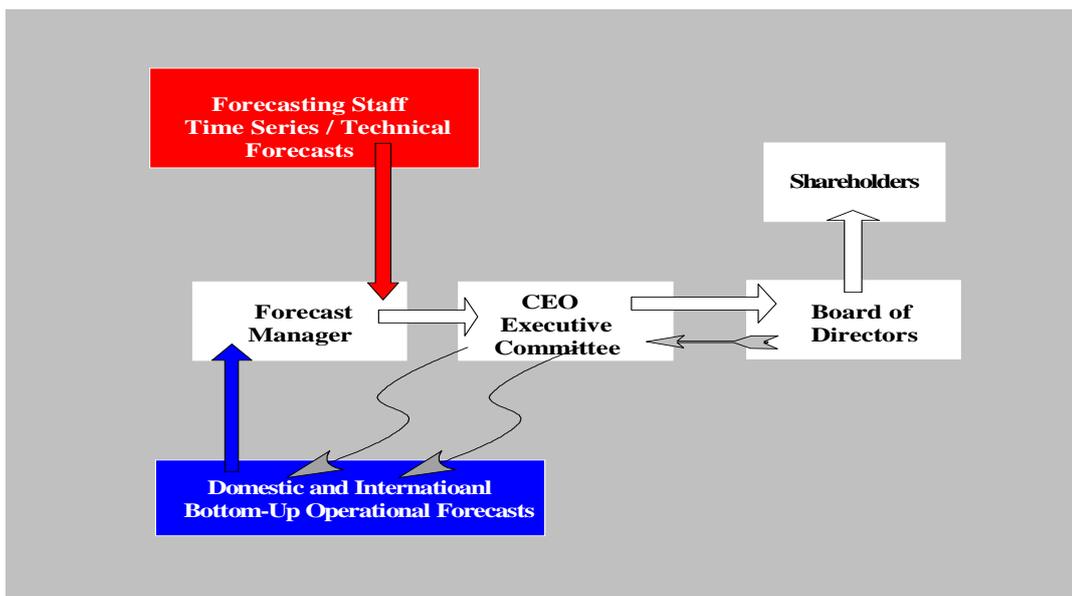


Exhibit 5.7: Boisson Ltd Reported Forecasting Process

Case 11 – Merchant Ltd:

Merchant operates a chain of over 350 retail clothing, food and general merchandise stores in Southern and Central Africa, the Far East and Australia. The firm employs over 15,000 people in the above mentioned regions. It is a publically traded listing on the JSE with a market capitalization in excess of R13/\$1.8 billion. Its sales revenues grew by 23% in its last fiscal year and the GGR of the same measure has been approximately 16% annually for the last five years. A 115 minute interview, focussing mainly on its operational forecasting practices, was conducted with the firm's Merchandise Planning Manager (MPM). The MPM reports that a forecasting department, placed within the operations department, has been in existence for the last five years. The department employs a total of 35 people consisting of forecasters/'planners' and forecasting managers /'planning managers' who devote 70% of their time to *bona fide* forecasting activities. The

latter are compensated to the level of R500/\$71 thousand per year while the former earn R350/\$50 thousand a year. Most of the staff hold bachelor's degrees with emphasis in the mathematics and statistics subject areas. Server and PC hardware hosting the Oracle Inc.'s Retail Demand Forecasting (RDF) application software are the principal hardware and software tools utilised by the staff in their forecasting activities. RDF employs a suite of time series, regression and combination of techniques to determine minimum variance forecasts. The MPM reports an incentive programme, boosting salary levels reported above, is in place to improve forecast accuracy. Bonuses are based on the calculation of WMAPEs or the weighted mean absolute percentage error accuracy measure for each SKU generated by the forecaster. Reported average WMAPEs are 40% over 30 day horizons for both SKUs and product categories. MAPE (mean absolute percentage error) for the firm as a whole is reported at 2% over a 30 day horizon. Operational forecasts are prepared and revised weekly for daily forecasts periods over an 18 month horizon. Approximately 6,000 SKUs and one million SKULs (SKUs at different locations) are forecasted. The weekly operational forecasting process practiced by Merchant consists of a bottom-up and top-down component. The former entails the forecasters/'planners' generating, reviewing and adjusting the computer system generated statistical forecasts. These forecasts are then consolidated and presented to the forecasting managers/'planning managers' who perform their own review and *ad hoc* adjustments. Upon completion of this exercise the 'final' consolidated forecasts are then presented to the MPM who in turn performs his own review and *ad hoc* adjustments. The top-down phase of this process is reported as the planning managers and the MPM "*requesting that the planners make changes to achieve certain levels*" consistent with their respective *ad hoc* adjustments. Despite having SKU average selling price data available, no formal exercise of reconciling consolidated volume based forecasts with top-down monetary forecasts, is undertaken. Individual stores also provide 'top-down' input with respect to promotional items that will be sold in their respective stores. This process is illustrated in Exhibit 5.8:

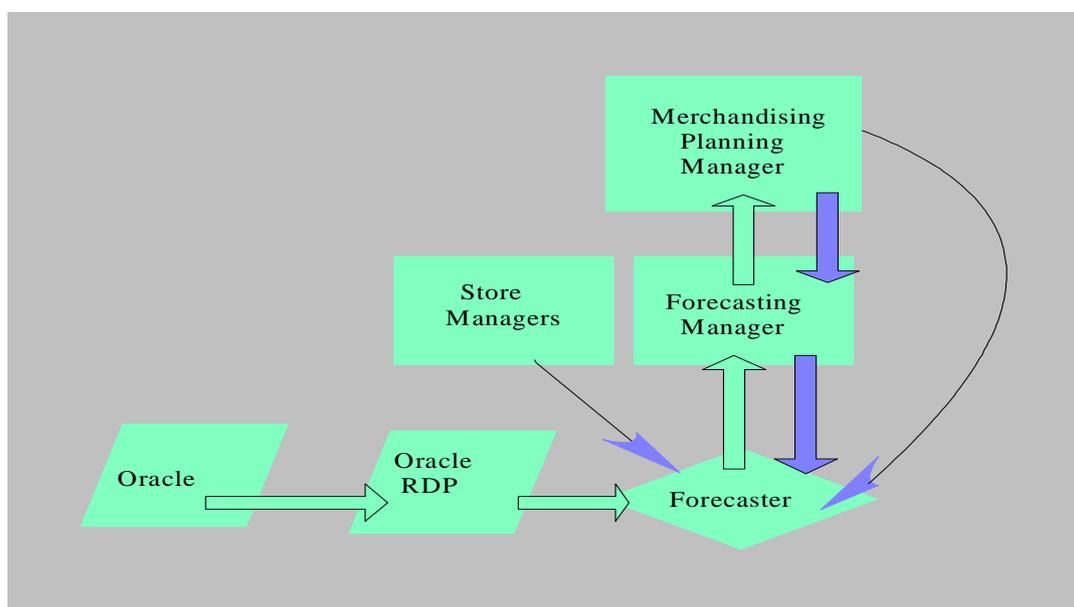


Exhibit 5.8: Merchant Ltd Reported Forecasting Process

Exhibit A.11 in Appendix A provides additional details to the process findings as well as other forecasting practices at Merchant:

Case 12 – Enivre Group Ltd:

Enivre is a domestic alcoholic spirits and beverage producer that markets, exports and distributes its products in Africa, North and Latin America, Europe and Asia. The firm employs over 4,000 people domestically and contributes over R12/\$1.8 billion in market capitalization to the consumer food and beverage sector/industry of the JSE. Revenue growth of the firm exceeded 18% in FY07, its highest rate of growth over the last six years.

An in depth interview focussing on product volume forecasting practices was conducted with the group's Planning and Control Financial Manager. The interview lasted approximately two hours. A forecasting 'department' is reported to have been in existence for over 20 years at the firm and consists of six employees. Although this function is located within the operations/production function of the firm it is considered to be unbiased in its bottom-up time series forecasting of over 600 SKUs. These activities are aided by the use of SAP APO demand planning tools and PC based spreadsheet software. Product volume forecasts are generated over horizons of 18 monthly periods and five year annual periods. Monthly forecasts are revised each month and the five year outlook is revised each year.

Volume forecasts are reported to vary from recorded actuals by an average of 33% over a 30 day horizon at the SKU level. Aggregate firm level monetary forecasts are reported to vary from recorded revenues by 3% over a 30 day horizon and by 20% over a one year horizon. The firm's inventory to sales ratio was 41% in FY02 and declined to 34% in FY07. The GGR of this ratio has declined at an annual rate of 4.7% over the last five years.

An incentive plan, based upon forecasting accuracy, supplements the annual base salary of R350/\$50 thousand of the four forecasters and the annual base salary of R500/\$83 thousand of the forecast manager. This group reports to the director of operations earning R800/\$114 thousand annually.

The forecasting process practised by the firm starts at the beginning of the year with the preparation of 'functional' or operational unit level 'baseline' volume forecasts and the conducting of a series of meetings between the forecasting staff and those units to reach agreement. This section of process is depicted in Exhibit 5.9:

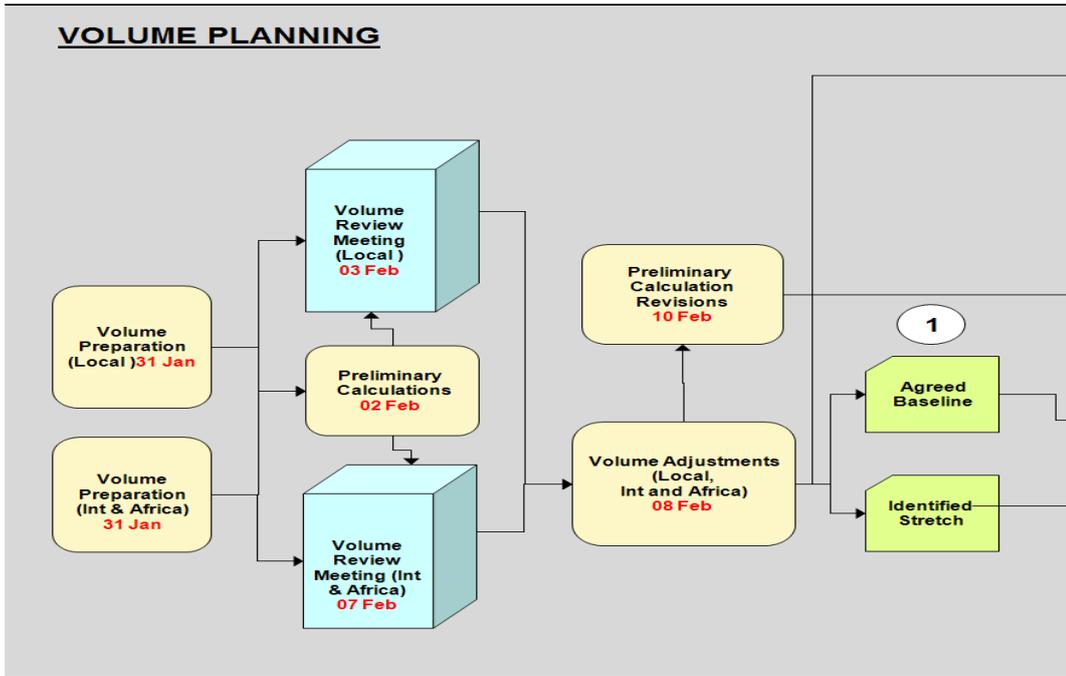


Exhibit 5.9: Enivre Group Ltd - Functional Level Baseline Agreement Section

The next stage of the process revolves around the functional units considering ‘stretch’ or opportunistic business not reflected in the historical data and time series analysis. Upon completion of this consideration the forecasts are consolidated into business segment forecasts and similar agreement reviews and additional ‘segment stretches’ are entertained. The resultant forecasts are delivered to the production and logistics departments and a high level review meeting of finance, operations and logistics is conducted in February of each year. This section of the process is depicted in Exhibit 5.10:

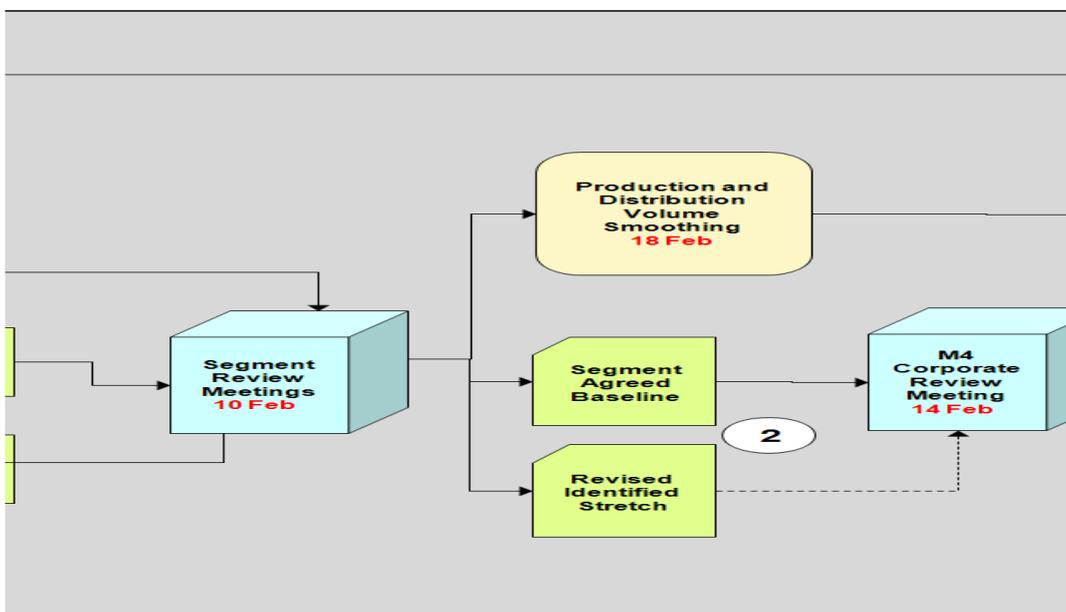


Exhibit 5.10: Enivre Group Ltd - ‘Stretch’ and Segment Review Section

Upon the approval of the segment baseline forecasts and any adoption of ‘stretches’ the operational budgets and draft segment business plans are compiled. The latter are reviewed, revised and finally agreed upon resulting in segment budgets being compiled. At the same time, preliminary five year plans are prepared and reviewed. The last section of the volume forecasting process evolving into the start of the business planning process is depicted in Exhibit 5.11:

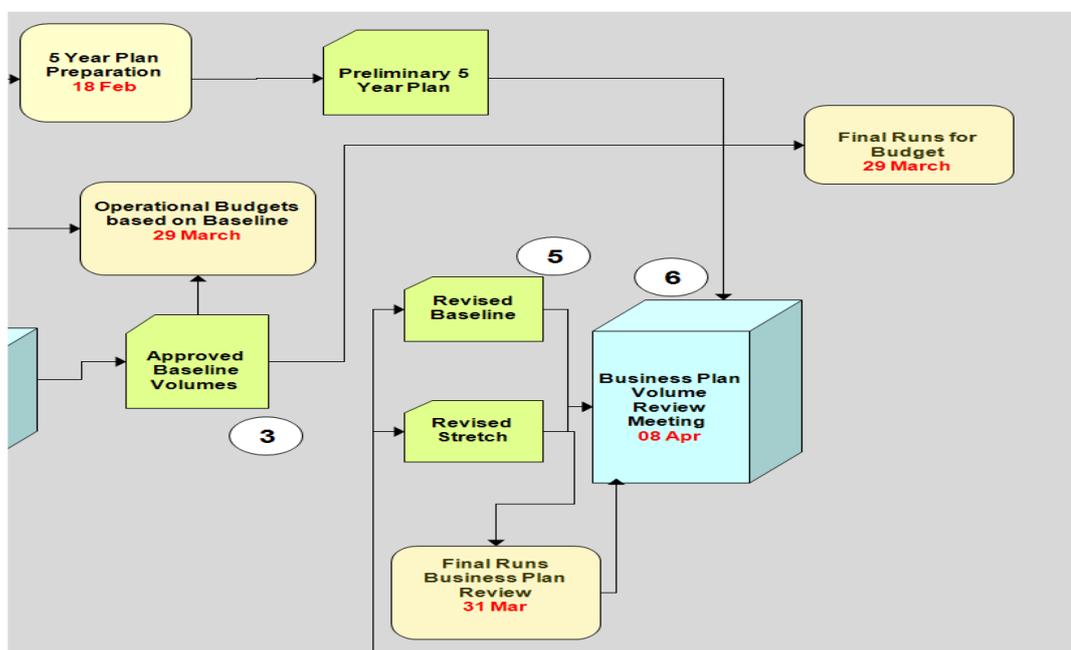


Exhibit 5.11: Enivre Group Ltd - Final Forecast and Business Plan Review Section

Supplemental to the above synopsis and process charts of Enivre, Exhibit A.12 in Appendix A provides individual details of their forecasting practices and process.

Case 13 – ATM Group Ltd:

ATM is one of the largest financial and banking service groups in South Africa employing over 35,000 people in over 700 physical service outlets. Interest income reported in FY06 exceeded R35/\$5 billion reflecting growth of over 28% from the previous year. An interview lasting over two hours was conducted with managers of two separate segments of the retail business unit of the firm of a particular geographical region. One of the segments services the banking and wealth management needs of wealthy clientele and the other the banking needs of average to low income customers. The focus of the interview was operational or interest revenue forecasting practices in both segments of their particular service region. Three managers in total were interviewed, one representing the wealthy business segment (WS) and the other two the low income segment (LS). All three managers reported that segment practices and operations in their region were typical and representative of practices in all other regions of the firm. The WS representative holds the title of ‘Financial Planner’ and the representatives of the LS are ‘Branch Managers’. It is reported that no formal forecasting functions have existed in the various regions of either business segment. Instead

each segment employs one person to conduct operational forecasting as part of many other staff functions. This person typically earns R400/\$57 thousand annually and reports to a regional segment sales manager earning R750/\$107 thousand annually. Interest revenue forecasts are generated using rudimentary time series techniques (simple trend and averages) for weekly and monthly periods over a one quarter and one year horizon in the LS segment. Forecasts are revised quarterly. Forecasts vary from recorded actuals in the LS by 6%, 19% and 65% over the one month, one quarter and one year horizons respectively. Forecasts vary from recorded actuals in the WS by 20%, 10% and 10% over the one month, one quarter and one year horizons respectively. The forecasting process adopted in both segments starts with the regional segment forecasters compiling interest revenue forecasts at the sub-regional level with input from private and retail and financial planners. These forecasts are consolidated at the regional level within each segment and are then submitted to the business unit Executive Committee (BUEC). The BUEC in this case consists of a 46 year CEO with a bachelor's degree in economics, a 43 year old Chartered Accountant, a 49 year old without any degree and a 39 year old with a bachelor's degree in science. The latter three members all hold the title of 'Executive Director'. The forecasts and business plans reviewed and approved by the BUEC are submitted to the firm's board of directors who in turn submit same to the majority overseas shareholder. The latter review the forecasts and plans and in the event strategic goals or 'ambitions' as set by the shareholder are not met, these 'ambitions' are sent down through the 'chains of command' for adjustment. The top-down 'ambitions' prevail over the bottom-up regional and segment forecasts. The above process is depicted in Exhibit 5.12:

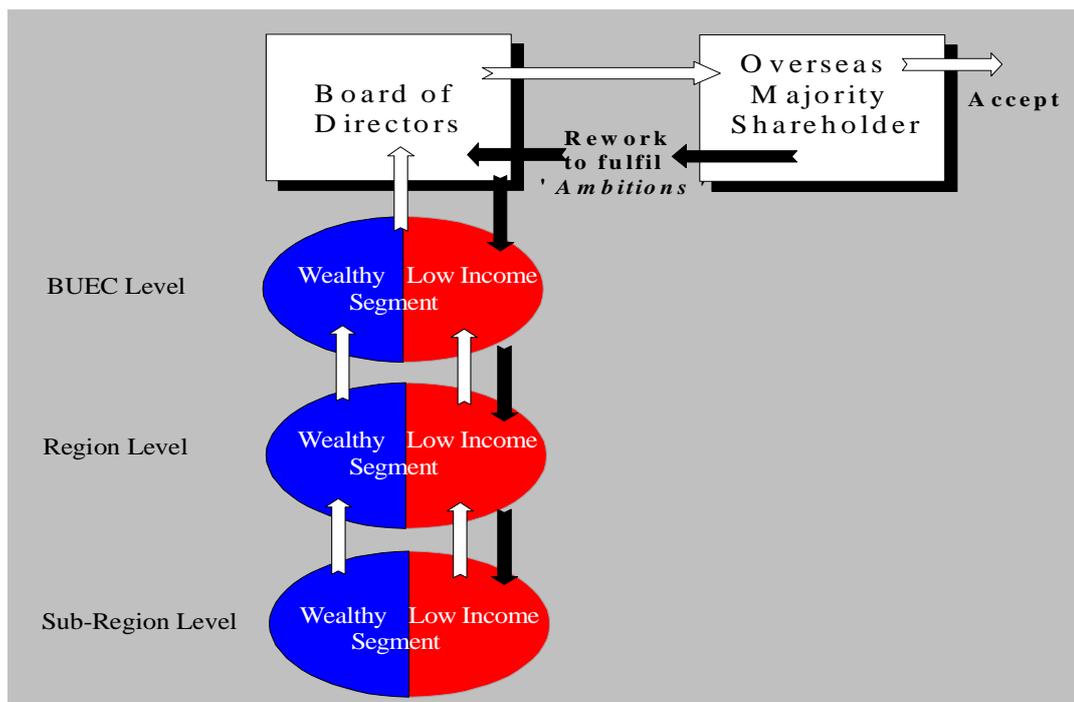


Exhibit 5.12: ATM Group Ltd - Reported Forecasting Process

Individual details of the forecasting practices of the wealthy business segment (WS) are appended as Exhibit A.13 and as Exhibit A.14 for low-income business segment.

Case 14 – Nightingale Group Ltd:

Nightingale is one of the largest private hospital operators in Southern Africa holding a strong 23% market share of the private hospital service industry. The firm employs over 10,000 full-time employees in 50 hospitals and provides nearly 7,000 beds and over 200 operating theatres for private patient usage. The firm has been in business nearly 25 years. The main business variables the firm forecasts are hospital bed usage measured in days (bed days) and operating theatre usage measured in minutes (theatre minutes). To investigate these and other forecasting practices at the firm, a 90 minute interview was conducted with the firm's group head of financial services. The latter reports the firm does not and has never had a forecasting department and none of its employees engaged in forecasting are professionally trained or experienced forecasters. Instead the forecasting of bed and operating theatre usage is conducted by hospital operations managers and/or the various hospital managers/administrators. These managers forecast usage 12 months into the future for monthly operating periods and revise their forecasts every 90 days. These managers, having no formal forecasting training, rely on their own judgments and experience and use PC based spreadsheet software to manage the numbers. Reported forecast variances measured against actual bed days and theatre minutes usage average 10%, 7% and 5% over 30, 90 and 360 day periods respectively for individual hospitals and 8%, 5% and 4% for 30, 90 and 360 day periods respectively for all hospitals aggregating into totals for the firm. The firm does not pay bonuses to the employees developing the forecasts for increased forecast accuracy. The base salaries of these employees range from R130/\$19 thousand to R600/\$86 thousand. The low end of this range reflects operational or financial analysts at a particular hospital generating the forecasts compared to the operations or hospital managers at other hospitals compiling the forecasts. There is no consistency across the hospitals as to the staff level of employees developing the forecasts. The forecasting process employed by the firm is very much a bottom-up exercise with the hospital operations and general manager driving the process with their judgmental forecasts. These forecasts are consolidated at the group level in volume terms and are also converted into monetary measures through the application of group level determined prices. Nightingale's practice details are summarised in matrix form in Exhibit A.15 in Appendix A.

Case 15 – Dinero (Pty) Ltd:

Dinero is a private asset management and investment consulting firm. It manages over R8/\$1.2 billion in assets with 11 full time and four freelance investment professionals. The firm has been in business for 12 years. The professional backgrounds of the full time staff range from equity analysts to portfolio managers to hedge fund managers to derivative analysts. The firm has a chartered accountant and an attorney on staff. The academic qualifications of the staff range from bachelor's degrees in actuarial science, economics, accounting and master's degrees in economics. Various staff members are in the throes of CFA accreditation. A 60 minute interview with the head of the investment research department was conducted to investigate the firm's forecasting practices with

respect to the prediction of Dinero's own revenues whether in the form of interest or consulting fees earned. Forecasting of financial instruments or client positions and portfolios were not investigated. Due to the size of the firm, Dinero does not operate a formal department with the mandate to forecast the various activities of its business. One of the principals of the business has been addressing this requirement for the last 11 years. This individual is located within the finance area and generates fee and earnings forecasts for monthly periods over a three year horizon. He revises the forecast every 90 days. Time series techniques, mainly decomposition algorithms are computed in PC based spreadsheets. These methods are supplemented with judgemental survey methods. It is reported that forecasts vary from recorded fees and earnings actuals by 15% over a 90 day horizon and by between 25% and 30% over a 360 day horizon. An informal and consultative forecasting process is adopted by the firm consisting of the 'forecaster' consulting with the principals and fee generating members (section heads) of the firm, tallying the projected fee generation outlooks and informally discussing any differences between the two entities. This 'forecasting process' is not a separate process from the budgeting process, rather they occur at the same time and are synonymous. Dinero's practice details are summarised in matrix form in Exhibit A.16 in Appendix A.

Case 16 – Libris (Pty) Ltd:

Libris is one of the largest leading publishing groups in Southern Africa. It publishes newspapers, magazines and books in print and electronic media. It also operates private education institutions, printing plants and internet and distribution firms. Sales revenues of Libris exceeded R5 billion/\$714 million in FY07. The 36 year old publisher of the magazine division of the firm was interviewed over a 100 minute period. The finance manager of the division also participated in the interview. The focus of the interview was the firm's practices with respect to subscription, circulation, advertising, distribution, book publishing and e-commerce revenue forecasting. The firm does not support a forecasting function nor does it have an employee devoted to the development of forecasts. Instead forecasts are compiled by numerous different departments within the firm. These departments are finance, sales, strategic planning, marketing and operations. The senior management of the firm is viewed as '*rhetorically*' supportive of forecasting activities within the firm. Revenue forecasts are generated for a three year horizon, the first year for monthly periods and the two subsequent years for quarterly periods. These forecasts are revised every quarter. Forecasting methods used are mainly survey techniques although regressions are run occasionally. Forecast variances are tracked by the business segments of Print, Electronic and Education. For the Print segment forecasts vary from recorded actuals by 15% to 20%, 10% to 15% and by 20% over 30, 90 and 360 day horizons respectively. For the Electronic segment forecasts vary from recorded actuals by 5% to 10% over 30, 90 and 360 day horizons. For the Education segment, forecasts vary from recorded actuals by 25% over 30 and 90 day horizons and by 30% to 40% over the 360 day horizon. Employees in the various different departments compiling the subject forecasts as part of all their other responsibilities and duties earn between R200 and R500 thousand or \$29 and \$71 thousand per year. The highest level of education attained by these employees is a bachelor's de-

gree. The forecasting process practised by the firm consists of the General Managers (GMs) and Operational Managers (OMs) of each division submitting their operational forecasts to the divisional Financial Manager (FMs). The forecasts are reviewed by the FMs and submitted to the group CFO for “comment”. Any suggestions or changes made to the forecasts after submission to the CFO are reconciled by the GMs, OMs and the Group CEO. All forecasts are consolidated and sent to the 100% owned media holding firm. Any further changes or suggestions at the holding firm level are sent back to the group management for resolution before all the forecasts and plans are sent to the holding firm’s board of directors. This process is shown in Exhibit 5.13:

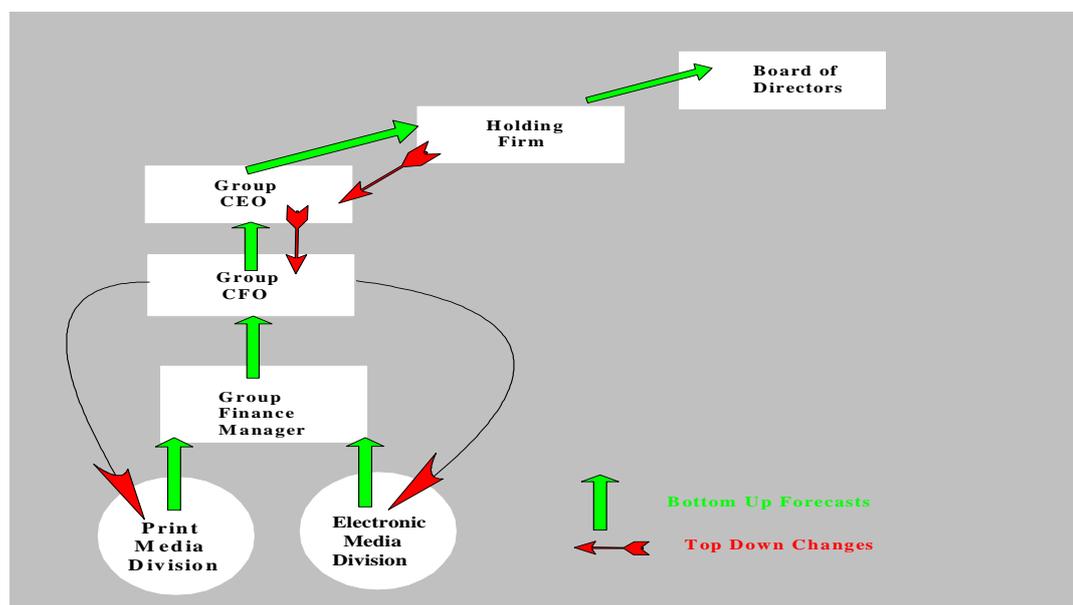


Exhibit 5.13: Libris (Pty) Ltd - Reported Forecasting Process

Supplementary details of the process and other practices are summarised in Exhibit A.17.

Case 17 – Lucre plc:

Lucre is an international financial product and services firms specializing in wealth management and accumulation. As of the third quarter of 2007, the firm had over \$300 billion in the US, over €83 billion in Europe and over R574 billion in South Africa, under funds management. Sales of Lucre’s principal financial products grew by over 12% for the first nine months of 2007 compared to the same period in 2006. The firm employs over 40,000 people worldwide. The head of the Economic Research department, an economist by profession, participated in a 95 minute interview. Lucre has had an established forecasting department for over 30 years. It employs two professional forecasters for the purpose of forecasting economic variables and 12 professional forecasters for the purpose of forecasting equity markets and securities. These forecasters earn on the average R720/\$103 thousand per year. A salary bonus is paid to the forecasters calculated according to forecast accuracy levels achieved. The majority of the forecasters hold a master’s degree in economics and/or mathematics and statistics. The principal economic variables forecasted are GDP,

exchange rates, inflation and interest rates. All the aforementioned variables are forecasted over a three year horizon for quarterly periods, with the exception of inflation which is forecasted for monthly periods. Revisions to GDP, exchange and interest rate forecasts are conducted on a quarterly basis and on a monthly basis for inflation. Exchange rate forecasts vary from actual rates by between 10 to 15% over a quarterly period and by between 10 to 20% over an annual period. GDP forecasts vary from actual economic growth rates by 5% over a quarterly period and by 10% over an annual period. Inflation forecasts vary from recorded actuals by less than 5% over monthly, quarterly and annual horizons. Interest rate forecasts vary from recorded rates by less than 5% over quarterly and by 10% over annual horizons. Methods used in developing the forecasts consist of time series, cause and effect and judgemental methods. Analysis is conducted on PCs utilizing the E-Views econometric software package. Internal customized server based database systems store, retrieve and feed the PC based econometric systems. The Economic Research department is a staff service department whose principal 'customers' are equity analysts, fixed-income analysts and portfolio managers within the Asset Management (AM) business unit of the firm. The forecasting process followed by the AM commences with its strategy analysts providing top-down guidance to equity and fixed asset analysts responsible for selecting strategy compatible instruments in different industries/sectors. Part of this selection process entails generating earnings and yield forecasts of the individual instruments. At the same time the forecasting/economic research department provides macroeconomic forecasts to assist the analysts in their forecast preparation. This collaboration results in collection of strategy compatible instruments being submitted to the AM portfolio managers for consideration. The portfolio managers either agree with the selection or refer individual instruments back to the analysts for reconsideration and/or reconciliation. The reconciled portfolios earnings and yield forecasts are submitted to the CEO of the AM for review. The AM CEO in turn submits the agreed upon positions to the group CEO. It is reported that the CEOs rarely make substantive changes to the portfolio manager submitted forecasts. This process is shown in Exhibit 5.14:

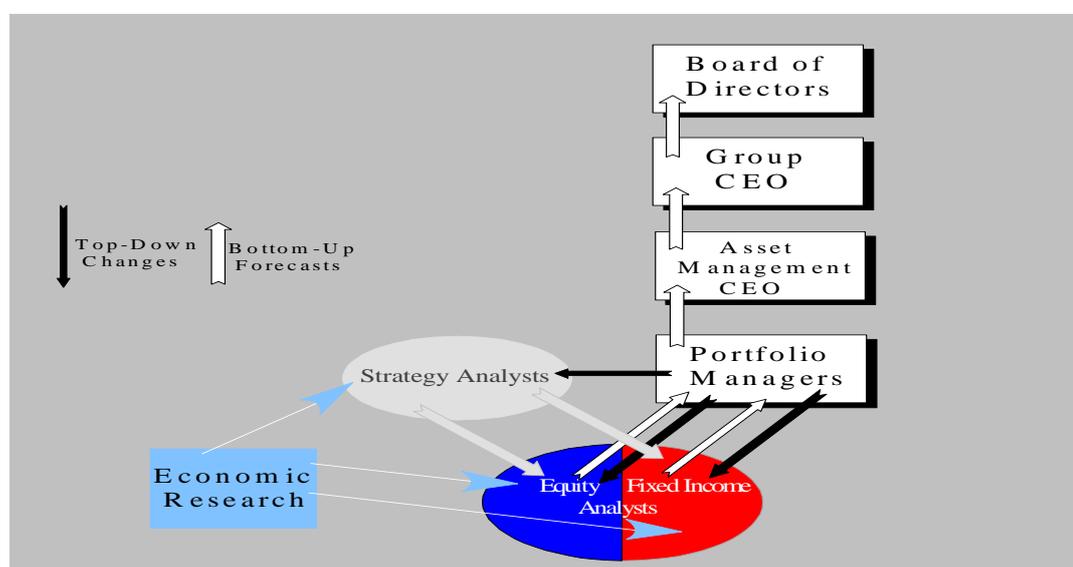


Exhibit 5.14: Lucre plc – Asset Management Reported Forecasting Process

Additional evidence mined from the Lucre interviews is presented in matrix form in Exhibit A.18.

Case 18 – Neptune Group Ltd:

Neptune is a domestic producer, processor, procurer and storer of fish food products. The firm contributes over 12% of the market capitalization of the food producer/product sector of the JSE. Over 1,000 permanent and 1,000 seasonal staff are employed by the firm. Sales revenues of the firm exceeded R2.5 billion/\$357 million in FY07. The firm does not have a forecasting department nor any professional forecasters on staff. A long interview was conducted with a senior staff member ‘most extensively involved’ in forecasting activities of the firm. This individual holds the title of ‘Group Accountant’. The focus of the interview was product sales and revenue forecasting practices. Product sales forecasting activity is conducted in the sales, marketing, logistics and operations departments at Neptune. Monetary revenue forecasts are consolidated and compiled within the group finance department. Forecasts are generated for monthly periods for a 12 month horizon and are revised each quarter. It is reported that Sales and Operations Planning (S&OP) is conducted at the firm. All forecasts are generated using judgemental methods exclusively as these methods are believed to be the most accurate for Neptune’s operating environment which is raw material (fish harvests) and production constrained. Product category forecasts are reported to vary from recorded actuals by 15%, 20% and 30% over 30, 90 and 360 day horizons respectively. Monetary revenue forecasts aggregated to the firm level vary from recorded actual by between 5 and 10% over 30 and 90 day horizons, while 360 day variances average 15%. The staff involved in forecasting activities, constituting a small portion of their job descriptions, hail from accounting, finance, marketing and operations backgrounds. Educational backgrounds of the same staff range from high school certificates to chartered accountant designation. Annual full time salaries for employees involved in forecasting activities range from R200/\$29 thousand per year for low level analysts to R750/\$107 thousand for directors.

The process adopted by Neptune commences with the group finance department providing the various operating divisions a list of ‘assumptions’. These assumptions include outlooks on interest rates and growth targets. The operating divisions then compile their revenue and profit forecasts for their respective divisions taking into account TAC (total allowable catch) limits, quotas and other supply constraints. The resultant divisional forecasts are then consolidated by the group ‘forecaster’ for the group accountant who in turn submits the forecasts to the FD for review. Between the ‘forecaster’, the FD and CEO changes to the forecasts may or may not be made. In the event changes are made or issues raised, the forecasts are sent back to the operating divisions for reconciliation. The firm believes the divisions “*know their businesses quite well*” and a few changes have been made in the past as a result of new managers in a particular division “*finding their way*”. The reconciled forecasts are then submitted to the board of directors with the rest of the firm’s financials. Collateral evidence mined from the Neptune investigation is present in matrix form in Exhibit A.19.

Case 19 – Vache (Pty) Ltd:

Vache is 100% wholly owned subsidiary of a European based global producer and distributor of dairy products and fruit drinks. The firm generated over R3 billion or €300 million in sales revenue in its last fiscal year. A one man forecasting department had been in existence for a year at the time of the study interview. This department is responsible for developing forecasts for the 682 product offering of the firm. This department is located within the sales function of the firm and a 115 minute interview was conducted with the department forecaster, holding the title ‘Demand Planning Manager’(DPM). The DPM reports product volume (SKU) forecasts vary from recorded actuals by approximately 23% over the 30 day horizon. Sales revenues at the aggregate firm level vary from reported actuals by 5%, 8% and 15% measured over 30, 90 and 360 day forecast horizons. PC based commercial time series forecasting software, with exponential smoothing, trend estimates and moving average algorithms, is used to generate forecasts for two and three years horizons for weekly and monthly production periods. The forecasts are revised once a month for subsequent month periods as the production volumes are fixed during the current month periods. Forecast accuracy is constantly monitored and documented but no incentive plan is in place based upon improved forecast accuracy or any other performance measure. The DPM reports his annual salary is approximately R450/\$64 thousand. He holds a bachelor’s degree and his business background is in sales, marketing and operations. The product forecasting process at Vache commences with the DPM preparing baseline time series forecasts for a 12 month horizon. It is reported that marketing and customer service managers ‘collaborate’ in the process by reviewing and commenting on the time series forecasts. The nature of their review and comment is to add promotional and other unusual demand to the baseline forecast. National and regional sales managers also participate in the collaboration exercise. All told, 30 ‘forecast collaborators’ add their subjective input to the 3 to 5 month horizon quantitatively derived forecasts. Forecasts over the 13-28 month horizon are generated through the application of rudimentary product class growth rates. A within-case summary of complementary and supplementary evidence mined during the Vache investigation is shown in Exhibit A.20.

Case 20 – Damas Ltd:

Damas is one of the largest food and household product retailing firms on the African continent. It operates over 1,000 stores in over 17 countries on the continent. The firm has over 60,000 full-time employees of which over 1,200 hold university degrees. Sales revenues exceeded R35/\$5 billion in its last fiscal year. The firm is the *de facto* ‘African Wal-Mart’. Two interviews were conducted with senior managers perceived to be involved and responsible for forecasting activities at the firm. The first interview was conducted with a senior level corporate marketing director at the firm’s headquarters. This respondent perceived that “*no forecasting was conducted*” at the firm but stores were stocked and customer demand was addressed through a method of “*just enough*” from 20 distribution centres. Further statements in the same vein resulted in the interview being

terminated after 15 minutes with a request for an introduction to another senior manager perceived to be involved or knowledgeable in forecasting activity. This introduction was granted and a follow-up interview was conducted two days later with the group supply chain general manager. This manager is a 52 year engineer who holds a master's degree in business administration. The interview with this manager lasted over two hours. The latter reported that a formal forecasting department has been in existence at the firm for the last nine years. This department is located within the supply chain function of the firm and employs 25 full-time personnel who spend 80% of their time developing and managing forecasts for over 200,000 product SKUs delivered by over 5,000 suppliers to over 600 Damas operated supermarkets. It is reported that senior management of Damas "that understand forecasting" are highly supportive of the efforts of the department. Not all of the senior management understand the firm's forecasting practices as evidenced by the opinions expressed by the marketing director resulting in a cadre of managers being less than fully supportive of the efforts of the forecasting department. Forecasting accuracy levels at the SKU level, as measured by MAPEs, are reported as 29%, 16% and 25% for 30, 90 and 360 day horizons respectively. At the product category level, the same measure is reported as 17%, 11% and 13% for 30, 90 and 360 day horizons respectively. At the aggregate firm level, the same measure is reported as 15%, 14% and 13% for 30, 90 and 360 day horizons respectively.

Forecasts are continuously generated by the forecasting department for daily, weekly and monthly intervals. Major revisions to existing forecasts are performed every 90 days but *ad hoc* revisions are continuously performed. In the FY07 fiscal year, 21 and 7 inventory turns for grocery and non-food products were reported at the distribution centre level. These turns however, deteriorate to 11 and 2 for grocery and non-food items when computed at the retail store level. It is further reported that conflicts of interest amongst different departments with respect to forecast levels has a deleterious effect on forecast accuracy. The firm practices both S&OP and CPFR and utilises time series forecasting methodologies as implemented in the JDA e3 software application the firm uses as its forecasting software support platform. The time series methodologies are applied only to product volume forecasting. *Ad hoc* survey methodologies are also employed at the product volume level.

The education, backgrounds and salaries of the 25 members of the forecasting department are varied. 15 members hail from operations backgrounds, 8 from finance backgrounds and the remaining two members from mathematics and statistics backgrounds. Two members hold master's degrees, 8 Bachelor's degrees and 15 members have only achieved high school matriculation. The annual base salaries of forecast analysts range from R150 to R200 thousand or \$21 to \$29 thousand, senior analysts from R250 to R400 thousand or \$36 to \$57 thousand and the manager of the department earns R500/\$71 thousand. An incentive bonus, based upon forecast accuracy and service levels, supplements the base salaries of the forecasting staff.

The operating revenue forecasting process adopted by Damas commences with managers from individual branch stores submitting their forecasts to one of 10 regional managers. The regional

forecasts are then split into the various operating divisions within the region and submitted to one of eight area general managers. The area general managers review the forecasts and may or may not make changes prior to submitting the forecasts to the group finance manager and director. The screened forecasts are then sent to the group CEO who performs his own performance review prior to submitting the results to the holding firm's board of directors. This process is shown in Exhibit 5.15:

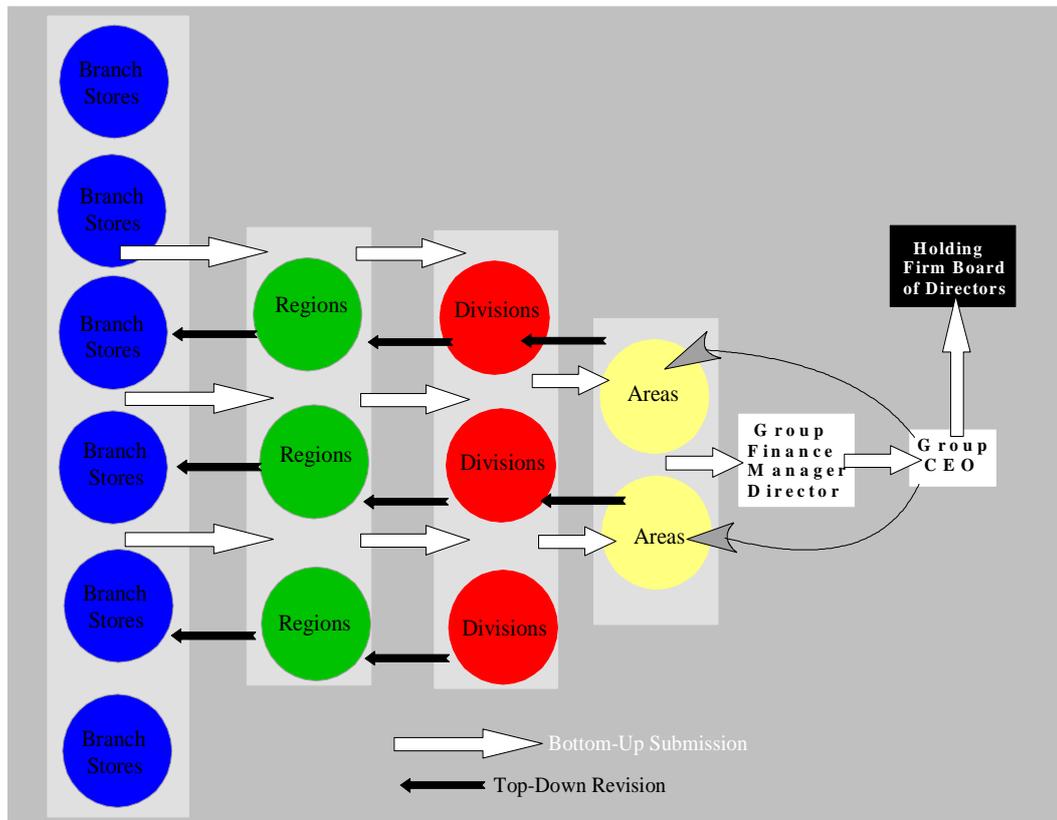


Exhibit 5.15: Damas Ltd - Reported Forecasting Process

The last within-case summary of Section 5.1, that of Damas Ltd, provides supplementary and concomitant details of their forecasting process and other related practices. This summary is shown in Exhibit A.21.

5.2 Cross-Case Summary and Analysis

As previously stated in Sections 1.4 and 5.1 determining patterns, themes, theses and theories as they appear in several interviews (cross-case) is the final stage of the analysis protocol. In essence the goal is to complete the analytical circle by merging cultural categories into analytic categories or in terms of this study to take the particular forecasting experiences and actions of individual RSA firms and merge them into general properties of thought and action (practice) within that

business community. “Upon reaching this goal one is no longer talking about the world as the respondent sees it. One is talking about the world as it appears to the analyst from the special analytic perspective of the social sciences” (McCracken: 46). An added dimension to this analysis goal is to situate these experiences, themes, and patterns with those of Western business communities through the use of the derived benchmarks and metrics-in-use posited in Section 4.3. The path to this goal commences with a piecemeal cross-case summary and analysis of the forecasting practice categories. The first major category is the forecasting process category with its associated benchmarks and criteria. This category is summarised in Exhibit 5.16:

Category : Process						Legend	Symbol
Firm	Exist	Open Ended	Closed loop	Adaptive			
Punters	Blue	Black	Black	Black		Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Lumbers	Blue	Black	Black	Black			
Loaners	Blue	Black	Black	Black			
Networks	Blue	Black	Black	Black		Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Retailers	Blue	Black	Black	Black			
Ebriete	Blue	Black	Black	Black			
Canteens	Blue	Black	Black	Black		Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
Maritime	Blue	Black	Black	Black			
Greige	Blue	Black	Black	Black			
Boisson	Blue	Black	Black	Black		Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	White
Merchant	Blue	Black	Black	Black			
Enivre	Blue	Black	Black	Black			
ATM-WS	Blue	Black	Black	Black			
ATM-LS	Blue	Black	Black	Black			
Nightingale	Blue	Black	Black	Black			
Dinero	Blue	Black	Black	Black			
Libris	Blue	Black	Black	Black			
Lucre	Blue	Black	Black	Black			
Neptune	Blue	Black	Black	Black			
Vache	Blue	Black	Black	Black			
Damas	Blue	Black	Black	Black			

Exhibit 5.16: Forecasting Process Cross-Case Summary

Western *dantotsu* ensure forecasting practices at their firms are conducted through the routine application of a consistent process. Part of the consistency is the nature of the process being ‘closed loop’ and adaptive. The meaning of ‘closed loop’ in this context is that the process consists of continuous circular iterations of generally the same forecasting actions. With each iteration or outcome the firm learns lessons, from good and bad experiences, and adapts or improves its behaviour or forecasting performance in subsequent iterations. The deployment of an iterative, ‘closed loop’, adaptive forecasting process is a best practices benchmark. Observed variations of this practice consist of the CEO or the leader of the firm substituting cultural arrogance for the process by believing he or she knows all there is to know about the outlook of their respective firms and formal processes are unnecessary. This behaviour is typical of start-up, entrepreneurial or high velocity firms (Eisenhardt & Bourgeois, 1988). What is more common in Western practices is the existence of serial, non-adaptive processes. Exhibit 5.16 clearly illustrates the categories of existing and open ended forecasting processes are saturated *vis-à-vis* the RSA respondent pool. Only one firm, Loaners, a commercial bank with an established forecasting department of 30 years appears to have a process in place that allows its managers to profit from its forecasting experiences, both good and bad. Three other firms indicated their processes do promote this adaptive behaviour but

collateral evidence contradicts this posit at Damas and Nightingale. Greige’s posit is not credible. In sum, the RSA respondent pool meets the benchmark of deploying a forecasting process and the criteria of the process being open-ended but fall short of the benchmark process being closed and adaptive.

The second major categories to be examined are the forecasting development criteria and the methods benchmarks. This category is summarised in Exhibit 5.17:

Category: Forecast Development and Methods					
Blue = Benchmark		Black = Criteria or Attribute			
Firm	Top-Down	Bottom-Up	Time Series	Cause & Effect	Judgmental
Punters	Green	Green	Red	Red	Green
Lumbers	Yellow	Green	Red	Red	Green
Loaners	Green	Green	Red	Red	Green
Networks	Green	Green	Red	Red	Green
Retailers	Green	Yellow	Red	Red	Green
Ebriete	Green	Green	Red	Red	Green
Canteens	Green	Green	Red	Red	Green
Maritime	Yellow	Green	Red	Red	Green
Greige	Yellow	Yellow	Red	Red	Green
Boisson	Green	Green	Red	Red	Green
Merchant	Green	Green	Red	Red	Green
Enivre	Green	Green	Red	Red	Green
ATM-WS	Green	Yellow	Red	Red	Green
ATM-LS	Green	Green	Red	Red	Green
Nightingale	Green	Green	Red	Red	Green
Dinero	Green	Green	Red	Red	Green
Libris	Yellow	Green	Red	Red	Green
Lucre	Green	Green	Red	Red	Green
Neptune	Green	Green	Red	Red	Green
Vache	Green	Green	Red	Red	Green
Damas	Green	Green	Green	Red	Yellow

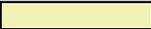
Legend		Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm		Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence
		Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm		Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable

Exhibit 5.17: Forecasting Development and Methods Cross-Case Summary

Western firms routinely deploy bottom-up and/or top-down approaches to developing forecasts. The RSA respondent pool is predominately no different. Greige reports both approaches but in reality the CEO generates and executes her own forecasts. ATM’s top-down forecasts prevail over a token bottom-up exercise and Lumbers, Maritime and Libris choose and use one approach to the exclusion of the other. With these exceptions both categories are saturated and informational redundancy was encountered very early on in the interview cycle. Examination of the broad categories and specific types of forecasting methods reveals a different outcome. Western *dantotsu* resort to using as many different types of forecasting methods and combinations thereof as they are skilled in using, have had success with or have hired knowledgeable consultants to use on their behalf. The three benchmark method types explored during the interview process were time series, cause and effect and judgemental methods. The judgmental category was usage saturated among the RSA respondent firms. Conversely, excluding the financial sector firms, cause and effect

methods were non-usage saturated among the RSA firms. The time series methods category is usage saturated among the high volume variable (SKUs, SKLs, products) RSA firms and financial institutions. The emergent pattern among RSA firms is low volume forecasting (aggregate sales, profits, earnings, small product or service groups) is attempted through non-technical judgmental approaches, high volume forecasting through technical time series methods and exogenous factors (external market, industry and economy) are not formally addressed or forecasted. The exception to this pattern is a commercial bank, an investment bank and a large retailer who diversify their uncertainty by practising all three approaches. The latter meet the *dantotsu* benchmark but the RSA mainstream fall short and a tad behind the Western mainstream. The most recent (2007) IBF metrics-in-use show only 18% of Western mainstream firms deploy methods to forecast turning points in their industry and the economies they operate in. As shown in Exhibit 5.18 this percentage is virtually unchanged from 2006 and down from a high of 24% in 2000:

Method Type	IBF Survey of Methods Usage Measured in Percent							
	2000	2001	2002	2003	2004	2005	2006	2007
Time Series	60.0	61.3	63.1	71.0	67.0	68.0	72.0	61.0
Cause and Effect	24.0	22.7	19.7	19.0	23.0	20.0	17.0	18.0
Judgmental	8.0	13.9	14.0	10.0	9.0	12.0	11.0	15.0
Other	8.0	2.1	3.3	0	1	0	0	6.0

Exhibit 5.18: IBF Metrics-In-Use: Forecasting Method Usage
Source: Institute of Business Forecasting, Jain, 2001-2007.

Attendant to the types of methods used are the categories of forecast horizon, periodicity and revision. Results of the RSA investigation of these categories are summarised in Exhibit 5.19:

Firm	Horizon		Periodicity			Revision	
	One Year	Year +	Weekly	Monthly	Quarterly	Monthly	Quarterly
Punters		10					
Lumbers		3					
Loaners		3					
Networks							
Retailers		3					
Ebriete		5					
Canteens		3					
Maritime		3					
Greige							
Boisson		3					
Merchant		1.5					
Enivre		5					
ATM-WS							
ATM-LS							
Nightingale							
Dinero		3					
Libris		3					
Lucre		3					
Neptune		5					
Vache		2.3					
Damas		5					

Legend

Evidence Supports:

1. Benchmark being Met at Firm or
2. Criteria Existing at Firm or
3. Attribute Existing at Firm

Unremarkable Incident of:

1. Benchmark Non-Existence or Not-Applicable or
2. Criteria Non-Existence or Not-Applicable or
3. Attribute Non-Existence or Not-Applicable

Exhibit 5.19: Forecasting Development Cross-Case Summary

The RSA pool in the main, focus their forecasting efforts within the short term of a minimum of a one year horizon. Firms with long lead-time capitalization requirements such as Punters building theme parks, Ebriete bottling plants, Enivre vineyards and Damas distribution centres respond to their operating environments with a medium term outlook *circa* five years. The periodicity (forecasting ‘bucket’) saturates on the monthly category while revisions, dictated by operating idiosyncrasies are either made monthly or quarterly. There are no broad Western benchmarks for these categories but IBF longitudinal metrics-in-use show the RSA practices are unremarkable and congruent with mainstream Western firms. The IBF metrics are shown in Exhibit 5.20:

<u>Forecasting Horizon</u>	IBF Survey of Horizon, Periodicity and Revision Measured in Percent							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
One Year	34.8	34.4	36.8	41.4	39.0	46.0	44.0	36.0
Over a Year	29.5	29.8	30.2	24.4	29.0	22.0	29.0	35.0
Periodicity								
Weekly	nd	nd	nd	nd	11.0	nd	14.0	17.0
Monthly	nd	nd	nd	nd	41.0	nd	42.0	38.0
Quarterly	nd	nd	nd	nd	15.0	nd	13.0	14.0
Revision								
Monthly	51.9	54.2	60.0	70.4	68.0	nd	73.0	67.0
Quarterly	14.0	18.1	15.9	7.9	7.0	nd	nd	9.0

nd = no data collected

Exhibit 5.20: IBF Metrics-In-Use: Forecasting Horizon, Periodicity and Revision
Source: Institute of Business Forecasting, Jain, 2001-2007.

The third major category is the integration and presentation category with its associated benchmarks and criteria. The first part of this category is summarised in Exhibit 5.21:

Category : Integration and Presentation - Part 1						
Firm	Blue = Benchmark		Black = Criteria or Attribute		Legend	Symbol
	Reconcile	No Conflict	# of Forecasts	Integration		
Punters	Green	Green	2	Red	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Lumbers	Yellow	Red	1	Green		
Loaners	Red	Green	2	Red		
Networks	Yellow	Green	1	Yellow	Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Retailers	Red	Red	2	Red		
Ebriete	Green	Green	1	Yellow		
Canteens	Green	Red	2	Red	Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
Maritime	Green	Red	2	Green		
Greige	Yellow	Red	2	Red		
Boisson	Green	Green	1	Green	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	Yellow
Merchant	Yellow	Green	1	Green		
Enivre	Green	Red	2	Red		
ATM-WS	Yellow	Red	1	Yellow		
ATM-LS	Yellow	Red	1	Yellow		
Nightingale	Green	Red	2	Green		
Dinero	Red	Green	2	Red		
Libris	Green	Red	2	Green		
Lucre	Green	Red	2	Green		
Neptune	Green	Red	2	Green		
Vache	Green	Red	2	Green		
Damas	Red	Red	2	Red		

Exhibit 5.21: Integration and Presentation Part 1 Cross-Case Summary

Western *dantotsu* utilize different forecasting approaches (top-down, bottom-up) and different methods (time series, cause and effect, judgemental) to seek out the most accurate and credible forecasts to achieve optimal operating and financial performance. In so doing they are not naive to the fact that cultural categories of power, politics and conflict also come into to play during the search. Reconciling conflicting forecasting conduct and by-products as well as harmoniously combining (integrating) different conflicted and non-conflicted forecasts into one, is the standard of *dantotsu*. Investigation of these phenomena in the RSA pool revealed that those firms that conduct their business using two different forecasts or sets of forecasts create conflict conditions that negatively affect forecast accuracy. Typical examples of these conflicts are sales wanting a higher production run to make sure enough product is available for their customers while manufacturing does not want to assume the inventory risk and finance does not know which position to support, the increased profit or sales or the decreased costs of manufacturing. Three exceptions emerged from the RSA pool namely Punters, Loaners and Dinero and once simple esoterica were revealed in these cases, these cultural categories saturated and informational redundancies were attained. Punters and Loaners second sets of forecasts are generated by overseas shareholders and the board of directors respectively and revert back to the firm's operations more as suggestions than directives and do not cause conflict. Dinero's second set of forecasts are generated by the founder MD and they prevail over the first set without conflict – benign dictatorship. In sum, 67% of the respondent pool report using two sets of forecasts to run their businesses and of those 79% report these conflicts negatively impact forecast accuracy. These results are higher than those reported for Western mainstream firms. 2007 IBF metrics-in-use report 51% of these firms use multi-number forecasts to run their businesses and 60% of mainstream firms report conflicts among different functions in the firm negatively impact accuracy. The IBF does not separate conflict existence amongst different quantities of multi-forecast users and as such the 60% measure is not comparable to the 79% measure of the RSA respondent pool. The comparable RSA measure is 67%. The longitudinal IBF metrics-in-use are shown in Exhibit 5.22:

<u>Number of Forecasts</u>	IBF Survey of Conflict and Number of Forecasts Measured in Percent							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
One-Number	nd	56.4	55.6	52.0	47.0	56.0	40.0	49.0
Multi-Number	nd	43.6	44.4	48.0	53.0	44.0	60.0	51.0
<u>Conflict affect accuracy</u>								
Yes	69.0	58.5	65.7	63.0	69.0	64.0	63.0	60.0
No	31.0	41.5	34.3	37.0	31.0	36.0	37.0	40.0

nd = no data collected

Exhibit 5.22: IBF Metrics-In-Use: Number of Forecasts and Conflict
Source: Institute of Business Forecasting, Jain, 2001-2007.

What separates mainstream firms and *dantotsu* is the latter's ability to reconcile, integrate and harness conflicting forecasts and non-conflicting forecasts in the direction of the most accurate and productive forecasts. To state the obvious, conflicted multi-number forecasts are not an anathema

amongst *dantotsu* and neither are single non-conflicted forecasts. The *dantotsu* know which combination and under what conditions each should be deployed. Investigation of the RSA pool reveals a more simplistic approach of binary cohorts of single forecast users (SF) and two forecast users (TF). Sorting the pool into these cohorts as shown in Exhibit 5.23 provides a clearer view of the practices of each:

Category : Integration and Presentation - Part 1					Legend	Symbol
Firm	Reconcile	No Conflict	# of Forecasts	Integration		
ATM-LS			1		Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	
ATM-WS			1			
Boisson			1			
Ebriete			1		Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	
Lumbers			1			
Merchant			1			
Networks			1		Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	
Canteens			2			
Damas			2			
Dinero			2		Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	
Enivre			2			
Greige			2			
Libris			2			
Loaners			2			
Lucre			2			
Maritime			2			
Neptune			2			
Nightingale			2			
Punters			2			
Retailers			2			
Vache			2			

Exhibit 5.23: Integration and Presentation Part 1 Sorted Cross-Case Summary

The SFs, in the main, use one forecast that is neither reconciled, challenged, diversified or integrated with other types or functional forecasts. Ebriete’s reconciliation consists of choosing amongst different time series methods and Merchant’s integration consists of the inclusion of promotional outliers identified by the stores to the head office time series forecasters. Lumbers ignore conflict caused by the single forecast used at their firm. Only Boisson meets the benchmarks of true reconciliation and integration in this cohort. The TFs, in the main, experience conflict from their dual approach and attempt to reconcile the conflict. Loaners and Dinero do not report conflict and as such do not feel reconciliation is necessary. Punters uses two forecasts but constitutes one as a ‘suggestion’ that is not conflicted and therefore reconciled but not integrated. This poor practice is quite consistent with the Mentzer and Moon (2006: 319) concept of “*islands of analysis*”. Maritime, Nightingale, Libris, Lucre, Neptune and Vache meet the benchmarks of reconciling different forecasts and integrating them to achieve the corporate goal of generating the most accurate and productive forecasts. In sum, the RSA pool contains a number of firms whose practices meet the at hand benchmarks but a number of others do not. The IBF’s survey based metrics-in-use are unrevealing as to the practices of Western mainstream firms *vis-à-vis* these benchmarks. Their instrument fulfils the role of enumerating distributions of quantity not accessing patterns of quality.

Related to the reconciliation and integration benchmarks are the *dantotsu* practices of conducting forecast consensus meetings attended by various functional departments and subsequent forecast

presentations to senior managers of the firm. *Bona fide* forecasters driving these consensus meeting and presentations is considered another benchmark while members of different functional departments driving the meetings and presentations is not considered a best practice as political bias may compromise true consensus and objective reporting to senior management. The opportunity for senior management to make and recommend changes to the forecast at functional department or *bona fide* forecaster sponsored meetings, in a participative manner, is also considered desirable but not essential. Results of the RSA investigation relating to these benchmarks and criteria are summarised in Exhibit 5.24:

Category: Integration and Presentation - Part 2					
Blue = Benchmark		Black = Criteria or Attribute			
Firm	Consensus Meetings	Forecaster Driven	Function Driven	Presentation	Manag. Changes
Punters	Green	Yellow	Green	Yellow	Yellow
Lumbers	Red	Green	Yellow	Green	Yellow
Loaners	Green	Green	Yellow	Green	Yellow
Networks	Green	Yellow	Green	Yellow	Yellow
Retailers	Green	Yellow	Green	Yellow	Yellow
Ebriete	Green	Green	Yellow	Green	Yellow
Canteens	Green	Yellow	Green	Yellow	Yellow
Maritime	Green	Yellow	Green	Yellow	Yellow
Greige	Green	Yellow	Green	Yellow	Yellow
Boisson	Green	Yellow	Green	Yellow	Yellow
Merchant	Red	Green	Yellow	Green	Yellow
Enivre	Green	Yellow	Green	Yellow	Yellow
ATM-WS	Green	Yellow	Green	Yellow	Yellow
ATM-LS	Green	Yellow	Green	Yellow	Yellow
Nightingale	Green	Yellow	Green	Yellow	Yellow
Dinero	Red	Green	Yellow	Green	Yellow
Libris	Red	Yellow	Green	Yellow	Yellow
Lucre	Green	Yellow	Green	Yellow	Yellow
Neptune	Green	Yellow	Green	Yellow	Yellow
Vache	Green	Yellow	Green	Yellow	Yellow
Damas	Green	Yellow	Green	Yellow	Yellow

<p>Legend</p> <p>Evidence Supports:</p> <ol style="list-style-type: none"> 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm <p>Evidence does not fully Support:</p> <ol style="list-style-type: none"> 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm 	<p>Remarkable Incident of:</p> <ol style="list-style-type: none"> 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence <p>Unremarkable Incident of:</p> <ol style="list-style-type: none"> 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable
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Exhibit 5.24: Integration and Presentation Part 2 Cross-Case Summary

The consensus meeting and presentation benchmark categories saturated midway through the interview process with the respondent pool, in the main, reporting both these benchmark activities occur at their respective firms. Informational redundancy was reached once firm specific idiosyncrasies relating to the relevance and applicability of the meetings and presentation were revealed. Specifically, Lumbers and Merchants operate their forecasting activity within the supply chain and operations functions respectively and are subject to supply constraints and vagary. As such consensus is by and large moot. They supply what they can. Dinero is founder, principal driven and consensus is informally ‘encouraged’. Libris is also subject to informal consensus but in this case the CFO is the ‘consensus maker’. The discovered at hand practices of the RSA respondent pool are quite consistent with the Mentzer *et al.* theory-in-use categorization of Stage 2 of their Func-

tional Integration dimension as shown in Exhibit 2.5. The RSA pool falls short of the benchmark of having a *bona fide* forecaster drive and conduct forecasting consensus meetings and presentations. The majority of meetings and presentations are orchestrated by different functional departments not by an apolitical forecaster. Senior managers at the respondent firms are, in the main, reported to be provided the opportunity to participate in the forecasting process by making changes at the various meetings. Senior managers at some RSA firms, most notably at Lucre leave these decisions to their more qualified and attuned equity analysts and portfolio managers. In sum, the RSA pool meets some of the integration and presentation benchmarks but fall short of others. Relative to the Western mainstream they fall very much into the Stage 2 not the *dantotsu* level or stage 4 of the Mentzer *et al.* theory-in-use Functional Integration dimension.

The fourth major category of benchmarks is the forecast implementation category. *Dantotsu* go to great pains to ensure the forecasts they develop, reconcile and agree upon, are actually used by the firm. *Dantotsu* do not take for granted what should be axiomatic – they track implementation of the forecast, performance to the implemented forecast, variance from the implemented forecast and attend to understanding why the variance occurred. The results of the RSA investigation *vis-à-vis* these benchmarks are summarised in Exhibit 5.25.

Category: Forecast Implementation						
Blue = Benchmark		Black = Criteria or Attribute				
Firm	Track Implementation	Perform to forecast	Track Variance	Reconciliation of Variance	Legend	Symbol
Punters	Green	Green	Green	Green	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Lumbers	Green	Green	Green	Green		
Loaners	Green	Green	Green	Green		
Networks	Green	Green	Green	Green		
Retailers	Green	Green	Green	Green	Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Ebriete	Green	Green	Green	Green		
Canteens	Green	Green	Green	Green		
Maritime	Green	Green	Green	Green		
Greige	Yellow	Yellow	Green	Green	Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
Boisson	Green	Green	Green	Green		
Merchant	Green	Green	Green	Green		
Enivre	Green	Green	Green	Green		
ATM-WS	Green	Green	Green	Green	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	Light Yellow
ATM-LS	Green	Green	Green	Green		
Nightingale	Green	Green	Green	Green		
Dinero	Green	Green	Green	Green		
Libris	Green	Green	Green	Green		
Lucre	Green	Green	Green	Green		
Neptune	Green	Green	Green	Green		
Vache	Green	Green	Green	Green		
Damas	Green	Green	Green	Green		

Exhibit 5.25: Forecast Implementation Cross-Case Summary

The ‘tracking of forecast variances’ benchmark is saturated and informationally redundant. All the respondent firms advised they track forecast variances. Remarkably not all exercise the same due diligence in understanding why and how the variances occurred rather paying more attention to the quantity of the variance. This conduct is more consistent with the practices of a mechanical accounting process rather than a *dantotsu* level of professional forecasting. Of lesser concern is the fact that a minority of the RSA firms confirmed that they do not have procedures in place to make

sure the forecasts they spend a considerable amount of time and effort in developing are actually used by the firm. Punters, Loaners, Networks, Retailers and Dinero all report they neither track implementation of their forecasts nor consistently perform to the forecasts they develop. This lack of discipline appears to transcend business type (industry, sector) and size. Punters is a fairly large gaming and entertainment firm, Loaners is a large commercial bank, Networks is medium sized software services firms, Retailers is a large furniture and appliance retailer and Dinero is a small asset fund manager. Greige is a 50 year old medium sized clothing retailer and manufacturer who report they track and perform to their forecasts but independent analysis and evidence is at odds with their posit. An RSA positive lining of these findings is that the IBF metrics-in-use show an average of 25% of their surveyed mainstream firms over the last 7 years do *not* even track forecast variances. In fact the 2007 survey indicates 28% of Western mainstream firms they surveyed do not track forecast variances (Exhibit 3.2). The IBF's metrics-in-use do not survey the important 'implementation tracking' and 'perform to forecast' benchmarks and the Mentzer *et al.* theories-in-use are silent on both benchmarks. They do however report the occurrence of these poor practices in their 'islands of analysis' theme. It is not uncommon for mainstream Western firms to develop true demand forecasts only for the operational wing of the firm to produce lesser quantities of supply. Conversely, it more common for mainstream Western firms to develop elaborate sales/supply forecasts which *are* produced by the factory only for marketing to find the customer base demanded and would have purchased more. Not achieving or recognizing the *dantotsu* benchmarks discussed results in a perpetuation of this poor practice.

In sum, the RSA respondent pool all track variances of forecasts against the actual results of their firms. For some firms the resultant calculations may be meaningless as the measured forecasts may not be the ones they previously agreed to measure or previously agreed to use. Adding to their confusion the firms, in the main, make no effort to understand why the variances occurred, who to hold accountable for the variances and how to profit from these experiences. Implications of this result will be addressed in holistic detail in the conclusions section of Chapter 6.

The fifth major category of benchmarks is the forecast quality control category and extends the logic of the implementation benchmarks. *Dantotsu* track how the users of the forecast act upon receipt of a forecast from the developers of the forecast. To this end they track the nature and quantity values of the forecasts that are fed 'in' to the manufacturing or execution wings of the firm against what the nature and quantity values that come 'out' of the manufacturing or execution wings of the firm. A simple example is the case of the sales and marketing wing of a software consulting firm providing the field consulting and installation group with a 180 day forecast of 50 customer committed contracts and the latter hires and trains 40 consultants. The next set of benchmarks in this category track the actual results (orders, sales, licenses, loans) the firm experiences against the forecast variable values developed. Variances are computed against the forecast sent 'in' to the users/executers and variances are computed against the values the firm actually produced or came 'out' of execution wings (factory, staffing, trading) of the firm. The last two

benchmarks in this category assess whether the previous measurement benchmarks are ‘fed back’ to the developers of the forecast and if in fact the feedback has any impact on the future practices of both the developers and the users/executors of future forecasts. The results of the RSA investigation *vis-à-vis* these benchmarks are summarised in Exhibit 5.26.

Category: Forecast Quality Control							
Firm	Blue = Benchmark		Black = Criteria or Attribute			Variance Feedback to Development	Feedback Impact
	Track Forecast 'In' Quantity	Track Forecast 'Out' Quantity	Track Actual	Measure Forecast 'In' Variance	Measure Forecast 'Out' Variance		
Punters							
Lumbers							
Loaners							
Networks							
Retailers							
Ebriete							
Canteens							
Maritime							
Greige							
Boisson							
Merchant							
Enivre							
ATM-WS							
ATM-LS							
Nightingale							
Dinero							
Libris							
Lucre							
Neptune							
Vache							
Damas							

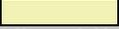
<p>Legend</p> <p> Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm</p> <p> Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm</p>	<p> Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence</p> <p> Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable</p>
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Exhibit 5.26: Forecast Quality Control Cross-Case Summary

Consistent with meeting the implementation benchmark of tracking variances the RSA pool obviously also track actuals. What is not obvious to Loaners, Networks, Retailers, Canteens, Greige, Enivre and Neptune is adhering to the benchmarks of making sure their respective firms execute to the intent and quantities of the forecasts they develop. As a result when these firms compute a variance, as they all do, they do not know what the variance measures or represents. The variances could represent poor demand projection, poor supply execution, political infighting, excellent demand forecasting and poor supply execution, excellent supply execution and poor demand forecasting or outright rejection of any forecasts and numerous combinations of the aforementioned. In contrast Boisson, a large producer and distributor of alcoholic beverages, Lucre a very large financial services firm and Damas, the ‘Wal-Mart of Africa’ (1) track how they use their forecasts, (2) measure how accurate these forecasts are, (3) measure what happens when others do not use the forecasts they develop and most importantly (4) let the forecast developers know if their time is

being wasted and by whom their time is being wasted and (5) provide the forecast developers and the investors in their cause with the intellectual capital and data to profit from and remedy these mistakes. These firms are the *dantotsu* of the pool with respect to these benchmarks. Merchant needs to meet the standards of (4) and (5) above to join this group, Loaners (2) and (3) and Ebriete (3) and (5). Punters, Maritime, Dinero and Libris report the forecasts they develop are willy-nilly the ones they execute in their operations. These firms however, still fall short of the benchmarks of learning from the positive and negative experiences associated with their alleged unitary forecast and applying the learned experiences to the development of future forecasts. In a similar vein Networks, Retailers, Greige and Neptune posit that because they either outsource their supply or cannot control or influence their supply (legal harvesting quotas) discerning between supply generated variances and demand shortfall errors is not a worthwhile exercise. The *dantotsu* disagree. In sum, only a few firms from the investigated pool meet all the forecast quality control benchmarks, some firms meet some of the benchmarks and others have a long way to go. These findings are not inconsistent or remarkable in the context of the practices of mainstream Western firms *vis-à-vis* these benchmarks. IBF's metrics-in-use and the Mentzer *et al.* (1999) performance measurement theories-in-use are explicitly silent on these benchmarks and posit no data to the contrary. Mentzer *et al.* (2006: 238) do however provide some Western context by reporting related survey findings thus: "*Apparently, many companies have a formal and documented sales forecasting process, but this process lacks the fundamental aspect of performance measurement.*"

The sixth major category of benchmarks is the forecasting department category. This category consists of four parts. The first part contains benchmarks and criteria that define standards related to the existence, independence, accuracy track record, perceived credibility and organisational positioning of the forecasting department. The *dantotsu* invest and fund forecasting departments that are preferably independent line, rather than staff functions. These departments boast established forecasting accuracy track records and are perceived as credible within the organisations. Part of their credibility is derived from the respect they earn as honest brokers of risk management intelligence and information delivered without political agendas and motives. The age or longevity of the forecasting department is a criterion to be considered but there are no hard and fast standards. Some forecasting departments in some industries establish themselves very quickly, others take much longer and some fail and disband. The second part of the category focuses on the exact organisation location of the forecasting department if one exists at a firm. In the event one does not exist at a firm the location of where forecasting activities are conducted is investigated. Once the form and location of forecasting activity is determined the qualities of the employees entrusted with the task of driving successful and productive forecasting within the firm is put under the spotlight in the third part of the department category. These qualities include their education, backgrounds, salaries and the benchmark of firms providing salary bonuses and other incentives based upon forecasting accuracy. The fourth and final part of the department category discovers the accuracy levels attained by its forecasters or employees at various levels. These levels are the product SKU level, the product or service category level and the entire firm level.

The results of the RSA investigation relating to the first part of the forecasting department benchmarks are summarised in Exhibit 5.27:

Category : Forecasting Department - Part 1							
Firm	Blue = Benchmark		Black = Criteria or Attribute			Line Function	Staff Function
	Existence of a Department	Age of Department in Years	Independent Unit	Established Accuracy Record	Forecasting Perceived as Credible		
Punters							
Lumbers		4					
Loaners		30					
Networks							
Retailers							
Ebriete		15					
Canteens							
Maritime							
Greige							
Boisson		1					
Merchant		5					
Enivre		20					
ATM-WS							
ATM-LS							
Nightingale							
Dinero							
Libris							
Lucre		30					
Neptune							
Vache		1					
Damas		9					

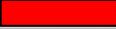
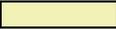
Legend		Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm		Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence
		Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm		Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable

Exhibit 5.27: Forecasting Department – Part 1 Cross-Case Summary

Slightly more than half of the RSA pool fails to meet the benchmark of operating an independent forecasting department. Damas the ‘Wal-Mart of Africa’ meets all the related benchmarks by operating an independent, line functioning forecasting department that has established an accuracy track record and is perceived as credible by the rest of the firm. Boisson comes close to the ‘full house’ but their department operates within the Marketing function of the firm not as a separate department. In mitigation however this location is the second best location for the forecasting function in demand driven environments. Boisson’s reported practices are remarkable in view of meeting four out of the five benchmarks in only one year. The forecasting department at Damas has been in existence for nine years. The ages of the forecasting department in the non-financial services sectors range from a start-up of 1 year to 20 years with an average of 7.8 years. As shown in Schedule 3.2 the IBF report in their latest survey the average age of mainstream Western forecasting functions was 7.3 years in 2007 up from 5.1 years in 2006. Loaners and Lucre operate their long established (30 years) economic forecasting departments as independent staff (not line) functions within strategic planning departments. Adjusting for their operating environment they too

achieve the ‘full house’ of the benchmarks at hand. The high volume SKU forecasting departments of Ebriete, Merchant, Enivre, Vache and Lumbers meet most, but not all of the benchmarks. Vache needs to establish credibility, Ebriete an accuracy record and Merchant, Lumbers and Enivre credibility and accuracy records. The rest of the pool needs to consider establishing a forecasting department as a starting point. Further findings on the organisational locations of the various forecasting departments or forecasting activities are shown in Exhibit 5.28 which is sorted by those firms who do have departments (green background) and those that do not (red background):

Category : Forecasting Department Location								
Firm	Blue = Benchmark			Black = Criteria or Attribute				
	Finance	Forecasting	Logistics	Marketing	Operations/Prod	Sales	Strategic Planning	Supply-Chain
Lumbers								
Loaners								
Ebriete								
Boisson								
Merchant								
Enivre								
Lucre								
Vache								
Damas								
Punters								
Networks								
Retailers								
Canteens								
Maritime								
Greige								
ATM-WS								
ATM-LS								
Nightingale								
Dinero								
Libris								
Neptune								

Legend	<div style="background-color: green; width: 20px; height: 10px; margin-bottom: 5px;"></div> <p>Evidence Supports:</p> <ol style="list-style-type: none"> 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm 	<div style="background-color: red; width: 20px; height: 10px; margin-bottom: 5px;"></div> <p>Remarkable Incident of:</p> <ol style="list-style-type: none"> 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence
	<div style="background-color: yellow; width: 20px; height: 10px; margin-bottom: 5px;"></div> <p>Evidence does not fully Support:</p> <ol style="list-style-type: none"> 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm 	<div style="background-color: white; width: 20px; height: 10px; margin-bottom: 5px;"></div> <p>Unremarkable Incident of:</p> <ol style="list-style-type: none"> 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable

Exhibit 5.28: Forecasting Department Location Cross-Case Summary

RSA respondents who operate forecasting departments locate them in every functional area of the firm but the financial area. The firms that do not operate forecasting departments locate forecasting activity predominantly in the finance area among others at the same time. The *dantotsu* locate their forecasting departments as either independents on their own, within strategic planning departments, within the President/CEO offices and within sales and marketing departments in market driven firms. Supply chain locations for supply challenged firms have been popular but are not an established standard. Loaners, Boisson, Lucre and Vache meet the location benchmarks. Lumbers, Ebriete, Merchant, Enivre and Damas are supply challenged firms and locate their forecasting function in either logistics, operations or in the composite supply chain. With respect to the respondents who do not operate forecasting departments, Mentzer *et al.* (1999) provide a Western

context by situating them in their Stages 1 and 2 of their Functional Integration dimension theory-in-use as shown in Exhibit 2.5. Stages 1 and 2 are far removed from *dantotsu* benchmarks. The IBF metrics-in-use provide a Western mainstream firm longitudinal context for the organisational location of forecasting activity. The results of their annual surveys are summarised in Exhibit 5.29:

Department	IBF Survey of Organizational Location of Forecasting Activities in %							
	2000	2001	2002	2003	2004	2005	2006	2007
Finance	12	14	10	9	6	5	7	7
Forecasting	7	10	9	11	12	8	12	19
Strategic Planning	5	6	5	4	3	12	4	6
Forecasting and SP	11	16	15	14	15	20	16	25
Logistics	10	9	14	10	12	12	11	7
Operations/Production	19	20	20	25	25	26	26	27
Supply Chain	29	29	35	34	37	38	37	34
Marketing	19	20	20	21	15	13	14	12
Sales	17	12	13	15	15	17	15	10
Sales and Marketing	36	32	32	36	30	30	29	22
Other	11	9	8	7	12	8	11	12

Exhibit 5.29: IBF Metrics-In-Use: Location of Forecasting Function
Source: Institute of Business Forecasting, Jain, 2001-2007.

Patterns emerging from these data are firstly, more and more independent forecasting departments are being established by mainstream Western firms. Secondly, locating forecasting functions in the finance areas are becoming less frequent, although in 2007 the rate increased by 2% from the low of 5% in 2005. Thirdly, forecasting activity appears to have migrated from the demand chain (sales and marketing) into the supply chain (logistics, operations and production). Specifically, in 2000 the IBF's respondents (forecasters and those wishing to become forecasters) indicated that 29% and 36% of forecasting activity at their firms was located in the supply and demand chains respectively, while in 2007 the percentages were 34% and 22% respectively. However, prior to any incontrovertible inferences being drawn the IBF needs to properly qualify the remarkably high 'Other' category measured at 12% in 2007. Critical to the functioning and the success of corporate forecasting activities are the qualities of the employees hired to conduct these activities and manage constituted forecasting departments, where they exist. Quantities of employees hired are also a factor but are of lesser importance. As previously stated, employee qualities to be considered are their business related functional backgrounds, their academic qualifications, their salaries, the forecast accuracy levels they have attained in their jobs and whether or not they are motivated by salary bonuses or other types of incentives to improve upon the accuracy levels they have attained. The discovery of these analytical categories are bifurcated into two cohorts namely, the cohort that generate forecasts within a formally constituted forecasting department, hereafter referred to as the '*de jures*', and the cohort that generate forecasts as part of other functions in other constituted departments, hereafter referred to as the '*de factos*'. The bifurcated results of the RSA investigation of these categories are summarised in Exhibit 5.30:

Category: Forecasting Employee Backgrounds								
Firm	Number of :		Background					
	Forecasters	Employees Engaged in Forecasting	Fin/Accounting	Marketing	Sales	Statistics/Maths	Operations	Economics
Lumbers	2	2						
Loaners	5	5						
Ebriete	3	11						
Boisson	3	3						
Merchant	2	35						
Enivre	6	6						
Lucre	2	12						
Vache	1	1						
Damas	25	25	8			2	15	
Punters		2						
Networks		20						
Retailers		25						
Canteens		15						
Maritime		4						
Greige		3						
ATM-WS		1						
ATM-LS		1						
Nightingale		50						
Dinero		1						
Libris		12						
Neptune		13						

<p>Legend</p> <p> Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm</p> <p> Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm</p>	<p> Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence</p> <p> Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable</p>
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Exhibit 5.30: Forecasting Employees and Backgrounds Cross-Case Summary

The *de jure* cohort report a total of 49 forecasters being employed ranging from 1 to 25 with an average of 5.4 employees. As shown in Exhibit 3.2 the IBF reports mainstream Western forecasting functions employed an average of 4.9 employees in 2007 up from an average of approximately 4 employees in 2006. The non-accounting background category of the *de jure* cohort saturated midway through the interview process and became informationally redundant once a single firm Damas, advised a small minority of their large forecasting staff had some accounting background. Conversely, the accounting category among the *de facto* cohort also saturated very early in the investigation and became informationally redundant when Canteens and ATM revealed a small minority of employees involved in the roles at hand had accounting backgrounds. In the main however, the backgrounds of the ‘*de jures*’ trifurcate into the demand chain (sales and marketing), the supply chain (operations, manufacturing and logistics) and the quantitative chain (mathematics, statistics and econometrics) and not surprisingly they land up working at firms that adopt their background chain. On the other hand the ‘*de factos*’ bifurcate into the dominant finance/accounting category and the rare *ad hoc* category. The Mentzer *et al.* (1999) theory-in-use does not address employee functional background qualities but the IBF’s metrics-in-use do provide a quantitative longitudinal measure of the backgrounds of their respondents (conference attendees currently employed as forecasters or those wishing to become forecasters). These data are shown in shown in Exhibit 5.31:

Function	IBF Survey of Functional Backgrounds of Conference Attendees in %							
	2000	2001	2002	2003	2004	2005	2006	2007
Finance/Accounting	28	15	13	13	12	14	16	13
Marketing	17	19	20	19	16	23	24	26
Sales	12	12	13	11	10	13	12	9
Demand Chain	29	31	32	29	26	36	36	35
Supply Chain	11	17	20	26	31	33	31	32
Statistics/Maths	17	16	15	13	6	7	8	10
Other	14	21	21	19	25	10	9	10

Exhibit 5.31: IBF Metrics-In-Use: Functional Backgrounds of IBF Conference Attendees
Source: Institute of Business Forecasting, Jain, 2001-2007.

The IBF metrics-in-use indicate their conference attendees have, over the years, hailed less from the finance and accounting arenas and more from the demand and supply chains with the latter becoming more frequent. The reported decline of current and potential ‘forecasters’ hailing less from the pure quantitative arenas may signal an alarm for the developers and teachers of quantitative methods of forecasting. The next quality to be considered is the level of formal academic education the forecaster has received. *Dantotsu* forecasters predominantly hold a minimum of a master’s degree. Results of the RSA ‘*de jures*’ and ‘*de factos*’ investigation are shown in Exhibit 5.32:

Category: Education					Legend	Symbol
Firm	High School	Bachelor's	Master's	Doctorate		
Lumbers					Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	[Green Box]
Loaners						
Ebriete						
Boisson					Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	[Yellow Box]
Merchant						
Enivre						
Lucre					Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	[Red Box]
Vache						
Damas	15	8	2			
Punters					Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	[White Box]
Networks						
Retailers						
Canteens						
Maritime						
Greige						
ATM-WS						
ATM-LS						
Nightingale						
Dinero						
Libris						
Neptune			10 CAs			

Exhibit 5.32: Forecasting Employees Education Cross-Case Summary

Excluding the *de jure* economic forecasters, who hold master’s degrees, the bachelor’s category saturates for both the ‘*de jures*’ and the ‘*de factos*’. The high volume forecasters, Lumbers, Merchant, Enivre and particularly Damas, provide titles such as forecaster or planner to their matrices/high school graduates but their tasks do not exceed the role of ‘pigeon carriers’. Hard observed evidence of this conduct was provided at Damas where the ‘analysts’ take the physical hardcopy generated by the senior analysts and managers to a wing of a building with corridors of

meeting rooms. In these rooms they sit down with representatives from numerous suppliers and determine or negotiate with the suppliers the forecasted quantities. The analysts do not develop or change the forecasts. They merely attempt to administer the forecasts. This conduct at Damas, the ‘Wal-Mart of Africa’ is not too different from that observed in Bentonville, Arkansas, the home of the Wal-Mart of America. The only difference is the wing of the building is an entire building, the number of ‘pigeon carriers’ is closer to 100 hundred and their titles are either merchandisers or procurers. The hard evidence is that this level of employee does not develop forecasts rather they administer them.

Another outlier unearthed during the investigation is the tendency of some of the ‘*de factos*’ especially Neptune, to consider their chartered accountant certifications to be equivalent to a master’s degree in the arena of business forecasting. Close investigation of this posit revealed minor analytical forecasting activity is conducted by the CAs and most of their time is applied to general ledger activity, budget administration and financial statement preparation. In general, only a minority of each cohort meet the benchmark of a minimum of a master’s degree. The forecasters of all the financial services firms meet the standard with master’s degrees but none have doctorates.

The Mentzer *et al.* (1999) theory-in-use does not address the analytic category of educational quality. The IBF’s survey based metrics-in-use provide Western mainstream data that is not inconsistent with the findings of the RSA ‘*de jures*’ with the exception of a small minority of doctorate level forecasters being present. The IBF report the doctorate preponderance is higher in Western pharmaceutical sectors (Jain 2007: 37). These longitudinal surveys are summarised in Exhibit 5.33:

<u>Education Level</u>	IBF Survey of Education Levels of Conference Attendees in %							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
High School	nd	nd	nd	8	3	5	6	8
Bachelor’s	nd	nd	nd	50	49	50	52	52
Master’s	nd	nd	nd	33	45	43	41	41
Doctorate	nd	nd	nd	9	3	2	1	4

nd = no data collected

Exhibit 5.33: IBF Metrics-In-Use: Education Levels of IBF Conference Attendees
Source: Institute of Business Forecasting, Jain, 2001-2007.

The salaries and bonuses firms pay to employees performing forecasting activities may arguably be considered a quantitative measure of qualitative cultural categories of attitude, disposition and value as previously discussed in Section 4.1. In this specific instance, the value firms place in the practice of forecasting and by default the value the practitioners may place in themselves, can be quite revealing. Salary levels and bonus information provided by the RSA respondent pool during the interview process are summarised in Exhibit 5.34:

Category: Salaries and Bonuses											
Firm	Accuracy	Analyst		Senior Analyst		Manager		Director		Total	
	Incentive	R,000	\$,000	R,000	\$,000	R,000	\$,000	R,000	\$,000	R,000	\$,000
Lumbers		280	40	420	60	650	93			1,350	193
Loaners		400	57	600	86	800	114			1,800	257
Ebriete		450	64			600	86			1,050	150
Boisson		360	51	600	86	720	103			1,680	240
Merchant		250	36	350	50	500	71			1,100	157
Enivre				350	50	500	71	800	114	1,650	236
Lucre				720	103					720	103
Vache						450	64			450	64
Damas		175	25	325	46	500	71			1,000	143
<i>De Jures</i>	Mean	319	46	481	69	590	84	800	114	1,200	171
Punters						450	64	1,750	250	2,200	314
Networks						700	100	1,000	143	1,700	243
Retailers						450	64	650	93	1,100	157
Canteens		84	12	280	40					364	52
Maritime						700	100	1,000	143	1,700	243
Greige		120	17	240	34	360	51			720	103
ATM-WS				400	57	750	107			1,150	164
ATM-LS				400	57	750	107			1,150	164
Nightingale		130	19	300	43	600	86			1,030	147
Dinero		na	na	na	na	na	na	na	na	na	na
Libris		200	29	250	36	500	71			950	136
Neptune		200	29	350	50	500	71	750	107	1,800	257
<i>De Factos</i>	Mean	147	21	317	45	576	82	1,030	147	1,260	180

Exhibit 5.34: Forecasting Employees Salary and Bonus Cross-Case Summary

The pool of firms deploying *de facto* forecasters fails to meet the benchmark of providing incentives based upon forecast accuracy. Ebriete, Merchant, Lucre and Damas from the ‘*de jures*’ meet the benchmark of providing incentives based upon forecast accuracy. Ebriete use MAPEs, Merchant WMAPESs and Damas service levels as their respective accuracy measures in computing the bonuses of their forecasters. Forecast analyst salaries amongst the ‘*de jures*’ range from R175/\$25 thousand to R450/\$64 thousand with a cohort average of R319/\$46 thousand at R7 to one US dollar exchange rate. Similarly, senior analyst salaries range from a low of R325/\$46 thousand to a skewed senior equity analyst high of R720/\$103 thousand with an average of R481/\$69 thousand. *De jure* manager salaries range from R450/\$71 thousand to R720/\$103 thousand with an average of R590/\$84 thousand. Total unit salary/payroll costs of the ‘*de jures*’ ranges from a low of R450/\$64 thousand to R1.8 million or \$257 thousand with a cohort average of R1.2 million or \$171 thousand. With respect to the ‘*de factos*’ the majority of forecasting activity takes place at the manager and director level. Salaries of the managers range from R360/\$51 thousand to R750/\$107 thousand with an average of R576/\$82 thousand. Directors, who are typically finance directors/CFOs in the ‘*de factos*’ cohort register average salaries of R1.03 million or \$147 thousand. This average however contains two extreme outliers of the Punters CFO earning R1.75 million or \$250 thousand and the Retailers FD earning R650/\$93 thousand. Total unit salary/payroll costs of the ‘*de factos*’ ranges from a low of R364/\$52 thousand to R2.2 million or \$314 thousand with a cohort average of R1.26 million of \$180 thousand.

Emergent from the near parity total salary/payroll costs of the two cohorts is a divergent disposition/attitude or value judgement from the responding RSA firms. One cohort of firms view forecasting activities of the firm worthy of the full-time attention of a specialised group of employees in a formally constituted department or location within the firm and is willing to invest in labour costs to an average unit level of R1.2m or \$171 thousand a year. The other cohort of firms view

forecasting activities of the firm worthy of the part-time and *ad hoc* attention of its senior managers and directors located in various different departments within the firm and posits the salaries it pays these employees, primarily for *other* tasks, is adequate to cover forecasting costs. The Mentzer *et al.* (1999) forecasting dimensions theory-in-use provides a Western context with respect to the accuracy based incentives and salary bonuses benchmark. As shown in Exhibit 2.5, Mentzer *et al.* posit Stage 2 firms as those who provide “*performance rewards for forecasting personnel only, based on contribution to department in which forecasting is housed.*” Stage 3 firms are those who provide “*performance rewards for improved forecasting accuracy for all personnel involved in consensus process*” and Stage 4 firms are those who provide “*multidimensional performance rewards for all personnel involved in consensus process.*”

The IBF intermittently surveys its conference attendees for the presence of accuracy based incentives at their firms and reports an average of 69% of the attendees at conferences in 2000 through 2004 and 2006 report that accuracy based incentives do not exist at their firms. The IBF did not survey or report this item for 2007. Individual annual survey results are shown in Exhibit 3.2. It did however, survey and report salary levels for the 2000 to 2007 period. These data are shown in Exhibit 5.35:

<u>Level</u>	IBF Survey of Forecaster Salary Levels measured in \$,000										
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>00-03</u>	<u>04-07</u>	<u>% Δ</u>
Analyst	45	47	49	50	49	50	52	54	48	51	7
Senior Analyst	54	62	63	62	64	66	68	68	60	67	11
Manager	55	71	75	77	77	79	78	79	70	78	13
Director	94	105	105	103	111	111	109	111	102	111	9
Vice President	129	143	143	144	163	161	156	158	140	160	14

Exhibit 5.35: IBF Metrics-In-Use: Salary Levels of IBF Conference Forecaster Attendees
Source: Institute of Business Forecasting, Jain, 2001-20007.

From these surveys it can be seen that the average salaries of forecast analysts for the four year period of 2000 to 2003 was \$48,000 and rose by 7% in the subsequent four years to \$51,000. Similarly senior analyst, manager and director average salaries rose by 11%, 13% and 9% respectively during the same periods. The largest gain in average salaries for the two periods was for vice presidents of forecasting rising by \$20,000 to an average level of \$160,000 slightly over the 2007 reading of \$158,000. Exchange rate adjusted salaries for the RSA ‘*de jures*’ show their average analyst salaries to be \$46,000 compared to the IBF 2007 analyst pool of \$54,000, the senior analysts \$69,000 compared to the IBF senior analysts of \$68,000, the managers \$84,000 compared to the IBF managers of \$79,000 and the Director of \$114,000 compared to the IBF directors of \$111,000. The RSA respondents do not report ‘Vice Presidents of Forecasting’ positions at any of their firms.

The *prima facie* evidence suggest that the salaries of the RSA forecasters studied are paid highly competitive if not better salaries than their mainstream Western peers except at the low level ana-

lyst position. Caution however should be exercised in making these types of inferences as these types of comparisons need to be conducted at the comparable sector/industry level as salaries paid in different industries vary greatly. It is for this reason and others generic salary level benchmarks are not presented in this study.

As stated previously, the fourth and final part of the department category discovers the quality, or lack thereof, of the accuracy levels attained by its forecasters or employees engaged in forecasting of different business variable levels. The accuracy levels discovered are for the product SKU variables, the product or service category variables level and the entire firm variables. As with previous department related categories the discovery was conducted for two different units of analysis namely the ‘*de jure*’ cohort and the ‘*de facto*’ cohort. The results of the discovery is summarised in Exhibit 5.36:

Firm	Category: Forecast Accuracy Measured in Percent								
	SKU			Category			Firm		
	Month	Quarter	Year	Month	Quarter	Year	Month	Quarter	Year
Lumbers	45	45	30	40	40	20	30	25	20
Loaners					10	10		10	10
Ebriete	46		80	17	25	55	8	10	10
Boisson	10	5	5	10	5	5	10	5	5
Merchant	40			40			2		
Enivre	33						3		20
Lucre					13	17			
Vache	23						5	8	15
Damas	29	16	25	17	11	13	15	14	13
Punters							4	3	3
Networks					15			5	5
Retailers				5	5		5	5	10
Canteens				10	10	7	10	10	15
Maritime					20				
Greige									
ATM-WS				20	10	10			
ATM-LS				6	19	65			
Nightingale				10	7	5	8	5	4
Dinero								15	27
Libris				17	13	20	17	13	20
Neptune				15	20	30	7	7	15
De Jures	32	22	35	25	17	20	10	12	13
De Factos				12	13	23	9	8	12

Exhibit 5.36: Forecasting Accuracy Cross-Case Summary

The ‘*de jures*’ report average variances of 32%, 22% and 35% at the SKU level over the 30, 90 and 360 day horizons. These variances are averages for very large numbers of SKU volume forecasts. Most of the variances are calculations of MAPEs but some firms use WMAPEs. At the product category level the average variances are less than those experienced for individual SKUs. The product category average variances are 25%, 17% and 20% for the 30, 90 and 360 day horizons respectively. Some of the ‘*de jures*’ generate firm monetary level forecasts by applying average selling prices to their individual volume level forecasts and consolidate the results into monetary forecasts while others forecast firm level monetary forecasts directly. The average variances reported for both approaches are 10%, 12% and 13% for the 30, 90 and 360 day horizons respec-

tively. The *'de factos'* only forecast monetary measures by product or service categories and at the firm level. They report average monetary category variances of 12%, 13% and 23% and 9%, 8% and 12% at the firm level for 30, 90 and 360 days respectively. Reported variances highlighted with yellow backgrounds in Exhibit 5.36 indicate evidence was found during the investigation that does not fully support the accuracy of the variances reported.

A *prima facie* comparison of the results of the monetary firm level average variances would suggest the accuracy of the forecast generated by the *'de factos'* is equal to or better than those of the *'de jures'*. This inference would be spurious as the *'de factos'* do not use the same MAPE and WAPE measures as the *'de jures'* as it was discovered many of them engage in a common budgeting related practice of measuring forecast variances by using forecast values in the denominator of the equation rather than the numerator. Mentzer *et al.* (1999: 55) classifies this as a Stage 2 practice. They state: “*In Stage 2, companies begin to measure forecast accuracy, generally using the Mean Absolute Percent Error, or MAPE. However, because of their still limited understanding of the process, they incorrectly specify the MAPE formula, using forecast rather than demand in the denominator and incorrectly inflating the accuracy measure. The higher the forecast, the lower the MAPE value, regardless of whether the forecast was accurate or not.*”

In short, the variances of the two cohorts shown in Exhibit 5.36 should be viewed independent of each other. The IBF metrics-in-use surveys provide data on accuracy levels reported by its respondents. These data are shown in Exhibit 5.37:

<u>Department</u>	IBF Survey of Forecast Accuracy as Measured by MAPEs							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
SKU - one month	25	28	20	26	26	28	27	29
SKU - one quarter	33	29	27	29	30	34	32	33
SKU - one year	21	33	28	30	29	39	32	38
Category - one month	18	19	13	17	18	18	20	16
Category - one quarter	20	18	16	15	19	22	22	22
Category - one year	16	21	19	16	21	23	29	27
Company - one month	12	11	11	15	13	13	17	11
Company - one quarter	15	11	16	16	17	17	20	20
Company - one year	15	11	15	16	16	14	20	21

Exhibit 5.37: IBF Metrics-In-Use: Forecast Accuracy Measurements
Source: Institute of Business Forecasting, Jain, 2001-2007.

Notwithstanding potentially different industry/sector weightings in the calculations of MAPEs of the RSA *'de jures'* and the IBF respondent cohort, the two sets of results are fairly comparable. With the aforementioned caveat in mind, the SKU accuracy of the *'de jures'* was considerably lower (11 percentage points) than the 2007 IBF cohort accuracy over the one quarter horizon and three points higher over the one month and one year horizons. At the category level the results are the same. At the firm level the *'de jures'* outperform the IBF cohort in all three horizons. The *'de*

juries lag slightly behind the 2007 IBF cohort over the 30 day horizon when it comes to SKU and product or service category forecasting accuracy.

The seventh and final major category of benchmarks and practice criteria to be discovered is the organisational support category. The *dantotsu* practice their forecasting profession with the highly substantive support of the senior management structure at their firms. This substantive support, in the main, takes the form of the provision of and investment in dedicated and in many cases highly tailored and specialised *bona fide* forecasting software. In many cases, but not all, separate operating budgets and separate forecasting systems are also provided. *Ad hoc* use of both internal and external consultants both in the systems area and forecasting methodologies is also funded. The latter is frequently in the form of hiring econometricians to develop econometric models to assess the impact of external economic conditions on the firm's operations. The results of the investigation into this category of benchmarks and practice criteria, are summarised in Exhibit 5.38:

Firm	Category: Organisational Support								
	Upper Management			Separate		Software		Consultants	
	Highly	Somewhat	No Need	Budget	Systems	Spreadsheet	Forecasting	Internal	External
Lumbers									
Loaners									
Ebriete									
Boisson									
Merchant									
Enivre									
Lucre									
Vache									
Damas									
Punters									
Networks									
Retailers									
Canteens									
Maritime									
Greige									
ATM-WS									
ATM-LS									
Nightingale									
Dinero									
Libris									
Neptune									

Exhibit 5.38: Organisational Support Cross-Case Summary

The highly supportive upper management category saturated after the fourth RSA pool interview and became informationally redundant after Libris indicated the nature of the high level of support at that firm was more rhetorical than substantive. Other saturated categories were the *'de jures'* being provided with separate operating budgets to conduct their forecasting tasks and the *'de factos'*, without exception, using off the shelf spreadsheet software to compile their forecasts. In contrast the *'de jures'* use specialised and often specifically tailored forecasting software to develop their forecasts and utilise, if needed, the report generating capabilities of the spreadsheets for that and only that purpose. Loaners, Ebriete, Merchant, Lucre, Vache and Damas meet the forecasting software benchmark. Lumbers, Boisson and Enivre surprisingly do not. Both cohorts call upon internal and external consultants on *ad hoc* bases to support their forecasting activities with the *'de jures'* using these types of services frequently. The Mentzer *et al.* (1999) forecasting dimensions

theory-in-use situates Stage 3 firms in their approach dimension as those firms who have “*strong management support for forecasting process*” and Stage 4 firms as those who have “*top management support for forecasting process*”. The nature of the support is not itemized or qualified. The IBF’s metrics-in-use provide limited Western context data on some category items. These data are summarised in Exhibit 5.39:

IBF Survey of Organisational Support Categories measured in %								
Support of Upper Management	2000	2001	2002	2003	2004	2005	2006	2007
Highly	44	46	48	42	44	43	57	54
Somewhat	52	49	49	54	53	51	42	45
No Need	4	5	3	3	2	6	1	1
Forecasting Software								
Spreadsheet	58	46	48	64	49	46	44	42
Forecasting	42	54	52	36	51	54	56	58

Exhibit 5.39: IBF Metrics-In-Use: Management Support and Software
Source: Institute of Business Forecasting, Jain, 2001-2007.

The IBF surveys suggest the upper management of Western mainstream firms are less supportive of forecasting activities than the near universal support reported for the RSA pool of firms. In 2007 just over half of the Western mainstream firms indicate high levels of support, albeit the level of support has grown over the years. With respect to the use of *bona fide* forecasting software as a benchmark, 42% of the Western mainstream still has to meet this standard albeit movement towards the standard has improved from the 36% level in 2003. The RSA 2007 ‘*de factos*’ fall well below the benchmark and the levels of the 2007 Western mainstream.

5.3 Research Quality Control

Having concluded the fourth step of research strategy, the discovery of the analytic categories, two questions need to be addressed prior to the delivery of the conclusions based upon the investigation discovery and grounded findings. These questions are how does the investigator ensure the quality of his or her own qualitative research and how does the user of this research treat it with confidence? These are the questions of standards of research quality control. The ‘*Long Interview*’ research strategy aligns itself with the standards applied by qualitative researchers in the study of the humanities, namely the application of ‘*symptoms of truth*’. These symptoms are exactness, economy, mutual consistency, external consistency, unity, power and fertility (McCracken: 50). In a similar fashion, case study expert Yin (2003: 33) posits that trustworthiness, credibility, confirmability and data dependability are the criteria of assaying ‘research designs’ and offers four related quality tests. These tests are construct validity, internal validity, external validity and reliability. In addition Yin (2003: 97) proffers three principles of data collection namely, the usage of multiple sources of evidence, the creation of a case study database and the maintenance of a chain of evidence. Miles and Huberman (1994: 277) offer “*some practical standards that help us all judge the*

quality of conclusions” of qualitative research. Their five standards are “*objectivity/confirmability, reliability/dependability/auditability, internal validity/credibility/authenticity, external validity/transferability/fittingness and utilization/application/action orientation.*” Consumer researcher, Spiggle (1994), departs from the norm and offers some provocative criteria for evaluating qualitative research. These criteria are usefulness, innovation, integration, resonance and adequacy.

Mindful of the fact that the focus of this study is primarily one of forecasting practices and standards not qualitative research practices and standards, only the major, non-redundant standards will be addressed in this section.

With respect to Yin’s data collection principles, this study adhered to all three of his principles. Multiple sources of data were discovered and investigated. Data and information obtained from respondent interviews were triangulated against company documents provided by the firms, independent financial documents filed with regulatory agencies, annual and quarterly reports filed with regulatory agencies and independently published media and trade journal reports on each firm investigated. A case study database was constructed of all the evidence gathered and synopses and within-case and cross case summaries are shown as exhibits in this study. Naturally flowing from the creation of this database a chain of custody of the evidence has been maintained.

With respect to which standards of quality should be applied to the present research strategy, its findings and the conclusions, the standards offered by Miles and Huberman (1994) have been chosen as they provide a comprehensive frame encompassing those offered by Yin and McCracken. The Miles and Huberman (1994) standards will be addressed piecemeal as follows:

- 1) Objectivity/Confirmability. This standard can be framed as one of assessing if the study was free of the biases of the investigator or as a minimum explicitly declared to assist other external researchers attempting to replicate the study and results. The present study provides step by step details of the research strategy adopted. In particular Section 4.1 provides other researchers with the familiarization and defamiliarization frame the study used to address the potential pitfall of investigator bias and/or reflexivity. In particular the replicating scholar who, in the event is also an economist or not a trained ethnographer or industrial psychologist, may follow the same note taking protocol adopted in this study.
- 2) Reliability/dependability/auditability. The issue here is “*whether the process of the study is consistent, reasonably stable over time and across researchers and methods.*” The present study provides other researchers with the used interview plan containing the suite of forecasting benchmarks and associated criteria and attributes grounded in the review of the analytic categories or the extant literature review. The present study provides other researchers with the suite of planned prompts used in the interview plan and process. These prompts were grounded in the review of the cultural categories. The definitions of cate-

gorical saturation and informational redundancy are grounded in the extant literature and are available to other researchers. The standards, adopted by Mentzer *et al.* (1999) and Moon *et al.* (2003) on point with the present application of the qualitative method of inquiry to the study of business forecasting practices, were met and exceeded by the present study and are available to other researchers. Consequently, full disclosure has been made for other researchers to replicate *the present* study and audit its results, subject to the consent of the anonymous respondent firms.

- 3) Internal validity/credibility/authenticity. This standard is subject to various definitions, interpretations and areas of focus amongst qualitative researchers. Some researchers apply the standard to the evidence discovered, some to the findings grounded in the evidence and others to both. Common to the definitions and focus are tests to determine how accurate, truthful and believable are the accounts of the respondents' constructions of reality of the social phenomena under study and by default the resultant grounded findings. Simply put in the context of this study, one has to test if the forecasting respondents' accounts of forecasting practices at their firms are consistent with the *reality* of the practices at the firm. Do they make sense, are the respondents being truthful and can one place capital in the forecasting practice findings as a result of these representations? The answer to these questions is a case of due diligence. Specifically, all evidence provided by the respondents were subject to triangulation, audited for accuracy and subjected to 'sanity checking'. A critical example of this was the due diligence, truth testing of the forecasting accuracy results data provided by each respondent. These data were checked for consistency against balance sheet and income statement items. If for example a respondent proffered his product forecasts were within 90% of actual sales and scrutiny of the balance sheet and income statement revealed stock/inventory turns were in the two to three range and inventory write-offs were declared, the respondent was challenged to reconcile the two. The present study declared and highlighted like incidences in each case synopsis. Upon reconciliation the resultant findings were validated/cross checked against peer firms and against the results of Western counterpart studies. Secondly, each aspect of the reported practice was evaluated not just as a series of discrete practices but also as a practice as a whole. The nature of forecasting practice is that one pitfall leads to another and if incredible, inconsistent, untruthful and unrealistic renditions of a particular aspect of the practice is reported it portends another will follow. When this compounding pattern did not occur in the interviews, the item was immediately audited and the respondent was challenged to reconcile the inconsistency. Thirdly, a routine due diligence tactic to meet the standard in question was deployed. This tactic was prolonged engagement with the respondents. After the interview process, respondents were communicated with both telephonically and electronically over a period of nine months as part of the fact checking and sanity checking due diligence exercise. The goal of this prolonged collaboration was to ensure the evidence and the renditions thereof were accurate, made sense, were believable and provided

a sound grounding for inferences and conclusions. Fourthly, the issue of the instrument of inquiry is relevant to meeting this standard. The present study investigator, prior to the interviews in question, had conducted over 125 like interviews and client studies as a compensated professional forecasting consultant over a period of 20 years. Notwithstanding the reflexivity requirement of the present study research protocol, the truth and value seeking goals of the paid client interviews required no less due diligence than the level applied to evidence discovery in the present study. It should be noted no distinction in the level of due diligence was made with respect to data discovery and consequent findings. Findings were the result of triangulated methods of analysis, specifically ethnographic, case study and grounded theory methods or research strategies. Further checks and balances in the form of constant comparison against comparable theories-in-use, metrics-in-use and other RSA and Western studies were also deployed to ensure findings reached were contrasted, challenged, reconciled and 'sanity checked' against extant analytic and cultural categories. *Ipsa facto* the present study requirement of contextualization of findings forces the construction and deconstruction of complementary and rival findings, a standard test for internal validity.

- 4) External validity/transferability/fittingness. This standard is arguably the most important of the standards to be considered. Miles and Huberman (1994: 279) define the standards thus: "*We need to know whether the conclusions of the study have any larger import. Are they transferable to other context? Do they 'fit'? How far can they be 'generalized'* "? In considering these questions, it should be clearly observed that Miles and Huberman (1994) punctuate the word *generalized* with quotes. This is intentional as the word is somewhat of an anathema in the qualitative genre. If and when it is used in qualitative studies it refers to theoretic or analytic generalizations not the oft used statistical generalizations of the quantitative genre. The present study is of the qualitative genre and its position on generalization has been made abundantly clear in Section 4.5. The present study is focussed primarily on mining and understanding the analytic and cultural categories not the probability or frequency of occurrence of these categories. Specifically, the principal focus of the study has been to discover and understand how RSA firms conduct their business forecasting activities, why they engage in certain practices, what are the patterns in these practices and what is the quality of these practices in the context of Western standards. Endowed with this discovery and understanding, a set of standards that are transferable or will fit another firm, challenged by the task of forecasting elements of its business and its operating environment, is to be offered to the science. As such the transferability of the findings and conclusions of the present study, as in the case of numerous other qualitative studies, takes precedence over generalisability (Alaggia & Kirshenbaum, 2005). Kidder and Judd (1986) succinctly articulate this approach thus: "*A field researcher rarely asks, 'What percentage of persons in the population would respond this way'? Instead he/she says: 'What I have found true of the people in this study is likely to*

be true of any people placed in this situation.” To achieve this level of external validity, transferability and ‘fittingness’ numerous tactics and safeguards were deployed during the stepwise progression of the present study. Firstly, the respondent pool was chosen to capture the four corners of diversity to enhance broader external applicability. Small, medium and large firms participated in the study. Manufacturing, service, retailing, wholesaling, transportation, financial services, medical services and food and beverage firms participated in the study. In fact the only notable private sectors of the RSA economy that did not participate were the supply constrained mining and energy sectors. Secondly, the characteristics of the respondent pool are clearly identified with respect to their personal profiles, contextual settings, compliance or lack thereof with practice benchmarks and associated forecasting criteria and attributes. This full disclosure facilitates ease of transferability. It should be noted that the intent of transferability is to empower the *reader or user* of research findings and conclusion with the ability to perform their own generalisations by allowing them, *not* the researcher, to make the determination of whether a study’s findings and conclusions are transferable and applicable to their setting. Princeton educational psychologist Robert Stake termed this process “*naturalistic generalization*” (Gomm *et al.*, 2000:22). The very thick descriptions of the forecasting practices of *dantotsu* provided in Section 4.3 allow any RSA or Western firm to make a determination if these standards are applicable to their setting and how they fare in relation to the standards. Further, the very thick description and declaration of an offered forecasting process in the same section provides any RSA or Western firm with the opportunity to begin operationalising the process and measuring the results of the process. Indeed the very generic nature of the standards and the offered process provide firms outside the manufacturing and sales forecasting arenas the opportunity to test their results and replicate the process in their environments. In sum, to meet the research standards of quality pertaining to external validity/transferability/fittingness, the present study has engaged in the tactical use of diversity, full disclosure, thick descriptions, replicatability and genericism. These tactics allow any firm the opportunity to transfer the study offerings or to naturalistically generalise.

- 5) Utilization/application/action orientation. These standards are often referred to as ‘evaluative or pragmatic validity’. What is being tested is the value or utility the study provides the reader and/or user of the research. Does it help or harm them? The response of the present study to these standards is virtually the same as the response for the transferability standards. Specifically, all has been disclosed to the potential user for them to perform an evaluative transfer or naturalistic generalisation to their setting. This includes empowering them to make their own determination. None of the benchmarks, practice criteria and attributes have been concealed from potential adopters. The procedures for reaching findings and ultimate conclusions are grounded in the evidence and analysis. The analysis is relatively straight forward and understandable in that findings and conclusions are predi-

cated on the concepts of categorical saturation, informational redundancy and the most importantly, the preponderance of evidence. Any firm should be capable of analysing its existing forecasting processes to determine if variances encountered in forecasting previous business activity influence subsequent forecasting behaviour. In essence they should be able to determine if they learn or adapt from historical mistakes. There is tangible benefit in this prescribed exercise and no harm. Any firm should be capable of reaching a finding, by repeating the same test quarter after quarter, that not learning or adapting from previous mistakes is a lost opportunity. This finding will thus be predicated on saturation of the process tests. There is only benefit to be gained by replicating these process tests to saturate or confirm its findings – no risk. Any firm should be capable of repeatedly conducting other prescribed and related tests that are part of the process (technical, subjective or managerial) and recording the positive and negative outcomes. The results of these tests will, at some stage, become informationally redundant which will be the predicate for a finding. Once all the saturation predicated findings have been gathered, conclusions based upon the preponderance of evidence (including the findings) may be reached and should precipitate some decision action. There is only practical, tangible benefit to be reached by following this protocol – no risk. In sum, the findings of the present study are predicated on the attainment of categorical (benchmarks, forecasting criteria and attributes) saturation and informational redundancy where complete saturation is not obtained. The study conclusions in turn are predicated upon the findings, the preponderance of evidence and/or the prevalence of discovered patterns. The study evidence, categories, analysis protocol, predicates, findings and conclusions are fully disclosed to the reader and/or potential users of the offered research with the good faith intent of providing tangible utility and scientific contribution.

5.4 Chapter Summary

This chapter discovered the analytic categories, presented synopses of face to face interviews with 30 respondents from 20 anonymous South African firms. Within-case summaries were introduced and are shown in Appendix A. Cross-case summaries and analysis findings of 8 categories of benchmarks, associated forecasting criteria and attributes were presented. Western contexts in the form of relevant theories-in-use and metrics-in-use were also introduced. The chapter concluded with a thorough review of the qualitative research strategy and methods adopted in the study. This review was in essence a form of self conducted research quality control and consisted of assessing the quality of the research conducted against a suite of standards advocated by various qualitative research scholars and practitioners. This assessment also provided and demonstrated the analytical predicates that underpin the study findings and conclusions reached and presented in the next chapter.

*Pope Julius II: "When will you make an end of it?"
Buonarroti : "When I am finished."*

6.1 Introduction

The final chapter of this study is presented in six sections. This section serves as the chapter introduction. The study summary, study findings and implications for the practice of business forecasting are presented in sections 2 through 4 respectively. Limitations of the study and recommendations for future research are presented in the fifth section. The study conclusions are discussed in the final section of this chapter.

6.2 Study Summary

This study was undertaken with the premise that skilled and productive forecasting management practices provide organisations engaged in domestic and global commerce with a competitive or comparative advantage that is both tactical and strategic. The competitive or comparative nature stems from the fact that all organisations engaged in global commerce face the same level of adverse systematic uncertainty or unpredictability (e.g., wars, natural disasters and socio-economic system shocks/collapses) but not the same level of unsystematic adverse uncertainty or unpredictability. Commerce historically has been unable to proactively manage the systematic adversity type, it merely reacts to it. In contrast, the unsystematic adversity type can, to a lesser or greater degree, be proactively managed. The possibility of greater degrees of proactive management of the unsystematic adversity type is an additional premise of the study.

With these background premises an empirical investigation of the business forecasting practices of a community of South African (RSA) firms in the context of 'Western' standards or benchmarks of like practices was undertaken. The aims of the study were :

- (a) to assess the RSA practice standing in the context of the standards or benchmarks of 'Western' firms.
- (b) to guide and assist both RSA and 'Western' firms in the recognition, understanding and implementation of quality and performance driven forecasting practices and processes.

In so aiming, the development and provision of practice and research end products factored into the design of the study. The end products for RSA and 'Western' practitioners and researchers

would be a business forecasting practice ‘roadmap’ and an integrated forecasting process. The study contributed ‘roadmap’ would provide the opportunity to determine the positioning of a firm on the practice map, the positioning of their local and ‘Western’ peers and potential competitors, the shortfalls between each and the distances the firm would have to travel to close these potential shortfalls. The accompanying process would contribute an operating mechanism or vehicle to navigate a firm through the ‘roadmap’ landmarks/benchmarks and *measure* the success or failure of the firm in closing the performance gaps, if and where they existed. The transfer of the ‘roadmap’ and process to other RSA and ‘Western firms’ is called ‘naturalistic generalisation’.

To achieve these aims and contributions the study adopted a multi-method qualitative research strategy to review, compile, analyse and report related evidence in the field of business forecasting practices and processes. The review and evidence gathering stages of the study utilised the ethnographic and case study methods of McCracken (1998) and Yin (2003) while the compilation, analysis and reporting stages followed the grounded study methods of Glaser and Strauss (1967), Strauss and Corbin (1990) and Miles and Huberman (1994).

Chapter 2 reviewed and deconstructed extant published and unpublished literature relating to offerings of ‘Western’ *qualitative* forecasting ‘benchmarks’ and processes. Five major benchmark relevant offerings, namely those of Armstrong (1982, 2001), Fildes and Hastings (1994), Mentzer *et al.* (1996) and Moon *et al.* (2003), were harvested during the review process. Chapter 3 focussed on the review and deconstruction of ‘Western’ *quantitative* forecasting ‘benchmarks’ and related RSA offerings. The major on point quantitative ‘benchmark’ offerings of Jain (2001-2007) and published RSA offering of Yeomans and Bendixen (1988) were harvested during this stage of the review process. Numerous other offerings (Sparkes and McHugh, 1984) were reviewed but were not on point with practice benchmarking. Chapter 4 complied with the ethnographic method requirements of (1) the author’s topic familiarization and defamiliarization, (2) the construction of an interview plan and procedures and (3) the determination of the number and types of respondents that should be interviewed during the study. Chapter 5 presented interview synopses and within-case summaries of the 30 forecasting practice and process interviews conducted at 20 RSA firms over a period of nine months. Evidence gathering quality control measures employed during that period were also summarised. The present and final chapter documents, *inter alia*, the principal findings based on the research and field work documented in Chapters 2 through 5.

6.3 Discussion of Study Findings

The study findings consist of a principal finding related to the quality of extant, offered ‘Western benchmarks’ and seven significant findings related to the business forecasting practices of the 20 RSA firms investigated. The finding related to the quality of extant, offered ‘Western benchmarks’ may be summarised as follows:

The extant literature on ‘Western’ business forecasting best practice standards or ‘benchmarks’ provides the researcher or practitioner with a limited portfolio of options none of which are universally acknowledged or established as a gold standard.

The public domain is home to a limited number of published forecasting benchmark studies and those were discussed in detail in Chapters 2 and 3. Some expressly claim to be practice benchmarks (Mentzer *et al.*, 1999; Moon *et al.*, 2003; Jain 2006) while others (Fildes & Hastings, 1994; Armstrong, 2001) do not and only provide guides and principles consistent with good practices. Utilizing the benchmark ‘stress tests’ of Camp (1989) to the public domain studies claiming to offer forecasting benchmarks, the study found in Section 4.2 that these offerings do not pass some or all of the ‘stress test’ standards. The public domain works thus fall into the categories of ‘public theories in use’, ‘public metrics in use’, parochial consultants platforms (PCPs), published memoirs and do’s and don’ts.

The latter phenomenon makes other qualitative comparative and evaluative studies either very easy or very difficult. The very easy approaches are: (a) to follow, *carte blanche*, the Mentzer *et al.* (1999) and Moon *et al.* (2003) ‘audit benchmarks’ *ala* Green (2001) and Green and Weaver (2005), (b) to measure an organisation’s response to the Fildes and Hastings (1994) ‘aspects’ *ala* Watson (1996) and Hughes (2001) or (c) to ‘go online’ and take the Armstrong (2001) forecasting ‘principles’ test. These approaches, despite not measuring up to most of the Camp (1989) ‘stress tests’, are accepted into the body of literature in the case of approaches (a) and (b) and acceptable practice in the case of approach (c).

The different and difficult approach is for the researcher/practitioner to veer off the trodden path, innovate and offer one’s own approach. The present study followed the latter path by ‘cherry picking’ the more common ‘benchmarks’ from the credible offerings in the public domain and combined the literature benchmarks with the author’s field experience ‘benchmarks’. The difficult task in this approach is the credibility determination of the ‘benchmarks’ and this was accomplished through deconstruction as shown in Sections 2.3, 2.4 and 3.2. The resultant composite/amalgamated ‘benchmarks’ were then used to assess the standing of the 20 RSA firms investigated.

It should be noted that this finding may be classified as a ‘deconstruction’ or revisionist finding in that it differed from the findings or absence of a similar finding from Green (2001), Green and Weaver (2005), Watson (1996) and Hughes (2001). None of the aforementioned studies ‘stress tested’ the ‘benchmarks’ used in their respective studies. This omission may be explained in the case of Watson (1996) and Hughes (2001) in that the research methods and protocol used in their studies did not explicitly mandate deconstruction. In the case of Green (2001) and Green and Weaver (2005) the ethnographic protocol of McCracken (1998) was used yet deconstruction of the various ‘benchmark’ offerings was not undertaken.

As stated previously, seven additional findings relate to the application of the study derived ‘Western benchmarks’ against the practices of the 20 RSA firms investigated. Each of these findings are introduced with a summary statement of the finding and subsequent discussion as follows:

1) The corporate forecasting practice in South Africa is highly factionalised and tribalised.

How firms constitute their forecasting practices is primarily determined by how they judge the value, utility, importance and priority of predicting future levels of their business activity and how they decide to use that information in their decision making processes. If firms judge the practice to be a valuable, high priority, vital component of their planning and decision making process, they formally empower and dedicate trained professionals to the practice and/or formally constitute official forecasting departments. This is evidenced by the structures depicted in Exhibit 5.28 which were mined during the interview process. These empowered professionals or formally constituted departments are the *de jure* forecasting function of the firm, hereafter referred to as the ‘*de jures*’ faction. Moreover, the ‘*de jures*’ faction splits into three focus tribes. One tribe focuses their practice to service the supply planning and associated decision making processes of the firm and a second tribe is focussed on servicing the demand planning and associated decision making processes. A hybrid tribe displaying both supply and demand attributes occasionally is created in financial services firms.

Should a firm however, adjudicate the practice to be less valuable or less of a priority or just ‘helpful’ to their planning and decision making processes they allocate the function to existing employees or existing departments within the firm. This is equally evidenced in Exhibit 5.28 by the location of the forecasting function. In addition, the evidence documented in the within-case summaries (Appendix A) show the titles and job functions of the respondents and the finding above was carefully mined from responses to questions of how much time was spent on *bona fide* forecasting. These existing employees or departments become the *de facto* forecasting function of the firm and are hereafter referred to as the ‘*de factos*’ faction. The two factions thereafter go about the practice in very distinct and different ways and adopt very different standards.

Compared to the findings of previous RSA studies, the present finding is consistent with some aspects of the latter but ‘breaks new ground’ in other areas. Previous RSA studies are limited in scope and quantity. Yeomanns and Bendixen (1988) is in part based upon the unpublished dissertations of their MBA students Kaye (1985), Wilson (1987) and Nunberg (1990) who conducted a similar study to Kaye (1985). None of the aforementioned studies unearthed factionalisation and tribalisation of the forecasting function. They did however find that the most frequent and prevalent forecaster persona was the ‘finance manager/department’. This finding is quite consistent with the nature, form and function of the ‘*de facto*’ faction identified in the present finding and indeed Exhibit 5.28 shows the same frequency finding. Unfortunately all four previous RSA studies were *a priori* restricted by the depth and scope of the ‘one off’ mail questionnaire that served as their

instrument of inquiry. The present finding was mined through a prolonged ethnographic engagement of 14 months.

Winklhofer and Diamantopoulos (1996) conducted 13 in depth interviews of senior managers at 11 UK exporting firms and found similar *'de jure'* and *'de facto'* practice traits among the forecasters from the sales and marketing departments assigned to perform *domestic* forecasts as opposed to the staff assigned to compile *export* forecasts. They noticed different behaviours between the two geographical groups but did not link these findings to the *a priori* or antecedent cultural value judgement of the firm's leaders as their interviews were not ethnographic in design.

2) The *'de jure'* faction meets or partially meets most of the study derived 'Western benchmarks'. The opposite is found of the *'de facto'* faction.

The practices of both RSA factions were assessed against 8 categories of 33 study derived 'Western benchmarks' (Exhibit 4.5). In the main, the *'de jures'* meet or are close to meeting all the practice benchmarks relating to *organisational constitution and functioning*. The cross-case summaries of Chapter 5 evidence they utilise a forecasting process (Exhibit 5.16), they adopt some scientific methodologies (Exhibit 5.17), they conduct the appropriate meetings and presentations (Exhibit 5.24), they track forecast variances (Exhibit 5.24) and they operate from formally recognised and constituted forecasting departments (Exhibit 5.27). This finding is consistent with many of the elements the Mentzer *et al.* (1996) stages 3 and 4 of their functional integration dimension (Exhibit 2.5) finding from interviews of 20 Fortune 500 USA firms. Nunberg (1990) did not uncover practice factionalisation in his survey of 62 RSA firms but did report a very general finding that RSA firms at that time had a "*low-level and inadequate commitment to the forecasting function and procedures were informal and non-procedural*". The present finding applied to the *'de jure'* faction revises the Nunberg (1990) finding.

The *'de jures'* do however, fall short of the Exhibit 4.5, D category of 'benchmarks' namely, those of forecast *implementation and execution*. Exhibits 5.26 and 5.27 evidence the *'de jures'* do not track execution of their forecasts throughout the organisation and have yet to universally establish consistent forecast accuracy records and broad based credibility in their practices respectively. Related to these shortfalls Exhibit 5.16 evidences that all the processes utilised by the *'de jures'* are open-ended and only one is adaptive. This practice does not allow for systematic continuous improvement which is essential for improving accuracy, performance, accountability and credibility. Jain (2003: 27, 2006: 31) advocates improving execution through motivation in the form of forecast accuracy based incentive plans. These types of plans are not universally adopted by the *'de jures'* and consequently these forecasters, who are well compensated to and above the levels of 'Western' mainstream forecasters (Exhibit 5.34 and 5.35), have no compelling force to improve upon the status quo. The aforementioned *implementation and execution* shortfall finding is consistent with elements of the Mentzer *et al.* (1996) stages 1 and 2 of their functional integration dimen-

sion finding among USA firms. Regrettably, this finding also indicates that RSA firms have not improved in this important practice since Nunberg (1990) who found: “*Insufficient action is taken to reduce forecasting errors and no post-mortem procedures and/or corrective feedback is in place to correct potential future errors*”.

All in all, the relevant Chapter 5 cross-case summaries evidence the ‘*de jures*’ meet or partially meet 67% or 22 of the 33 study derived ‘Western benchmarks’. A summary and adherence enumeration of this finding is shown in Exhibit 6.1.

Assessment of the ‘*de factos*’, finds a much lower level of adherence across the spectrum of Exhibit 4.5 benchmarks and in particular those relating to the important *organisational constitution and functioning* and *implementation and execution* categories. With respect to the former category, careful questioning of task time allocation and usage during the interview process revealed the ‘*de factos*’ conduct forecasting activities as a secondary or tertiary, adjunct or appurtenance task to their primary professions or employment tasks. Exhibit 5.27 evidences the universal absence of a forecasting department within the ‘*de facto*’ firms. Consequently, their forecasting output is a by-product or is subsumed by the output of other departments or other processes, primarily the finance department (Exhibit 5.28). This finding is quite consistent with Kaye (1985) and Nunberg (1990) who (as previously stated) found that the finance department and/or manager were most frequently charged with the preparation and responsibility for all departmental forecasting. The present finding and those of Kaye (1985) and Nunberg (1990) are in turn quite consistent with the low ranking (stage 2) functional integration dimension finding of Mentzer *et al.* (1996). In contrast the ‘*de jures*’ are ranked in the 3rd and 4th stages in same category.

With respect to *implementation and execution* categories, the ‘*de factos*’ are found wanting to a greater degree than the ‘*de jures*’ in the same category. Their processes are also all open-ended and non-adaptive (Exhibit 5.16). The level of forecast quality control is far less than those of the ‘*de jures*’ in that their processes do not track execution of their forecasts (Exhibit 5.26). Consequently, not a single ‘*de facto*’ firm was found to provide formal feedback to the developers of their forecast and past forecasting errors were not reconciled (Exhibit 5.25) and did not have any impact on subsequent forecast development (Exhibit 5.26) – past mistakes were repeated. As stated above Nunberg (1990) found the same malady among RSA firms nearly 18 years ago and the lesson still appears not to have been learned. However, this malady is not restricted to RSA firms as Moon *et al.* (2003) found that 75% of their 16 USA audit firms also exhibited limited forecasting performance measurement and lack of performance evaluation. Winklhofer and Diamantopoulos (1996) found the 13 UK industrial exporters they interviewed could not provide precise forecast accuracy statistics albeit they reported they made frequent revisions to their export forecasts. In sum, the present RSA ‘*de facto*’ finding and the Moon *et al.* (2003) audit finding is consistent with the Mentzer *et al.* (1996) stage 2 performance measurement finding while the Winklhofer and Diamantopoulos (1996) exporters are found to be at the 1st stage.

With respect to the *forecast development* category, the *'de factos'* are found to universally embrace rudimentary subjective or judgmental techniques to the exclusion of the more objective and scientific time-series and cause and effect approaches (Exhibit 5.17). Consequently no progress has been found amongst the *'de factos'* since Kaye (1985) and Nunberg (1990). The latter found that despite senior managers reporting formal academic training in quantitative methods they continued to use simple qualitative methods on the job. The Nunberg (1990) finding was clearly at odds with Yeomanns and Bendixen (1988) who believed the 'educative process' was key to improving forecasting skill and knowledge. In contrast, Exhibits 5.17 and 5.38 reveal the *'de jures'* embrace time-series methodologies and to a lesser extent cause and effect methods in their day to day usage of their costly server based forecasting systems such as Oracle RDF and SAP APO. Winklhofer and Diamantopoulos (1996) found a similar dichotomy between forecasters addressing export demand compared to forecasters addressing domestic demand. The former utilised the same subjective approaches as the *'de factos'* while the latter displayed many of the characteristics and practices of the *'de jures'*.

All in all, the relevant Chapter 5 cross-case summaries evidence the *'de factos'* meet or partially meet 33% or 9 of the 27 relevant study derived 'Western benchmarks'. (Six 'benchmarks' related to the *forecasting department* category are not relevant as the *'de factos'* are not constituted into *bona fide* forecasting departments). This finding of one third adherence is contrasted by the two thirds adherence finding of the *'de jures'*. A summary and adherence enumeration of both findings is shown in Exhibit 6.1 below and continued on page 141.

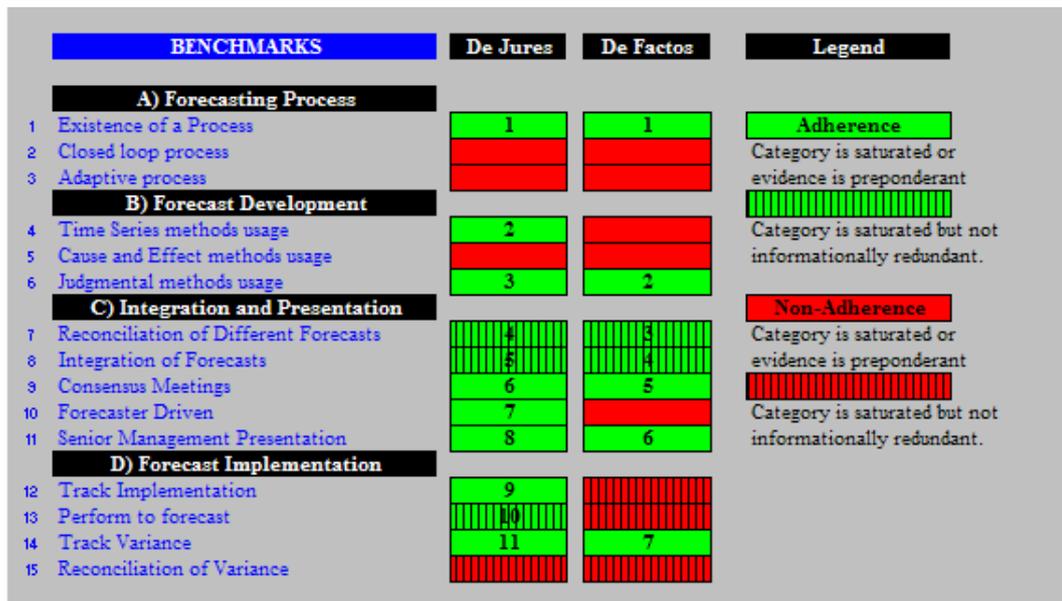


Exhibit 6.1: 'De Jures' and 'De Factos' Benchmark Summary

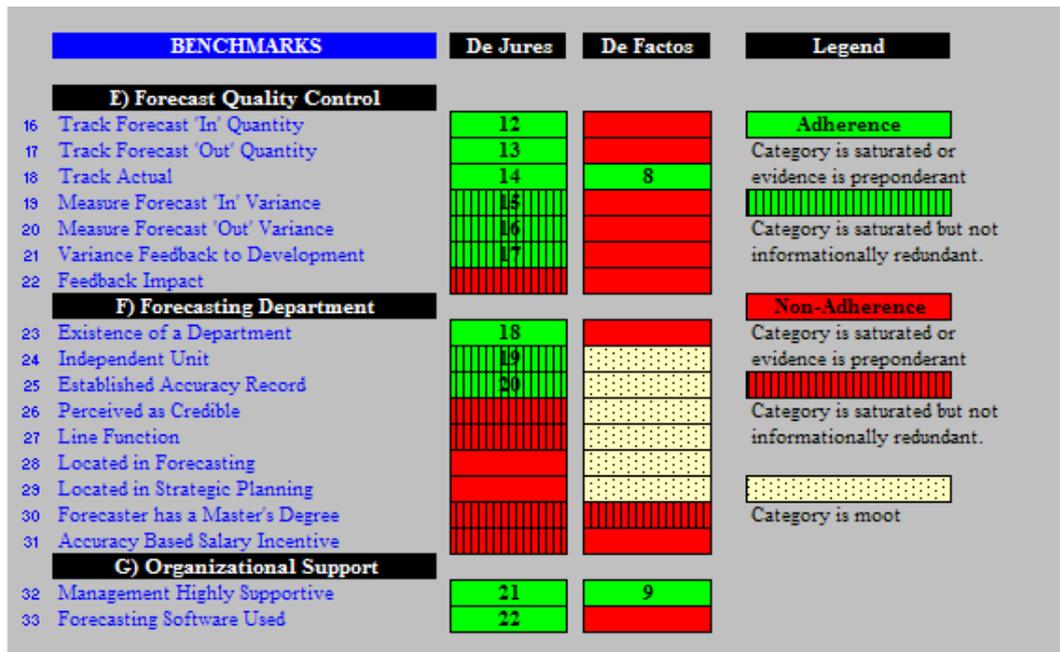


Exhibit 6.1: (Continued) 'De Jures' and 'De Factos' Benchmark Summary

- 3) **The practice is narrowly focussed on internal data and operations while external influencing factors are informally, remotely or independently considered.**

With the exception of the financial services 'de jures', the practices of both factions are found to be primarily focussed at the micro operational levels of the firm. Forecasting methods, processes and practices are predominantly applied to endogenous company data and records. Only 15% (three 'de jures') of the respondent pool are found to use cause and effect methods in their analytical armoury (Exhibit 5.17). Exogenous data and information such as leading economic indicators or industry and market patterns are either anecdotically judged by senior management or subjectively analysed in a vacuum or compartmentalised in non-forecasting functions within the firm. External consultants are found to be most frequently the source of the external intelligence. The within-case analysis on page 87 of one of the more sophisticated firms in the respondent pool, Ebriete typifies these findings. On the whole, no evidence was found from close examination of the within-case process schematics and rich narratives in Chapter 5 of either faction formally and/or scientifically integrating external market, industry and economic conditions and analysis into their internal, micro focussed operational forecasting practices.

Some of above findings are consistent with those of Jain (2007) and Wilson (1987) while some extend their findings. Jain (2007) found only 18% of mainstream 'Western' firms surveyed at their conferences use cause and effect methods to measure external influences on internal operations of their firms. This finding is down from Jain's 2000 finding of

24% (Exhibit 5.18). Wilson (1987) also found only 24% of the 50 RSA firms he mail surveyed used econometric methods. Neither Jain (2007) nor Wilson (1987) investigated or reported on the integration of external data and analysis into a firm's internal formal forecasting process. Wilson (1987) did however find that '*companies with more structure and formalised planning processes were heavy users of econometric forecasts*'. The heavy use finding was silent on the method and quality of use. Quantity of usage and occurrence were the focus of Jain (2007) and Wilson (1987). In contrast, Makridakis *et al.* (1993) found the Cummins Engine Company forecasting process (Exhibit 2.12) formally and systematically integrated external market and industry data and analysis to assess external impacts on internal operations. As reported above this desirable practice of explicitly and formally addressing '*environmental uncertainty*' (Fildes & Hastings, 1994) was not found to be present among either RSA faction.

4) The practice is predominantly defensively deployed not offensively positioned.

As articulated in finding (1), the genesis of a firm's forecasting practices can be traced to the value, utility, importance and priority adjudication of its leaders. The results of the adjudication influence practice constitution, focus and orientation. The '*de jures*' are found to be constituted as a task specific function allied to a larger function and the '*de factos*' are found to be constituted as an adjunct function embedded in a larger function (Exhibit 5.28). The nature of the larger function determines or influences practice orientation.

The majority of the '*de jures*' (Lumbers, Ebriete, Merchant, Enivre and Damas) are found practising within the 'Supply Chain' (manufacturing, production, operations and logistics). They are orientated towards defending the firm against the vagary of its customers and suppliers, the aggression of its competitors and the volatility of the marketplace and economy. Their *modus operandi* is by and large, reactionary. They defensively react to the conduct of their customers, suppliers and competitors and the forces of the marketplace and economy. To predict future consumption of their products and services they use, *inter alia*, exponential smoothing, trend and decomposition methods under the assumption that historical trends, seasonality and infrequent outliers will repeat themselves (Exhibits A2, A6, A11, A12, A21). Unfortunately, the historical trend, seasonality and outlier data they use in their extrapolations are found to be measures of company *supply*, not customer *demand*. Even the most sophisticated and highly capitalised firms (Ebriete, Merchant and Damas) in information technology that were investigated did not have procedures in place to capture accurate histories of customer demand. Their elaborate scanner based point of sale (POS) technology could tell you the time of day a store stocked out of product but could not tell you how many customers and what quantity of products were requested *after* the stock-out and prior to shelf replenishment. In essence the practice attempts to forecast future demand using historical supply information. The output

from these practices is somewhat distorted but manifestly reactive and predictive not proactive and prescriptive. Defending the *status quo* is the order of the day. This defensive orientation finding confirms and extends the thematic '*forecast demand, plan supply*' finding of Moon *et al.* (1998). The latter found from their surveys and interviews of over 200 USA and Canadian firms the recurring symptom of 'accurate' supply forecasting contentment in the context of missed demand opportunities. Moon *et al.* (1998) found that the remedy to this would improve 'capital planning and customer service'. The present finding extends this reasoning beyond internal operations planning to that of offensive market and strategic orientation and planning.

The RSA '*de factos*' are found to practice predominantly out of the offices of the firm's group or centralised staff accounting or finance function (Exhibit 5.28). Less frequently, '*de factos*' are also found to practice out of the offices of a staff accountant seconded to the business or operating units of the firm. In either case the orientation of embedded forecasts emanating from these offices are found to be defensive in nature. These forecasts are grounded in either the budgets or operating plans. They are designed to shield company assets, especially working capital, not exploit market and economic opportunities. Close examination of the detailed within-case summaries in Appendix A evidences 100% of this cohort use only spreadsheet software for all tasks including forecasting. These spreadsheet forecasting 'methods' consist of applying percentage increases or decreases formulae to a previous period's (month, quarter or year) actuals (sales, orders, profits) and simulating or performing 'what if' analysis on different magnitudes of increase or decrease across all line items of the operating plan or budget. The exercise ceases when the finance director believes the plan or budget "*feels right*" or meets the goal of the board or the 'ambitions' of the shareholders. This behaviour was observed time and time again with the *same* behaviour being described in *different* company lexicon or jargon. At Punters the "*feels right*" expression was used, at ATM (see page 97) the term "*ambitions*" featured prominently but finally the term most often heard was "*gut feel*" where intuition is substituted for *bona fide* forecasting. All in all, the output from the above practices is found to be manifestly reactive and extrapolative not proactive and prescriptive. Defending the *status quo* is very much the order of the day.

Other than confirming the prevalence of the finance/accounting department as a surrogate forecasting function and the grounding of forecasts in budgets and operations plans (Nunberg, 1990) previous RSA study findings are silent in regard to the present finding. Clearly the quantitative research designs and instruments of inquiry of these studies were not calibrated in the direction of qualitative findings of practice factionalisation and orientation. The present finding is seen to add a new dimension of inquiry for future RSA studies and extends the level of inquiry of the Moon *et al.* (1998) USA finding of 'forecast demand, plan supply'.

5) **The practice is manpower and resource rich but know-how poor.**

The investigation of the nine '*de jures*' found 26 employees were engaged in the practice of developing forecasts and another 74 employees were engaged in the administration of these forecasts (Exhibit 5.30). This computes to an average headcount of just under 10 employees per firm. Total annual salaries paid to these 100 employees amount to approximately R32/\$4.6 million or an average of R3.7 million or \$529 thousand per firm. The '*de jures*' are thus, on the average, allocating R3.7 million of the firm's resources annually on labour forecasting costs (Exhibit 5.34). The '*de jures*' also report their firms fund customised and specialised PC based time-series and econometric software to support their forecasters. High volume SKU forecast '*de jures*' Enivre and Merchant have invested in the multimillion Rand server based forecasting systems SAP APO and Oracle RDF respectively (Exhibits A11,12).

The 11 '*de factos*' report a total of 147 employees of different employment categories engaged in some level and volume of 'forecasting' as part of their primary employment functions. This averages approximately 13 employees per firm that are reported to expend some of their time and resources in developing and reporting forecast information. The '*de facto*' senior analysts are paid an average of R317/\$45 thousand per year, the managers an average of R576/\$82 thousand per year and the directors an average of R1 million or \$147 thousand per year (Exhibit 5.34). An undefined portion of these labour cost investments pay for time devoted to forecasting. 99% of the respondent firms reported the senior management of their firms were highly supportive of their forecasting activities (Exhibit 5.38).

Manpower and resource support findings from previous RSA studies are mixed. Kaye (1985) found 70% of the RSA firms surveyed at that time engaged 3 or less full-time employees in the forecasting arena while 11% of firms engaged 17 or more full-time employees. Nunberg (1990) also found 17 or more full-time employees at 32% of the RSA firms he surveyed and 3 to 5 employees at 20% of the firms. It is reasonable to assume the lower headcounts pertain to '*de jure*' forecasting departments and the higher headcounts to '*de facto*' adjunct forecasting functions and if so the present finding shows '*de jure*' average staff having increased and '*de facto*' average staffing having decreased. With respect to financial resource commitment Kaye (1988) found significant forecasting budgets present at 90% of the firms he surveyed. Wilson (1987) found over 60% of the firms he surveyed made significant investments in econometric software, subscription data and related consulting services. The budget findings of Nunberg (1990) are not useful due to inadequate responses to his survey. None of the previous RSA studies mined sensitive salary or compensation information and did not present any related findings.

The ‘*de jure*’ and ‘*de facto*’ headcount and salary evidence added to the within-case hardware and software investment evidence supports a finding of RSA firms investing significant manpower and resources in the practice in general and the ‘*de jures*’ in particular.

At the same time the application or return on these investments is found wanting. Exhibit 6.1 evidences the ‘*de factos*’ adhere to only one third of the study derived ‘Western benchmarks’ and both factions are found particularly wanting in the all important arena of forecasting *implementation* and *execution* (Exhibit 6.1, Categories A,D,E). The inability or lack of know-how to effectively *implement* negatively impacts the ability to effectively *execute* and this in turn negatively impacts performance measures such as forecast accuracy. The ‘*de jures*’ report average forecast variances experienced at the product or service category level are 25%, 17% and 20% over the 30, 90 and 360 day horizons respectively. The ‘*de factos*’ report average forecast errors experienced at the product or service category level are 12%, 13% and 23% over the 30, 90 and 360 day horizons respectively (Exhibit 5.36). These reported levels of forecast accuracy are found to have not materially improved from comparable findings of previous RSA studies. Kaye (1988) found comparable variances of 20% and opined “*in general the results of forecasts (sic) were not very encouraging. The general feeling was that companies were not getting a fair return on their investment in the forecasting function*”. Nunberg (1990) cited Kaye’s variances to be lower than those he found and believed his respondents over-stated their “*success in forecast accuracy*” and that “*the findings of this research indicate poor levels of familiarisation with forecasting techniques and their inappropriate (sic) application and implementation*”

All in all, it is found that the RSA practice is and has always been well staffed and funded but that these funds may have been disproportionately channelled into salaries, software and hardware at the expense of expertise and know-how. The current level of two thirds adherence of the ‘Western benchmarks’ (Exhibit 6.1) by the ‘*de jures*’ finds some hope of remedy in the future.

6) The practice division of labour is disordered.

Careful examination and analysis of the Chapter 5 within-case summaries and associated forecasting processes reveal that the overwhelming majority of the RSA pool of firms do not follow or even possess a division of labour protocol that is compatible with effective management of a *bona fide* forecasting function and process. Under existing protocols (where they in fact exist), forecast development, administration and usage is found to be commingled, dependent, disordered and in extreme cases perverted. The most extreme case of this disorder is found within the ‘*de factos*’ where one or two managers assume all

pertinent roles acting as prosecutor, jury, judge and executioner and no audit trail is available to determine where the process went wrong and right and how to learn from either lesson in the future. (See within-case summaries of Punters and Greige). This folly and in numerous cases, arrogance, is not restricted to the case of a small number of managers but clear evidence has been found where this labour commingling has occurred across 25 or more employees (See within-case summary of Damas).

In the case of the '*supply de jures*' the developers of their forecasts are found to be have a conflict of interest as they do not work independently of the users of the forecasts namely, the manufacturing or operations wing of the firm. As a result of this conflict of interest they do not know whether they should deliver forecasts (grounded in market demand) which they suspect will not be met by factory capacity constraints or whether they should produce more 'accurate' supply forecasts which perpetuate the sub-optimisation potential of the firm as a whole. More often than not they produce the latter forecast rather than the former. Lumbers on page 82 is found as the critical case evidence of this poor practice. The finding is consistent with the Moon *et al.* (1998) thematic finding that many of the USA firms in their studies do not forecast demand and plan supply rather they forecast supply, plan supply and ignore demand. The present finding extends the Moon *et al.* (1998) finding by focussing on one of the causes of this behaviour namely, a disordered division of labour.

The '*demand de jures*' are found to come close to a division of labour protocol compatible with a *bona fide* forecasting function and process but fall short in the general quality of the distribution of labour. Currently the '*demand de jures*' field a few master's level forecast developers whose work product is passed on to a brigade of matriculants/high school graduates whose mandate it is to ensure suppliers, senior managers and directors understand, respect and implement the good faith efforts of the forecast developers. Unfortunately, evidence uncovered during the interview process show the matric level conveyers/presenters of the forecast fall far short of the needed quality and skills to fulfil required mandates. Lucre is found to be a notable exception to all the aforementioned shortcomings. The division of labour protocol adopted by Lucre consists of the economics department providing macro background forecasts, while equity and fixed income analysts produce earnings and yield forecasts which senior level portfolio managers vet prior to presentation to the division and groups CEOs. The latter rarely make changes to the presentation recommendations of the portfolio managers (See within-case summary of Lucre).

Previous RSA studies are to all intents and purposes silent on the present finding save for Kaye (1988) indicating that friction, scepticism and mistrust existed amongst the developers and users of the forecasts at the firms he surveyed. The present finding elevates the knowledge base to consider that this disorder is more complicated than mere department

or political rivalry, rather the problem and the solution lies with the quality of staffing and mandating at each stage of the forecasting process shown in Exhibits 4.1, 4.3 and 4.4.

7) The forecasting processes adopted by RSA firms are both tactically and strategically flawed.

The majority of within-case summaries in Chapter 5 provides a forecasting process exhibit that was constructed *in situ* by the respondent either by hand-drawn sketches, electronic design on the author's laptop computer or from documents provided by the respondent at the time of the interview. In some cases both 'real time' sketches were provided followed by more comprehensive 'already prepared' electronic versions. The 'real time' constructions were either the result of a response to auto driving prompt 1 (Exhibit 4.6) or the initiative of the respondent. As a result of the aforementioned *modus operandi*, evidence exhibits 5.1 through 5.15 are the unedited and unadulterated depictions of the forecasting processes followed at each respondent's firm according to the rendering and testimony of the respondent. From these unedited renditions and the narratives of simpler processes contained in other within-case summaries it is found that not a single firm in the RSA pool conduct their forecasting activities within the framework of a 'closed loop' or circular connected process (Exhibit 5.16). Only one firm from the RSA pool, Loaners reports evidence of adaptation (Exhibit 5.3).

This practice evidences a strategic process flaw as accountability, continuous improvement and adaptation are not objectively and systematically addressed or are by-passed. In contrast Weinstein (Exhibit 2.11), Makridakis *et al.* (Exhibit 2.12) and Yeomans and Bendixen (Exhibit 3.3) are all found to explicitly prescribe 'closed loop' or iterative designs as critical or strategic characteristics of any forecasting process or 'system'. A finding of improvement or deterioration in this flaw in relation to previous RSA studies is not clear. Nunberg (1990) found "*there was no forecasting system among any of the companies interviewed*". Kaye (1985) did not survey any firm's forecasting process and Yeomans and Bendixen (1988) despite prescribing an iterative process conducive to continuous improvement did not investigate the adoption of their prescription. It is however the sense of the present study, considering the levels of understanding and adherence to pertinent study derived 'Western benchmarks' found during the interview process, that some improvement in the design and implementation of RSA forecasting processes has occurred over the years. Notwithstanding, much more improvement is found to be necessary.

With respect to tactical flaws, it was found during the interview process that different departments within the same firm forecast the same business variables without any communication or reconciliation between the different departments. Ebriete (Exhibit 5.5) is a

typical example of this missing linkage. This finding is consistent with the “*islands of analysis*” finding of Moon (1998). Moon (1998) found that multiple or ‘black market’ forecasting processes existing at the same firm were “*detrimental to corporate performance*”. Fildes and Hastings (1994) also found that “*inadequate linkages between departments can undermine the value of any forecasting procedure*”.

Another RSA tactical process flaw was evidenced by the complete absence of explicit and systematic consideration or action with respect to the elasticities/impacts of external market, industry and economic conditions. Apart from Loaners and Lucre, the RSA responding firms are found to either explicitly or implicitly believe their internal operations are inelastic to these forces or they do not meet the necessity bar of explicit and systematic consideration. Critical case evidence to this effect was found at Merchant and Damas. Statements to the effect that “*marketing is looking at those factors and they hire external consultants from time to time to help*” were transcribed. The prevalence of this unfortunate tactical flaw appears to have increased since Wilson (1987) who found that only 36% of the RSA firms he surveyed did not make use of any econometric modelling, industry or market service bureaus or consultants. Fildes and Hastings (1994) ironically found that although the processes at the ten divisions of the UK multinational firm they interviewed were ‘open to flows’ of market research and other types of ‘environmental’ information the divisional forecasters reported the actual amount of external information received was inadequate. It appears that the tactical process flaw at the UK multinational is found to be one of process execution while the present RSA finding is one of flawed process design and recognition. The two findings are consistent in deficiency but vary in the nature of the deficiency.

The importance of the present finding cannot be understated in the context of enhancing the knowledge base. Previous RSA studies have not *qualitatively* investigated the forecasting processes deployed by RSA firms and have not reported any findings. ‘Western benchmark’ studies (Mentzer *et al.*, 1995; Moon *et al.*, 2003; Armstrong, 2001 and Jain 2001-2007) mention processes as part of their ‘benchmark’ deliberations but do not report any specific *qualitative* assessment findings. The present finding redresses these voids by focussing attention on and categorising the different types of process flaws.

In summary, RSA firms are found to exhibit three types of process flaws. The first flaw (as detailed above) is the stand-alone strategic flaw of the utilization of an open-ended, non-iterative, non-adaptive ‘process’ which could, with a strict interpretation, be reclassified as merely a series of discrete forecasting events not a *bona fide* process. The second set of process flaws (as detailed above) are found to be tactical in nature. The third, less obvious flaw, is a derivative or cumulative strategic flaw as the cumulative weight of a

series of tactical omissions and flaws result in a derived strategic flaw. Specifically, the finding of almost universal exclusion of the formal and systematic integration of external market and industry analysis in the investigated RSA processes may be seen, *a priori*, as only a tactical flaw or omission. However, when one considers the impact of such an omission one quickly realises this ‘tactical’ omission results in a strategic flaw. The strategic flaw is one of missed/misread market, industry and country business opportunities. In today’s highly competitive global environment this maladaptive practice is indeed one that few firms can absorb over prolonged periods of time.

6.4 Implications for the Practice of Business Forecasting

The evidence gathered in Chapter 5 and the resultant findings detailed in Section 6.3 are seen to have significant implications for the different parties involved in the practice of business forecasting in South Africa and other countries.

For the RSA practitioners who participated in the study a detailed individual assessment of the quality of their respective practices in the context of a portfolio of study derived ‘Western benchmarks’ has been provided in Appendix A and a comparative assessment has been provided in Chapter 5. The strengths and weaknesses of their practices and those of other RSA firms have been clearly summarised in the findings (Section 6.3). Specifically, the ‘*de jures*’ are found to adhere to two thirds of the ‘benchmarks’ and have had their practice implementation and execution weaknesses identified. The study has identified to the ‘*de factos*’ that they adhere to only one third of the ‘benchmarks’ and the opportunities for improvement extend across a broad spectrum of practice categories. The study has therefore offered useful insight into the practice challenges and opportunities. The participating practitioners can either accept the status quo or takes steps to improve upon their practices in proportion to the level of investment their firms currently make in the practice. This challenge and opportunity is quite consistent with the ‘*as is, should be and way forward*’ states identified by Moon *et al.* (2003).

For the practitioners at other firms who are troubled by the results and quality of forecasting activities at their firms this study and its findings can serve as a useful evaluative manual. Through the process of naturalistic generalisation these practitioners may assess the standings of their practice against the ‘roadmap’ of ‘benchmarks’ listed in Exhibit 4.5. The functioning or malfunctioning of their processes can be assessed against the recommended process shown in Appendix B. Practitioners at other firms may also find it beneficial to assess whether their forecasting posture is defensive or offensive and if the division of labour is disordered.

For the officers/directors of RSA and other firms charged with providing manpower, hardware and software support for their firm’s forecasting practice, this study and its findings can be used as an investment guide. Specifically, these officers/directors are routinely required to undertake due dili-

gence exercises prior to deciding on requests for forecasting manpower, hardware and software. Pertinent information such as the present study finding that the RSA practice is and has always been well staffed and funded but that these funds may have been disproportionately channelled into salaries, software and hardware at the expense of expertise and know-how may assist these officers in asking the right questions. This study suggests that the *'de factos'* have too little software (spreadsheets) to do their forecasting tasks properly (Exhibit 5.38), while some *'de jures'* may have too much software for their own good. The latter condition results from the technical and functional capabilities of the software exceeding the forecasting education and know-how of the user. Armed with the study forecast development 'benchmarks' and associated attributes shown in the Appendix A within-case summaries these practitioners are more likely to make more informed decisions based on *real* rather than perceived need.

For the in-house and external consultants who routinely perform practice and process 'audits' the present study 'Western benchmarks' and recommended process provides an alternative evaluative 'audit' protocol to previous offerings (Fildes and Hastings, 1994; Mentzer *et al.*, 1999; Armstrong, 2001; Jain, 2003). The present study explicitly considers the cultural dimension of the practice and the findings related to factionalisation and tribalisation that may be particularly useful in determining the presence or absence of *'de jures'* and *'de factos'* at other firms. This *a priori* determination in turn will be particularly useful in understanding and evaluating subsequent practice behaviour.

6.5 Study Limitations and Recommendations for Future Research

A number of paths for future research are opened by the present study. Some paths are opened due to the strengths of the study and others due to its limitations. Some of the limitations are specific to the present study, some are common to most studies investigating forecasting practices and practice benchmarks.

The most significant common limitation is the lack of universally recognised and established benchmarks in the literature. This limitation requires researchers to independently develop and advocate their own benchmarks (Mentzer *et al.*, 1999; Armstrong, 2001; Jain, 2007), adopt the benchmarks of the others (Green, 2001; Green & Weaver, 2005; Watson, 1996) or derive and advocate their own as in the case of the present study. None of the resultant benchmarks meet all the 'stress tests' of Camp (1989) foremost of which is the lack of universal recognition.

To remedy this limitation future research needs to undertake a project of the development of gold standard forecasting benchmarks. To achieve this future research goal, the approaches of the medical, accounting and CFA professions may need to be consulted as gold standard benchmarks used by these professions are usually the result of consortium or institutional research and not individual research. The last extensive on point institutional research undertaken was by the non-profit, USA

based Conference Board nearly 30 years ago. This research gave the knowledge base *inter alia*, insights into the forecasting practices and processes at the Cummins Engine Company.

Other common limitations include limited access to sensitive evidence and prolonged observation of the forecasting process reported by the respondents. Due to the prevalence of legal non-disclosure agreements and other company information restrictions the study researcher was unable to attend forecasting meetings or observe interactions between the developers and users of forecast information. As a result, the important research step of the verification of each respondent's evidence was limited. This limitation is a fact of research and such further related study is unlikely to provide any additional useful information.

In addition to the common limitations, one limitation specific to the present study relates to the fact that evidence and findings were harvested from *in situ* interviews of middle and senior managers at 20 RSA firms. Access to the higher level CEOs or managing directors of the firms was not provided to the study. This level of access would have been very useful in understanding the high level rationale or decision making that resulted in the *a priori* or antecedent formation of the '*de jures*' and '*de factos*'.

To redress this limitation an Eisenhardt and Bourgeois (1988) style of study investigating the 'politics' and the 'how' and 'why' CEOs and MDs make or do not make forecasting decisions at high velocity firms is recommended. The Eisenhardt and Bourgeois (1988) study investigated the politics of strategic decision making utilising a theoretical sample of eight San Francisco based micro-computer firms. A high velocity environment for the proposed study is preferred as it is deemed to be the most difficult or challenging forecasting environment for industrial firms.

Another path for future research is predicated upon one of the present study's perceived strengths rather than its limitations. Specifically, the present study adopted a multi-method, ethnographic strategy to understand and provide insights into the often ignored cultural aspects of the practice. To further enrich the knowledge base on this theme, an ethnographic study of the forecasting practices of a pool of US, Japanese and German firms is recommended. One of the primary aims of the study would be to assess whether corporate culture is deterministic of corporate forecasting practices and which culture promotes or hinders excellence in forecasting management.

6.6 Study Conclusions

The evidence and findings of this study fulfil aims, share lessons learned and offer improvements in the quality of practice and research of business forecasting in South Africa. The lessons learned and improvements are seen as transferable to like practices and research in 'Western' countries.

One of the key aims of the study was to assess the present condition and quality of the business forecasting practices of RSA firms in the context of 'Western' standards of practice. On first impression the answer to this assessment question appears simple. RSA practices either met, exceeded or lagged the standards of 'Western' practices. However, a significant finding of this study is that the RSA practice is *not* a single, homogenous practice rather it is complex, multiple and heterogeneous. In short, RSA business forecasting in reality is conducted by multiple practices that are *a priori* culturally determined. In this more complex light, the answer to the key assessment question at hand is that one of the practices manned by full-time, specially selected forecasting professionals is materially on par with the 'Western' standards of practice. Another practice manned on a part-time, *ad-hoc* basis from professions other than forecasting (accounting and finance) is significantly below par. The assessment details are shown in Exhibit 6.1.

Two important lessons can be learned from this assessment finding that can improve future business forecasting practices and related research. Firstly, *a priori* cultural determination of a firm's forecasting function is shown to influence both positive and negative practices. Fildes and Hastings (1994) concluded "*forecasting improvement is at least in the case organization, a question of organizational design*". The lesson of the present study is consistent with and extends this conclusion to include cultural determinants in the design. Secondly, future research assessments of the standing of the practices of RSA firms need to be differentiated. All previous RSA survey assessment studies generated findings based upon undifferentiated statistical samples. In light of the multi-practice findings of the present study more accurate assessments are likely to be obtained from differentiated practice evidence. Both of the above lessons learned and offers of improvement are transferable to 'Western' practices as evidenced by the conclusions of Winklhofer and Diamantopoulos (1996). The latter's conclusions on the practices of UK industrial exporters featured "*antecedent characteristics*" and insights into the practices of two different groups of forecasters at the same firms.

The other key aim of the study was to guide and assist RSA and 'Western' firms in recognising and using high quality practices and processes. To fulfil this aim the study triangulated evidence from the literature of the last 30 years with the study's evidence and findings. 15 offerings (four from RSA) related to practices, processes and 'benchmark' measures were reviewed and deconstructed for RSA and 'Western' practitioners and researchers. The literature provides a limited number of offerings that view adherence with certain standards or 'benchmarks' and observance of certain processes as synonymous with good practices and processes

The lesson learned from the deconstruction is that the limited literature 'benchmarks' offerings were conflicted or silent as to the favourable performance outcome of adherence, the advocated processes were divorced from or independent of the 'benchmarks' and most significantly, the 'benchmarks' were not established as a measuring gold standard. To overcome most of these shortcomings and achieve its aim, the study derived a 'roadmap' of 'benchmarks' from the best of

the literature offerings and married or closely integrated a process into the derived ‘benchmarks’. The integrated process performs the additional functions of ‘operationalizing’ the ‘benchmarks’ and building credibility in the adherence process by measuring the accuracy and execution of the forecasts at each stage of the process. These measurement, recognition and guiding tools or products are offered to RSA and ‘Western’ practitioners and researchers as Exhibit 4.5 and Appendix B for testing and validation through ‘naturalistic generalisation’.

The last piece of the recognition, assistance and guidance triangle leverages the study’s seven RSA findings. Armstrong (1982) offered the knowledge base 16 “*pitfalls and solutions to forecasting*” (Exhibit 2.1) and Moon *et al.* (1998) offered their “*Seven Keys to Better Forecasting*”. The ‘keys’ are: (1) “*understand what forecasting is, and what it is not*, (2) *forecast demand, plan supply*, (3) *communicate, cooperate and collaborate*, (4) *eliminate islands of analysis*, (5) *use tools wisely*, (6) *make it important* and (7) *measure, measure and measure*”. The practice focus of both offerings is essentially tactical.

To support and extend these contributions the present study offers the knowledge base ‘Seven Alerts to the Practice of Forecasting’. These alerts mirror the study’s RSA findings. They are primarily strategic and state: (1) beware of cultural factionalisation, (2) assess your and the competition’s forecasting practice strengths and weaknesses, (3) focus externally as well as internally, (4) position offensively, (5) invest in forecasting know-how, (6) divide forecasting labour by speciality and (7) above all, avoid tactical and strategic forecasting process flaws.

Appendix A

A.1 Within-Case Summaries of 20 South African Respondent Firms

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Punt		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental			
	Analog		Unremarkable Incident of:	
	Delphi		1. Benchmark Non-Existence or Not-Applicable or	
	Diffusion		2. Criteria Non-Existence or Not-Applicable or	
	PERT		3. Attribute Non-Existence or Not-Applicable	
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	10		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.1: Punters Ltd Within-Case Summary

Within-case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Punt		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		2	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager	450		
	Director	1,750		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month	4		
	Firm-One Quarter	3		
	Firm-One Year	3		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.1 (Continued): Punters Ltd Within-Case Summary

Within-case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Lumb		
Exist		Green	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Open Ended		Green		
Closed loop Adaptive		Red		
Forecast Development				
Top-Down Bottom-Up		Yellow	Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Type of Method	Time Series	Green	Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
	Averages	Green		
	Box Jenkins	Yellow		
	Decomposition	Yellow	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	Yellow
	Exp Smoothing	Green		
	Simple Trend	Yellow		
	Cause & Effect	Red		
	Econometric	Yellow		
	Neural	Yellow		
	Regression	Yellow		
	Judgmental	Green		
	Analog	Yellow		
	Delphi	Yellow		
	Diffusion	Yellow		
	PERT	Yellow		
	Other / Survey	Green		
Forecasting Horizon	One Month	Yellow		
	One Quarter	Yellow		
	One Year	Green		
	Over a Year	3		
Periodicity of Forecast Generated	Daily	Yellow		
	Weekly	Green		
	Monthly	Yellow		
	Quarterly	Green		
	Annual	Green		
	Over a Year	Green		
Forecast Revision	Continuous	Yellow		
	Daily	Yellow		
	Weekly	Yellow		
	Monthly	Yellow		
	Quarterly	Green		
	Annual	Yellow		
	Over a Year	Yellow		
Integration and Presentation				
Reconciliation of Different Forecasts		Yellow		
No Conflicts Affecting Accuracy		Red		
Number of Forecasts Used		1		
Integration of Forecasts		Yellow		
Consensus Meetings		Red		
Forecaster Driven		Green		
Functional Dept. Driven		Yellow		
Senior Management Presentation		Green		
Senior Management Changes		Green		
Forecast Implementation				
Track Implementation		Green		
Perform to forecast		Red		
Track Variance		Green		
Reconciliation of Variance		Red		
Forecast Quality Control				
Track Forecast 'In' Quantity		Green		
Track Forecast 'Out' Quantity		Green		
Track Actual		Green		
Measure Forecast 'In' Variance		Red		
Measure Forecast 'Out' Variance		Red		
Variance Feedback to Development		Red		
Feedback Impact		Red		

Exhibit A.2: Lumbers Ltd Within-Case Summary

Within-case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Lumb		
Existence of a Department			Evidence Supports:	
Age of Department in Years		4	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		2	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		2	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Masters			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	280		
	Senior Analyst	420		
	Manager	650		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month	45		
	SKU-One Quarter	45		
	SKU-One Year	30		
	Cat-One Month	40		
	Cat-One Quarter	40		
	Cat-One Year	20		
	Firm-One Month	30		
	Firm-One Quarter	25		
	Firm-One Year	20		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.2 (Continued): Lumbers Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Loan		
Exist		Green	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Open Ended		Green		
Closed loop		Red		
Adaptive		Green		
Forecast Development				
Top-Down		Green	Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Bottom-Up		Green		
Type of Method	Time Series	Green	Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
	Averages	Yellow		
	Box Jenkins	Green		
	Decomposition	Green	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	Yellow
	Exp Smoothing	Green		
	Simple Trend	Yellow		
	Cause & Effect	Green		
	Econometric	Green		
	Neural	Yellow		
	Regression	Green		
	Judgmental	Green		
	Analog	Yellow		
	Delphi	Yellow		
	Diffusion	Yellow		
PERT	Yellow			
Other / Survey	Green			
Forecasting Horizon	One Month	Yellow		
	One Quarter	Yellow		
	One Year	Yellow		
	Over a Year	Green 3		
Periodicity of Forecast Generated	Daily	Yellow		
	Weekly	Yellow		
	Monthly	Green		
	Quarterly	Green		
	Annual	Green		
	Over a Year	Yellow		
Forecast Revision	Continuous	Yellow		
	Daily	Yellow		
	Weekly	Yellow		
	Monthly	Yellow		
	Quarterly	Green		
	Annual	Yellow		
Over a Year	Yellow			
Integration and Presentation				
Reconciliation of Different Forecasts		Red		
Conflicts of Interest Affect Accuracy		Green		
Number of Forecasts Used		Red 2		
Integration of Forecasts		Red		
Consensus Meetings		Green		
Forecaster Driven		Green		
Functional Dept. Driven		Green		
Senior Management Presentation		Green		
Senior Management Changes		Green		
Forecast Implementation				
Track Implementation		Red		
Perform to forecast		Red		
Track Variance		Green		
Reconciliation of Variance		Green		
Forecast Quality Control				
Track Forecast 'In' Quantity		Red		
Track Forecast 'Out' Quantity		Red		
Track Actual		Green		
Measure Forecast 'In' Variance		Red		
Measure Forecast 'Out' Variance		Red		
Variance Feedback to Development		Green		
Feedback Impact		Green		

Exhibit A.3: Loaners Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Loan		
Existence of a Department			Evidence Supports:	
Age of Department in Years		30	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		5	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		5	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	400		
	Senior Analyst	600		
	Manager	800		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter	10		
	Cat-One Year	10		
	Firm-One Month			
	Firm-One Quarter	10		
	Firm-One Year	10		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.3 (Continued): Loaners Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Netwk		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year			
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.4: Network plc Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Netwk		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance		Remarkable Incident of:	
	Forecasting		1. Benchmark not being Met at Firm or	
	Logistics		2. Criteria Existence or Non-Existence or	
	Marketing		3. Attribute Existence or Non-Existence	
	Operations/Prod			
	Sales			
	Strategic Planning			
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		20	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager	700		
	Director	1,000		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter	15		
	Cat-One Year			
	Firm-One Month			
	Firm-One Quarter	5		
	Firm-One Year	5		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.4 (Continued): Network plc Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Retail		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
PERT				
Other / Survey				
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
Over a Year				
Integration and Presentation				
Reconciliation of Different Forecasts				
Conflicts of Interest Affect Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.5: Retailers Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Retail		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		25	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager	450		
	Director	650		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	5		
	Cat-One Quarter	5		
	Cat-One Year			
	Firm-One Month	5		
	Firm-One Quarter	5		
	Firm-One Year	10		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.5 (Continued): Retailers Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Ebriet		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing		Remarkable Incident of:	
	Simple Trend		1. Benchmark not being Met at Firm or	
	Cause & Effect		2. Criteria Existence or Non-Existence or	
	Econometric		3. Attribute Existence or Non-Existence	
	Neural			
	Regression		Unremarkable Incident of:	
	Judgmental		1. Benchmark Non-Existence or Not-Applicable or	
	Analog		2. Criteria Non-Existence or Not-Applicable or	
	Delphi		3. Attribute Non-Existence or Not-Applicable	
	Diffusion			
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	5		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.6: Ebriete plc Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Ebriet		
Existence of a Department			Evidence Supports:	
Age of Department in Years		15	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		3	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		11	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	450		
	Senior Analyst			
	Manager	600		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month	46		
	SKU-One Quarter			
	SKU-One Year	80		
	Cat-One Month	15-20		
	Cat-One Quarter	20-30		
	Cat-One Year	50-60		
	Firm-One Month	8		
	Firm-One Quarter	10		
	Firm-One Year	10		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.6 (Continued): Ebriete plc Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Cant		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
Conflicts of Interest Affect Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.7: Canteens (Pty) Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Cant		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance			
	Forecasting			
	Logistics			
	Marketing			
	Operations/Prod			
	Sales			
	Strategic Planning		Remarkable Incident of:	
	Supply Chain		1. Benchmark not being Met at Firm or	
	Research		2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
			Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		15	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	84		
	Senior Analyst	280		
	Manager			
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	10		
	Cat-One Quarter	10		
	Cat-One Year	5-10		
	Firm-One Month	10		
	Firm-One Quarter	10		
	Firm-One Year	15		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other	Axapta		
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.7 (Continued): Canteens (Pty) Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Merit		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Type of Method	Time Series			
	Averages			
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
			1. Benchmark not being Met at Firm or	
			2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
	Econometric			
	Neural			
	Regression			
	Judgmental		Unremarkable Incident of:	
			1. Benchmark Non-Existence or Not-Applicable or	
			2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
	Analog			
	Delphi			
	Diffusion			
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.8: Maritime Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Merit		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		4	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager	700		
	Director	1,000		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter	20		
	Cat-One Year			
	Firm-One Month			
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.8 (Continued): Maritime Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Greig		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year			
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
Conflicts of Interest Affect Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.9: Greige Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Greig		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		3	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	120		
	Senior Analyst	240		
	Manager	360		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month			
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.9 (Continued): Greige Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Boiss		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
PERT				
Other / Survey				
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
Over a Year				
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.10: Boisson Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department				
Existence of a Department		Boiss		
Age of Department in Years		1	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	
Independent Unit				
Established Accuracy Record				
Forecasting Perceived as Credible				
Line Function				
Staff Function			Evidence does not fully Support: 1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance Forecasting Logistics Marketing Operations/Prod Sales Strategic Planning Supply Chain Research		Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	
Number of Forecasters		3	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	
Employees Engaged in Forecasting		3		
Background	Fin/Accounting Marketing Sales Statistics/Maths Operations Economics			
Education	High School Bachelor's Master's Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst Senior Analyst Manager Director Vice President	360 600 720		
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week SKU-One Month SKU-One Quarter SKU-One Year Cat-One Month Cat-One Quarter Cat-One Year Firm-One Month Firm-One Quarter Firm-One Year	10 5 5 10 5 5 10 5 5		
Organizational Support				
Support of Upper Management	Highly Somewhat No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology Manugistics Oracle SAP Other			
Separate software				
Forecasting Software	Spreadsheet Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.10 (Continued): Boisson Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Merc		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Type of Method	Time Series			
	Averages			
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect			
	Econometric			
	Neural			
	Regression			
	Judgmental			
	Analog			
	Delphi			
	Diffusion			
	PERT			
	Other / Survey			
			Remarkable Incident of:	
			1. Benchmark not being Met at Firm or	
			2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
			Unremarkable Incident of:	
			1. Benchmark Non-Existence or Not-Applicable or	
			2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	1.5		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.11: Merchant Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Merc		
Existence of a Department			Evidence Supports:	
Age of Department in Years		5	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research			Unremarkable Incident of:
Number of Forecasters		2	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		35	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	250		
	Senior Analyst	350		
	Manager	500		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month	40		
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	40		
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month	2		
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.11 (Continued): Merchant Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Eniv		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental			
	Analog		Unremarkable Incident of:	
	Delphi		1. Benchmark Non-Existence or Not-Applicable or	
	Diffusion		2. Criteria Non-Existence or Not-Applicable or	
	PERT		3. Attribute Non-Existence or Not-Applicable	
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	5		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.12: Enivre Group Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Eniv		
Existence of a Department			Evidence Supports:	
Age of Department in Years		20	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		6	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		6	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst	350		
	Manager	500		
	Director	800		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month	33		
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month	3		
	Firm-One Quarter			
	Firm-One Year	20		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.12 (Continued): Enivre Group Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		AB-W		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Type of Method	Time Series			
	Averages			
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year			
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.13: ATM Group Ltd- Wealthy Business Segment Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		AB-W		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance			
	Forecasting			
	Logistics			
	Marketing			
	Operations/Prod			
	Sales			
	Strategic Planning		Remarkable Incident of:	
	Supply Chain		1. Benchmark not being Met at Firm or	
	Research		2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
			Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		1	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst	400		
	Manager	750		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	20		
	Cat-One Quarter	10		
	Cat-One Year	10		
	Firm-One Month			
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.13 (Continued): ATM Group Ltd- Wealthy Business Segment Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		AB-L		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year			
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		1		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.14: ATM Group Ltd- Low Income Segment Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		AB-L		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible			Evidence does not fully Support:	
Line Function			1. Benchmark being Met at Firm or	
Staff Function			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance		Remarkable Incident of:	
	Forecasting		1. Benchmark not being Met at Firm or	
	Logistics		2. Criteria Existence or Non-Existence or	
	Marketing		3. Attribute Existence or Non-Existence	
	Operations/Prod			
	Sales			
	Strategic Planning			
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		1	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting		3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst	400		
	Manager	750		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	6		
	Cat-One Quarter	19		
	Cat-One Year	65		
	Firm-One Month			
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.14 (Continued): ATM Group Ltd- Low Income Segment Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Night		
Exist		Green	Evidence Supports: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Green
Open Ended		Green		
Closed loop		Red		
Adaptive		Yellow		
Forecast Development				
Top-Down		Green	Evidence does not fully Support: 1. Benchmark being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	Yellow
Bottom-Up		Green		
Type of Method	Time Series	Red	1. Benchmark not being Met at Firm or 2. Criteria Existing at Firm or 3. Attribute Existing at Firm	
	Averages	Yellow		
	Box Jenkins	Yellow		
	Decomposition	Yellow	Remarkable Incident of: 1. Benchmark not being Met at Firm or 2. Criteria Existence or Non-Existence or 3. Attribute Existence or Non-Existence	Red
	Exp Smoothing	Yellow		
	Simple Trend	Yellow		
	Cause & Effect	Red		
	Econometric	Yellow	Unremarkable Incident of: 1. Benchmark Non-Existence or Not-Applicable or 2. Criteria Non-Existence or Not-Applicable or 3. Attribute Non-Existence or Not-Applicable	Yellow
	Neural	Yellow		
	Regression	Yellow		
	Judgmental	Green		
	Analog	Yellow		
	Delphi	Yellow		
Diffusion	Yellow			
PERT	Yellow			
Other / Survey	Yellow			
Forecasting Horizon	One Month	Yellow		
	One Quarter	Yellow		
	One Year	Green		
	Over a Year	Yellow		
Periodicity of Forecast Generated	Daily	Yellow		
	Weekly	Yellow		
	Monthly	Green		
	Quarterly	Yellow		
	Annual	Yellow		
Forecast Revision	Over a Year	Yellow		
	Continuous	Yellow		
	Daily	Yellow		
	Weekly	Yellow		
	Monthly	Yellow		
	Quarterly	Green		
Annual	Yellow			
Over a Year	Yellow			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy		Red		
Number of Forecasts Used		2		
Integration of Forecasts		Green		
Consensus Meetings		Green		
Forecaster Driven		Yellow		
Functional Dept. Driven		Green		
Senior Management Presentation		Green		
Senior Management Changes		Green		
Forecast Implementation				
Track Implementation		Red		
Perform to forecast		Green		
Track Variance		Green		
Reconciliation of Variance		Green		
Forecast Quality Control				
Track Forecast 'In' Quantity		Green		
Track Forecast 'Out' Quantity		Green		
Track Actual		Green		
Measure Forecast 'In' Variance		Red		
Measure Forecast 'Out' Variance		Red		
Variance Feedback to Development		Red		
Feedback Impact		Red		

Exhibit A.15: Nightingale Group Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Night		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance			
	Forecasting			
	Logistics			
	Marketing			
	Operations/Prod			
	Sales			
	Strategic Planning		Remarkable Incident of:	
	Supply Chain		1. Benchmark not being Met at Firm or	
	Research		2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
			Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		50	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	130		
	Senior Analyst	300		
	Manager	600		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	10		
	Cat-One Quarter	7		
	Cat-One Year	5		
	Firm-One Month	8		
	Firm-One Quarter	5		
	Firm-One Year	4		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.15 (Continued): Nightingale Group Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Dinero		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Type of Method	Time Series			
	Averages			
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.16: Dinero (Pty) Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Dinero		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance		Remarkable Incident of:	
	Forecasting		1. Benchmark not being Met at Firm or	
	Logistics		2. Criteria Existence or Non-Existence or	
	Marketing		3. Attribute Existence or Non-Existence	
	Operations/Prod			
	Sales			
	Strategic Planning			
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		1	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager			
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month			
	Firm-One Quarter	15		
	Firm-One Year	25-30		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.16 (Continued): Dinero (Pty) Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Libris		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Type of Method	Time Series			
	Averages			
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
Conflicts of Interest Affect Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.17: Libris (Pty) Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Libris		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible			Evidence does not fully Support:	
Line Function			1. Benchmark being Met at Firm or	
Staff Function			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance		Remarkable Incident of:	
	Forecasting		1. Benchmark not being Met at Firm or	
	Logistics		2. Criteria Existence or Non-Existence or	
	Marketing		3. Attribute Existence or Non-Existence	
	Operations/Prod		Unremarkable Incident of:	
	Sales			
	Strategic Planning			
	Supply Chain			
	Research			
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		12	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	200		
	Senior Analyst	250		
	Manager	500		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	15-20		
	Cat-One Quarter	10-15		
	Cat-One Year	20		
	Firm-One Month	15-20		
	Firm-One Quarter	10-15		
	Firm-One Year	20		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.17 (Continued): Libris (Pty) Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Lucre		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition		Remarkable Incident of:	
	Exp Smoothing		1. Benchmark not being Met at Firm or	
	Simple Trend		2. Criteria Existence or Non-Existence or	
	Cause & Effect		3. Attribute Existence or Non-Existence	
	Econometric			
	Neural		Unremarkable Incident of:	
	Regression		1. Benchmark Non-Existence or Not-Applicable or	
	Judgmental		2. Criteria Non-Existence or Not-Applicable or	
	Analog		3. Attribute Non-Existence or Not-Applicable	
	Delphi			
	Diffusion			
	PERT			
	Other / Survey			
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.18: Lucre plc Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Lucre		
Existence of a Department			Evidence Supports:	
Age of Department in Years		30	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
Number of Forecasters		2	Unremarkable Incident of:	
Employees Engaged in Forecasting		12	1. Benchmark Non-Existence or Not-Applicable or	
Background	Fin/Accounting		2. Criteria Non-Existence or Not-Applicable or	
	Marketing		3. Attribute Non-Existence or Not-Applicable	
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst	720		
	Manager			
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter	10-15		
	Cat-One Year	10-20		
	Firm-One Month			
	Firm-One Quarter			
	Firm-One Year			
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.18 (Continued): Lucre plc Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Nept		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition			
	Exp Smoothing			
	Simple Trend			
	Cause & Effect		Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or	
	Neural		2. Criteria Existence or Non-Existence or	
	Regression		3. Attribute Existence or Non-Existence	
	Judgmental		Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or	
	Delphi		2. Criteria Non-Existence or Not-Applicable or	
	Diffusion		3. Attribute Non-Existence or Not-Applicable	
PERT				
Other / Survey				
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	5		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Integration and Presentation				
Reconciliation of Different Forecasts				
No Conflicts Affecting Accuracy				
Number of Forecasts Used	2			
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.19: Neptune Group Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Nept		
Existence of a Department			Evidence Supports:	
Age of Department in Years			1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
			2. Criteria Existing at Firm or	
			3. Attribute Existing at Firm	
Placement of Forecasting	Finance			
	Forecasting			
	Logistics			
	Marketing			
	Operations/Prod			
	Sales			
	Strategic Planning			
	Supply Chain			
	Research			
			Remarkable Incident of:	
			1. Benchmark not being Met at Firm or	
			2. Criteria Existence or Non-Existence or	
			3. Attribute Existence or Non-Existence	
			Unremarkable Incident of:	
Number of Forecasters			1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		13	2. Criteria Non-Existence or Not-Applicable or	
			3. Attribute Non-Existence or Not-Applicable	
Background	Fin/Accounting			
	Marketing			
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's	10 CAs		
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	200		
	Senior Analyst	350		
	Manager	500		
	Director	750		
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month			
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month	15		
	Cat-One Quarter	20		
	Cat-One Year	30		
	Firm-One Month	5-10		
	Firm-One Quarter	5-10		
	Firm-One Year	15		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.19 (Continued): Neptune Group Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Process		Vache		
Exist			Evidence Supports:	
Open Ended			1. Benchmark being Met at Firm or	
Closed loop			2. Criteria Existing at Firm or	
Adaptive			3. Attribute Existing at Firm	
Forecast Development				
Top-Down			Evidence does not fully Support:	
Bottom-Up			1. Benchmark being Met at Firm or	
Type of Method	Time Series		2. Criteria Existing at Firm or	
	Averages		3. Attribute Existing at Firm	
	Box Jenkins			
	Decomposition		Remarkable Incident of:	
	Exp Smoothing		1. Benchmark not being Met at Firm or	
	Simple Trend		2. Criteria Existence or Non-Existence or	
	Cause & Effect		3. Attribute Existence or Non-Existence	
	Econometric			
	Neural		Unremarkable Incident of:	
	Regression		1. Benchmark Non-Existence or Not-Applicable or	
	Judgmental		2. Criteria Non-Existence or Not-Applicable or	
	Analog		3. Attribute Non-Existence or Not-Applicable	
	Delphi			
	Diffusion			
PERT				
Other / Survey				
Forecasting Horizon	One Month			
	One Quarter			
	One Year			
	Over a Year	2,3		
Periodicity of Forecast Generated	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
	Over a Year			
Forecast Revision	Continuous			
	Daily			
	Weekly			
	Monthly			
	Quarterly			
	Annual			
Over a Year				
Integration and Presentation				
Reconciliation of Different Forecasts				
Conflicts of Interest Affect Accuracy				
Number of Forecasts Used		2		
Integration of Forecasts				
Consensus Meetings				
Forecaster Driven				
Functional Dept. Driven				
Senior Management Presentation				
Senior Management Changes				
Forecast Implementation				
Track Implementation				
Perform to forecast				
Track Variance				
Reconciliation of Variance				
Forecast Quality Control				
Track Forecast 'In' Quantity				
Track Forecast 'Out' Quantity				
Track Actual				
Measure Forecast 'In' Variance				
Measure Forecast 'Out' Variance				
Variance Feedback to Development				
Feedback Impact				

Exhibit A.20: Vache (Pty) Ltd Within-Case Summary

Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department				
Existence of a Department		Vache		
Age of Department in Years		1	Evidence Supports:	
Independent Unit			1. Benchmark being Met at Firm or	
Established Accuracy Record			2. Criteria Existing at Firm or	
Forecasting Perceived as Credible			3. Attribute Existing at Firm	
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		1		
Employees Engaged in Forecasting		1	1. Benchmark Non-Existence or Not-Applicable or	
Background	Fin/Accounting		2. Criteria Non-Existence or Not-Applicable or	
	Marketing		3. Attribute Non-Existence or Not-Applicable	
	Sales			
	Statistics/Maths			
	Operations			
	Economics			
Education	High School			
	Bachelor's			
	Master's			
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst			
	Senior Analyst			
	Manager	450		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week			
	SKU-One Month	23		
	SKU-One Quarter			
	SKU-One Year			
	Cat-One Month			
	Cat-One Quarter			
	Cat-One Year			
	Firm-One Month	5		
	Firm-One Quarter	8		
	Firm-One Year	15		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other			
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.20 (Continued): Vache (Pty) Ltd Within-Case Summary

Within-Case Summary

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol	
Process		Damas			
Exist			Evidence Supports:		
Open Ended			1. Benchmark being Met at Firm or		
Closed loop			2. Criteria Existing at Firm or		
Adaptive			3. Attribute Existing at Firm		
Forecast Development					
Top-Down			Evidence does not fully Support:		
Bottom-Up			1. Benchmark being Met at Firm or		
Type of Method	Time Series		2. Criteria Existing at Firm or		
	Averages		3. Attribute Existing at Firm		
	Box Jenkins				
	Decomposition				
	Exp Smoothing				
	Simple Trend				
	Cause & Effect			Remarkable Incident of:	
	Econometric		1. Benchmark not being Met at Firm or		
	Neural		2. Criteria Existence or Non-Existence or		
	Regression		3. Attribute Existence or Non-Existence		
	Judgmental			Unremarkable Incident of:	
	Analog		1. Benchmark Non-Existence or Not-Applicable or		
	Delphi		2. Criteria Non-Existence or Not-Applicable or		
	Diffusion		3. Attribute Non-Existence or Not-Applicable		
	PERT				
Other / Survey					
Forecasting Horizon	One Month				
	One Quarter				
	One Year				
	Over a Year	5			
Periodicity of Forecast Generated	Daily				
	Weekly				
	Monthly				
	Quarterly				
	Annual				
	Over a Year				
Forecast Revision	Continuous				
	Daily				
	Weekly				
	Monthly				
	Quarterly				
	Annual				
	Over a Year				
Integration and Presentation					
Reconciliation of Different Forecasts					
No Conflicts Affecting Accuracy					
Number of Forecasts Used	2				
Integration of Forecasts					
Consensus Meetings					
Forecaster Driven					
Functional Dept. Driven					
Senior Management Presentation					
Senior Management Changes					
Forecast Implementation					
Track Implementation					
Perform to forecast					
Track Variance					
Reconciliation of Variance					
Forecast Quality Control					
Track Forecast 'In' Quantity					
Track Forecast 'Out' Quantity					
Track Actual					
Measure Forecast 'In' Variance					
Measure Forecast 'Out' Variance					
Variance Feedback to Development					
Feedback Impact					

Exhibit A.21: Damas Ltd Within-Case Summary

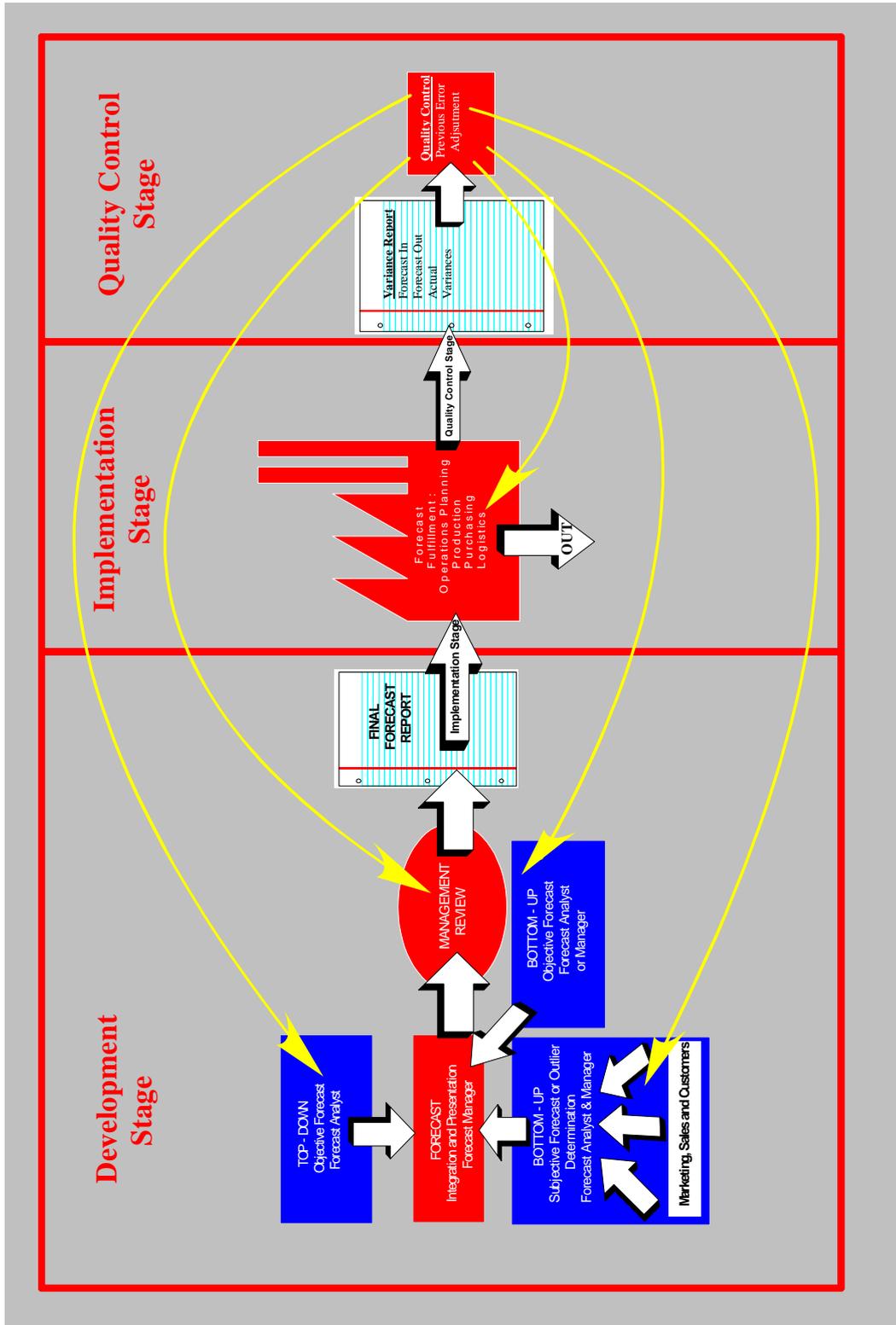
Within-Case Summary Continued

Forecasting Benchmark or Criteria	Attribute	Result	Legend	Symbol
Forecasting Department		Damas		
Existence of a Department			Evidence Supports:	
Age of Department in Years		9	1. Benchmark being Met at Firm or	
Independent Unit			2. Criteria Existing at Firm or	
Established Accuracy Record			3. Attribute Existing at Firm	
Forecasting Perceived as Credible				
Line Function			Evidence does not fully Support:	
Staff Function			1. Benchmark being Met at Firm or	
Placement of Forecasting	Finance		2. Criteria Existing at Firm or	
	Forecasting		3. Attribute Existing at Firm	
	Logistics			
	Marketing		Remarkable Incident of:	
	Operations/Prod		1. Benchmark not being Met at Firm or	
	Sales		2. Criteria Existence or Non-Existence or	
	Strategic Planning		3. Attribute Existence or Non-Existence	
	Supply Chain			
	Research		Unremarkable Incident of:	
Number of Forecasters		25	1. Benchmark Non-Existence or Not-Applicable or	
Employees Engaged in Forecasting		25	2. Criteria Non-Existence or Not-Applicable or	
Background	Fin/Accounting	8	3. Attribute Non-Existence or Not-Applicable	
	Marketing			
	Sales			
	Statistics/Maths	2		
	Operations	15		
	Economics			
Education	High School	15		
	Bachelor's	8		
	Master's	2		
	Doctorate			
Salaries of Forecasting Employees (In R,000)	Analyst	150-200		
	Senior Analyst	250-400		
	Manager	500		
	Director			
	Vice President			
Accuracy Based Salary Incentive				
Error Levels (In Percent)	SKU-One Week	8		
	SKU-One Month	29		
	SKU-One Quarter	16		
	SKU-One Year	25		
	Cat-One Month	17		
	Cat-One Quarter	11		
	Cat-One Year	13		
	Firm-One Month	15		
	Firm-One Quarter	14		
	Firm-One Year	13		
Organizational Support				
Support of Upper Management	Highly			
	Somewhat			
	No Need			
Separate budget				
Separate systems				
Forecasting Systems	i2 Technology			
	Manugistics			
	Oracle			
	SAP			
	Other	JDA		
Separate software				
Forecasting Software	Spreadsheet			
	Forecasting			
Use of internal consultants				
Use of external consultants				

Exhibit A.21 (Continued): Damas Ltd Within-Case Summary

Appendix B

Offered Benchmark Forecasting Process



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