Working Paper: 0008

STRATEGIC COMMUNICATION

THE IMPACT OF THE CASINO INDUSTRY ON THE ECONOMY OF SOUTH AFRICA

A STRATEGIC ANALYSIS OF THE CASINO INDUSTRY AND CASINO MYKONOS

AN ETHICAL DILEMMA IN THE CASINO INDUSTRY

OPTIMISATION OF PROFIT BY EVALUTION OF MIX OF SLOT MACHINES & OPTIMISATION OF CUSTOMER SERVICE BY EVALUATION OF QUEUING AT CASH DESKS

A Working Paper

by A Bezuidenhout, University of Stellenbosch Business School

2007

ACKNOWLEDGEMENT

One of the most arduous tasks faced by any MBA student is the writing of home assignments. An MBA student of the USB, Annelise Bezuidenhout, decided to focus her major home assignments on the industry and particular organisation that she is involved in, namely the Casino/Hotel Industry and Casino Mykonos. These assignments embraced the fields of Operations Research (a group project completed in 2005), Business Ethics and Corporate Governance (2006), Economics for Managers (2006), Strategic Communication (2007) and Strategic Management (2007). She received distinctions for all of them. These assignments constitute a thought provoking collection of evidence about an often misunderstood and even derided sector of business and may consequently serve as a basis for discussion and debate, rather than as a conclusive and authoritative text on the subject.

For this reason, which fits in perfectly with the broad aim of a Working Paper Series, it was decided to publish the home assignments. Not only for other interested readers but also to encourage future MBA students to develop their own compilation of relevant and integrated home assignments during their MBA years.

Annelise won the prize for Strategic Management, best in class, 2006. She also had the best overall academic performance of all students completing their MBA during 2006. For this the USB sponsors her participation on the USB Academic Tour to European Business Schools in July 2007.

We wish to thank Annelise for making her home assignments available and our best wishes accompany her in her future career.

Prof Hein Oosthuizen
Head: Doctoral Programmes

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EXECUTIVE SUMMARY

This report is an in-depth analysis of the external and internal environment of Casino Mykonos to identify the major communication issues that prevail at the casino and that need immediate attention. This analysis indicates that attention must be given to advertising, as it is one of the industry's key success factors.

A stakeholder analysis was also done determine on whom to focus the company's communication. The major stakeholders are employees and the clients.

Because no communication strategy is currently in place, attention will also be given to communication aimed at change management, handling a crisis and communicating with the media.

Different alternative solutions were generated to solve the issues and after the solutions had been evaluated, the best solutions were used to draw up a proper communication strategy. An appropriate action plan will be set out to ensure the proper implementation of the communication strategy.

LIST OF APPENDICES

1. BACKGROUND

Gambling has always been part of the South African society, though it was illegal under the Apartheids regime, as proclaimed by the Gambling Act No. 55 of 1965 which consolidated earlier restrictions dating as far back as 1673, with the exception of betting on horse races (NGB, 2005-5: 8). Up to 1994 South Africans did gamble, either illegally inside South Africa or legally in the neighbouring homelands of Bophuthatswana, Venda, Transkei and Ciskei. This resulted in a great deal of potential taxable revenue slipping through the government's fingers.

When the new government took over in 1994, they realised the potential gain in government revenue via taxes in legalising gambling in South Africa, but they also had to overcome the dilemma of profitable existing casinos in the homelands that were to become part of the Republic of South Africa.

Gambling in South Africa is currently regulated by the National Gambling Act No. 33 of 1996 and it states that a maximum of 40 casino licences may be granted throughout the Republic, allocating a certain number to each of the nine provinces. Currently 33 licences have been issued, of which 32 casinos are CASA affiliated (see Appendix A). The exception is the Desert Palace Casino in Upington. The CASA affiliated casinos are part of the Tsogo Sun, Century Casinos, Peermont Global, London Club, Tusk Resorts, CAI Gold Reef and Sun International conglomerates.

Casino Mykonos is a member of the Gold Reef City Casino Group and is situated on the West Coast near Langebaan, amidst the Greek Island resort of Club Mykonos. As it is located on the premises of the holiday resort, the Casino is a favourite pastime opportunity for holidaymakers, especially at night, due to a lack of evening entertainment on the West Coast. Its location on the premises of Club Mykonos provides a perfect opportunity for big gamblers or punters to visit the Casino with the added benefit of overnight accommodation. The location, however, is also a drawback because it is so secluded.

The West Coast community is a poor fishing community and, notwithstanding scarce financial resources, the hope of big winnings lures many local folk to the Casino. The big gamblers, however, are from out of town as well as from overseas and thus the Casino needs to cater for a vast range of punters and their individual needs. There are approximately 6 000 loyalty card members.

The casino is also one of the major employment providers on the West Coast and creates jobs for approximately 180 employees.

2. COMMUNICATION AT CASINO MYKONOS

2.1 Analysis of the environment

2.1.1 Analysis of the external environment

2.1.1.1 Macro analysis

Political / Legislative: It is a highly regulated industry as every casino needs to comply with the rules of the provincial Gaming and Racing Board. The rules and regulations are mainly there to protect punters against themselves, as well as against casinos with devious operations. Legislation also curbs competition, with the maximum number of casinos set at 40. This limitation, in a certain sense, protects the casino industry against the threat of unlimited new entrants.

Economic: Currently the casino industry is one of the fastest growing industries in South Africa, with an exceptionally high growth rate and profit potential. These factors normally attract competitors, but legislation is a big barrier to entry.

Social: Currently gambling is becoming more and more socially acceptable as a pastime activity and that ensures the tremendous growth in the industry.

Technological: Technology is always changing and to satisfy the needs of punters, the industry needs to keep up with the most recent technology not only to provide technologically advanced slot machines, but also to have the best systems available to administer their loyalty programmes and financial information.

Environmental: The industry has a major impact on the other industries in the vicinity, especially on other entertainment providers, which need to share the revenue pie with them.

2.1.1.2 Industry analysis

a. Definition

The casino industry can be classified as part of the entertainment industry, providing gambling entertainment to thousands who hope that lady luck will swing her magic wand in their favour. Casinos, therefore, compete with other entertainment providers for a share in people's disposable income.

Casinos need to bring themselves to the attention of potential customers and also need to improve their reputation to ensure that they attract customers. Positive but luring advertising is thus essential.

b. Characteristics

The turnover generated by the 32 casinos in South Africa amounted to R126 billion during 2005 (NGB, 2005). This emerging market is still in its growth phase but nearing maturity when profits will stagnate (Casa, 2005).

Currently the 32 casinos compete in the nine different provinces, with the two biggest competitors being Gauteng and the Western Cape with a stake of 68% and 9% respectively in the total gaming revenue. Casino Mykonos only has a 5% market share in the revenue generated in the Western Cape. The industry is protected by legislation limiting the number of competitors to 40.

New technology affects the industry as a whole, especially regarding the changes in slot machines. During the past decade, slot machines changed from one armed bandits to touch screens and moneyless machines. Casinos need to keep up with this new technology, at great cost, to retain and attract their customers. Customers are attracted by differentiated services that enhance their experience when gambling.

Casinos need to train their staff in this new technology and inform their customers about the range of services they provide in order to attract them.

c. Future driving forces

The internet and globalisation are important driving forces of the future. Having gambling facilities online can create a competitive edge over other competitors as this will enable gamblers everywhere to gamble any time.

Casinos need to design their websites in such a way that gamblers will be attracted to visit the site and will feel safe to flash their credit cards over the internet to place bets.

d. Competitive analysis

According to Porter's analysis of the combined competitive forces, it is clear that these forces are very strong.

The supplier forces are strong, not only because of high switching costs, but also because there are few suppliers of gambling equipment in South Africa. Not only do suppliers need to import the equipment from overseas, but they also need to be approved as suppliers by the Gaming and Racing Boards.

Substitutes are not only other gambling activities like horse racing or the lotto, but also other forms of entertainment on which the public spend approximately 3% of their disposable household income (Rataemane & Ligthelm, 2003: 7, 10). Thus the force of substitutes is strong due to low switching costs and the availability of other well priced entertainment activities.

Customers' power is also strong due to low switching costs and the possibility to postpone their spending.

The force of new entrants, however, is weak due to legislation limiting the number of casinos per province, the high capital expenditure needed for the erection of the infrastructure and the cost involved in the bid procedures to obtain a licence to open a casino.

Rivalry among casinos is fierce due to the low switching costs for gamblers and the attraction of the different promotional stunts performed by the marketing departments of the different groups.

Due to the strong competitive forces in the industry, the marketing departments need to pull out all the stops to attract punters.

e. Competitive strength

According to the strategic group map, which compares the number of visitors with the revenues earned per province, the Western Cape has the second largest competitive strength position (see Appendix D). Casino Mykonos, however, only has a 5% share of the Western Cape gambling market.

f. Key success factors

The factors that will affect the ability of industry members to prosper in the future are the incorporation of technologically advanced equipment to meet punters' needs as well as financial strength to provide this expensive equipment.

Location is also very important, because casinos need to be within reach of gamblers to be able to attract them. With the exception of loyalty card holders, most casual punters have no specific preference about where they gamble.

Advertising and promotions are crucial in attracting customers and therefore various mediums must be used to ensure that the message reaches all potential punters, loyalty card members as well as casual punters.

Customer service is of the utmost importance to ensure loyalty amongst punters. Loyalty can be enhanced by loyalty programmes for frequent gamblers, which enable them to obtain bonus points according to the amount of money they play and giving them claims to all sorts of prizes and entrance tickets to lucky draws.

2.1.2 Analysis of the internal environment of Casino Mykonos

2.1.2.1 Current strategy and performance

The current generic strategy followed by Casino Mykonos is one of broad differentiation, catering for a broad range of punters. The range of services includes not only different card games like poker, pontoon, and black jack on the tables, but also roulette and different slot machine games with different denomination bets. They outsourced all non-core activities and operate in a high growth, but maturing market.

The current strategy is working very well and their financial performance is indicative of the success. Their budgeted net profit for the past three years was exceeded on average by 10%.

2.1.2.2 Value chain activities

The primary activities of the casino include efficient and automated operations run by integrated computer systems. Market research is important to determine the most effective promotions and mediums of advertising. Customer service is an important factor to create loyalty amongst punters.

The supportive activities include technological developments and experienced staff to assist in capitalizing the benefits of the technology. It also includes the infrastructure to ensure that the administration complies with the Gaming Board regulations. The human resource activities ensure a qualified and motivated workforce. Procurement is restricted to authorised sources, preferably local BEE suppliers. That makes bargaining for the lowest prices difficult, especially on the West Coast.

Their competencies include efficient operations, infrastructure and marketing.

The core competencies are the efficient operations and infrastructure to support the operations.

The distinctive competency is the efficient operations that enhance the punters' experience while gambling. This, together with the personal touch that is possible at the casino due to the fact that it is a rather small casino, gives Casino Mykonos a competitive edge.

2.1.2.3 SWOT analysis

The external threats to Casino Mykonos include the everchanging technology, punter demographics and stiff competition from casinos close by like Grand West, Caledon and Worcester. The opportunities are the still growing market, the possibility to increase market share and the possibilities of online gambling.

Their internal strengths comprise of a skilful workforce, financial strength, efficient operations and a personal touch. The weaknesses include the location and brand loyalty.

The strengths of a skilled workforce and financial strength can be used to counter the threat of technological changes, while the efficient operations and personal touch can set off the threat of stiff competition as well as the weakness of brand loyalty. These strengths can also be used to capture the opportunities of the growing market and online gambling. The stiff competition may increase, if brand loyalty does not increase.

2.1.2.4 Competitive strength analysis

Casino Mykonos has a relatively strong position in the competitive arena, but not as strong as Grand West which has the largest market share in the Western Cape and is also the competitor closest to Casino Mykonos (see Appendix E). Because Casino Mykonos cannot change its location, it needs to attract customers with exceptional customer service, technologically advanced equipment and excellent advertising and promotions.

2.2 Stakeholder analysis

The key stakeholders who were identified are the Western Cape Gambling and Racing Board, the employees, the punters and the shareholders and board of directors (see Appendix B and C).

The Western Cape Gambling and Racing Board has a high interest in the casino. This is not only because they are the regulatory body that lays down the rules and regulations to which all casinos in the Western Cape must comply with, but also because their main source of income is the levies they collect from the casinos. The levies amount to between 3 to 17% of the gross gambling revenue generated by casinos on a monthly basis. Accurate financial information, therefore, must be provided to them on a monthly basis. They also have very high power because they need to ensure that all casinos comply with their regulations to safeguard the public against irregular gambling practices. It is, therefore, of the utmost importance for casinos to communicate all non-conformances immediately to the Gambling Board to avoid fines later on. The Gambling Board conducts regular

audits on casinos and if non-compliances are detected during the audits, casinos can be heavily fined or even be closed down. Communication at Casino Mykonos with the Gambling Board is of a very high standard due to ample communication procedures which are in place to ensure that the Gambling Board stays abreast with everything that happens at the casino. Whenever non-compliances occur, the Gambling Board is notified immediately. They also receive the necessary financial information and payment of the gaming levies within seven working days after month end.

Employees are also key stakeholders. They have a major interest in the well-being of the casino, because their salaries are their main source of income. They also have very high power because the casino industry is a service industry and customer service is one of the key industry success factors. Employees at Casino Mykonos, however, feel disgruntled because the communication between employees and management is not to their satisfaction. They seldom receive feedback and do not feel part of solutions to problems. They feel that they can make a valuable contribution to solving problems, as they work on the floor with the punters and know their needs. This communication aspect needs immediate attention.

Punters, whether they are loyalty card members or mere casual punters, are the main source of income and therefore their needs are very important to the success of the casino. Their interest in the casino may not be very high, because it is just a mere entertainment activity to them. The casino on the contrary has a high interest in them, because of their high power. Punters are the sole source of revenue to the casino and it is therefore of utmost importance to determine their needs and preferences. To attract punters, they must be informed of the range of activities the casino supplies as well as of the different promotions offered. Though this aspect does receive attention, no clear strategy exists and it is doubtful whether the attempts are successful, therefore attention must be given to communication with punters.

The board of directors and shareholders are also key stakeholders. Their interest stems from the investment they made in the casino and the returns they expect to render from the investment. The power of the board of directors is high because they are the main strategy makers of the casino. They expect timely and accurate monthly and daily financial information from the financial department. This information, as well as any other information needed, is usually supplied promptly.

2.3 Major communication issues

The above analysis shows that the major communication issue which needs immediate attention is communication to punters and employees. The focus must be to ensure a two-way symmetrical communication process which benefits the casino as well as the other party and not just merely a oneway information giving process without feedback.

There is a lack of a proper communication strategy and therefore attention will also be given to crisis and change management communication in constructing a strategy.

There has always been a stigma connected to gambling and therefore casinos need to be transparent about their activities. They frequently need to defend their operations against criticism from communities and allegations in the media. Communication to the media will also be addressed in the communication strategy.

2.4 Generation and evaluation of alternative solutions

Communication with punters:

It is very important to determine the likes and dislikes of punters in order to be able to choose the right medium of advertising and the right type of promotions that will attract them and which will ensure that they will pay regular visits to the casino. Currently the casino only makes use of radio and newspaper advertisements with

questionable success. Promotions must be analysed, because it is clear that punters are more interested in cash prizes than in overseas trips or cars (they normally exchange these prize for cash). This is an indication that the promotions do not fulfil the punters' expectations.

The casino makes use of the SGM system that includes a CRM component which can track information regarding loyalty card members. This system, however, is not fully deployed and thus needs to be used efficiently to obtain the beneficial information it can supply. This can enable the casino not only to reach loyalty members via the normal newspaper and radio advertisements, but also via e-mail and sms messages.

It is also important to obtain information about casual punters, because if it is taken into account that there are merely 6 000 loyalty card members, but that the monthly number of visitors can be as high as 80 000, the casual punters contribute to the revenues to a large extent. The possibility exists to use the gaming staff randomly to obtain information about punters' preferences regarding promotions and a possible medium to reach them, with information about jackpots and promotions through questionnaires. However, this can also irritate these casual punters and instead of attracting them, chase them away.

Another way of obtaining information from casual punters is to link the answering of a questionnaire to a competition and thus give the punters the choice to participate.

Chances are good that the casino is going to change to a cashless system in the near future and that all punters, even casual ones, will be playing with cards. This will increase the possibility of obtaining information and of using the CRM system.

The best method to obtain information about punters' preferences regarding the type of promotions and the medium of being informed, is for loyalty members via the CRM system. Currently information about casual punters can be obtained by running regular lucky draw competitions for those who complete the questionnaire. When the casino changes to a cashless card system, the CRM system can be fully used to obtain the necessary information about all punters.

Communication with employees:

Management needs to change their attitude towards communication with staff members. Currently they just inform them of management's decisions without explanations or reasons for changes and thus obtain no buy-in from staff. They need to realise that the staff working with the punters may have solutions to problems they need to solve. Management can therefore benefit from the staff's knowledge by incorporating them in problem solving, rather than attempting to solve all problems on their own. This will not only enable them to generate more solutions, but will also motivate the staff by showing that their input is valuable and will make them feel part of the solutions. Obtaining the buy–in from staff will ensure that when changes are needed, they will adapt more easily.

This can be accomplished by creating work group forums at which employees can make contributions to the solution of problems. Regular staff meetings can be used to inform staff about decisions and explain the reasons for such decisions, but can also offer them the opportunity to ask questions to clarify uncertainties. Currently no work group forums exist and staff meetings are infrequent one-way information sessions at which staff members are informed about decisions without giving reasons for decisions.

Staff also need to get frequent feedback about their performance, especially positive feedback, because negative feedback is supplied frequently when they do something wrong. Managers also need to supply guidance and corrective measures to ensure that mistakes will be avoided in future. That seldom happens and that makes staff feel insecure. Performance appraisals are done once a year and often come as surprise to staff members who find out that they have erred and have not performed according to expectation the whole year long without being

informed of what they could have done better or differently to improve their performance. Management does not communicate with staff members and does not keep them informed. This not only creates uncertainty amongst the staff, but also creates a perception among them that management is incompetent.

Management needs to communicate on a frequent basis with their department members not only to inform them about departmental issues, but also to obtain their input to generate solutions. Head of departments need to give frequent feedback to their departmental staff members on a one to one basis about their performance and should assist them in rectifying any erroneous actions prior to performance appraisals.

The alternative is to continue in the same way as present, but that will contribute to the demotivation of the employees and should therefore be rectified.

Crisis communication:

A strategy needs to be employed to ensure that the correct communication will take place if a crisis may arise. This will avoid potential damage to the reputation of the company and thus a loss of customers. A crisis is fertile ground for investigative media reporting and therefore communication is needed before the crisis situation reaches a point where it is difficult to influence perceptions of the public. During a crisis, employees need to be included in all risk scenarios and the truth must be disclosed to them before statements are made to the media. The communication must not only address the cognitive needs, but also the emotional needs of all the stakeholders. After a risk assessment has been done, the company needs to communicate immediately with the media and all stakeholders. Casino Mykonos is a small company and does not have a public relations department and therefore the general manager will be the one and only spokesperson in times of a crisis. It is important that he will be available to the media at a certain time and place. He needs to answer the basic questions of what happened, why it happened and what the company will do about it. There must be a strategy in place to demonstrate regret and corrective steps. The statement must include an assurance that everything possible is being done to contain the damage and minimise the effects. At the stage when all the facts are not known, only known relevant details must be supplied as well as an assurance that a preliminary investigation is underway at (Webner, 2006).

An alternative is to ignore the crisis and hope that the media will not come to know about it. If they do, only then try to put out the fire. This is a very dangerous approach and can cause the company to destroy its reputation totally.

Change management communication:

Major technological changes are expected in the casino industry of the future and therefore a strategy for communication during the management of change is needed to ensure a smooth transition. An integrative approach, combining a top-down, bottom-up approach will be appropriate to ensure that all employees are engaged and will give their inputs. Resistance is a natural reaction to change, but it can be minimised by obtaining employees' buy-in. The communication can then be planned according to the results of a contextual and audience analysis (Campitt, 2005: 205 – 233).

Because change is difficult and people fear and resist it, communication can ease the pain of change and therefore change management should focus on improving human relations (Grobler, 2003).

If no strategy is in place, the company can hope for the best and let employees suffer through the changes and come out stronger on the other side. This, however, will definitely destroy their loyalty.

Communication with the media:

The media has the power to build or demolish a reputation, therefore a strategy for communicating with the media is very important in order to ensure good relations with them. It is very important that the corporate image, the public's perception, resembles the corporate identity / self-perception, as close as possible (see Appendix F). Corporate communication must be truthful and honest and, therefore, ethics is part of the equation (Webner, 2006). A strong reputation can create benefits like a competitive advantage, enhance bottom-line performance, build strong relationships, signal quality, open up new markets, create loyal customers and attract the best skills and investments. There exists a reinforcing loop of a good reputation that results in good operating performance and that again results in a good reputation. A large reservoir of goodwill can cushion a company in a crisis (Fomburn and Van Riel, 2004). Leaders' own personalities help shape the personality of the company and when a personal reputation is impaired, it can have dire consequences for the reputation of the company (Argenti and Druckenmiller, 2004). Gray and Balmer (1998) states that communication is the aggregated messages from both formal and informal sources and that both secondary and tertiary interpersonal communication may influence the company's image and reputation. Even one subsidiary can influence the reputation of the whole group. This implies that all stakeholders must be aware that they influence the reputation of the company directly or indirectly with communication about the company and therefore whatever is communicated can either build or tarnish the reputation of the company. It is, therefore, of the utmost importance that especially leaders, but also employees, share the values and beliefs of the company culture. The down side risk of media attention is usually greater than the upside potential and therefore communication with the media is crucial.

2.5 Recommendations: Communication strategy

2.5.1 General views on a communication strategy

Communication is essential to the successful achievement of business objectives and therefore it must be aligned with the company's strategy and be part of the management process to have an impact on behaviour (Webner, 2006). No strategy can be implemented without proper communication of the strategy to the employees. According to Argenti, Howell and Beck (2005) communication contributes directly to corporate strategy implementation and is integral not only to the implementation, but also to the formulation. Corporate strategy drives communication choices and communication adds to the process of translating strategy to execution.

A communication strategy can be defined as the macro level communication choices made, based on the goals of the organisation and the judgements about others' reactions, which serve as a basis for action. It involves implicit or explicit choices about what to talk about and what not, to focus on what is deemed important. It is therefore, necessary to set goals to keep everyone informed about choices regarding what must be communicated, the amount of detail, what medium will be the best and how often to communicate. It also involves the anticipation of others' reactions and the necessary adjustments needed to create a dialogue. This can include education, co-ordination, inspiring, relating and informing (Campitt, 2005: 263 - 265). The choice of communication channels is of the utmost importance when compiling a strategy.

According to Baker and Angelopulo (2006), integrated communication is the cross-functional process of creating and nourishing strategically determined relationships with stakeholders by controlling or influencing all messages to these groups when engaging in purposeful dialogue with them. The need for this integration is due to the external market trends, trends within organisations and societies' demands for organisational integrity. Customers should be the starting point of all decisions and actions. Communication integration contributes powerfully to attaining and maintaining an optimal relationship. The junctures of intervention, namely translating the mission into strategy, implementing the strategy, planning and executing the external communication, delivering a service and forming customers' perceptions about the company, directly determine the company's

communication. Long-term and short-term communication must be co-ordinated and must not send mixed messages.

Duncan and Moriarty (1997) suggest the following specific strategies for marketing integration:

- Relationships need to be created and nourished rather than just make transactions.
- The focus must be on all stakeholders and not just on customers and investors.
- Strategic consistency must be maintained rather than independent messages.
- Interaction must be purposeful rather than being a mass media monologue.
- The mission, rather than just the product, must be marketed.
- Rather use zero based planning than adjusting previous plans and do a proper SWOT analysis.
- Do cross-functional planning and monitoring rather planning independently for every department.
- Create core competencies in general communication expertise rather than mere specialisation and expertise in a specific field.
- Use an integrated agency rather than a traditional agency.
- Build and manage a database to retain customers rather than simply acquiring new customers.

Van Riel (1999) indicates that communication integration can be managed by the following methods:

- Rules and directives of communication practices will ensure standardisation by either using a common house style throughout the organisation, common starting points based on certain values that will form the basis of all communication or by using operational guidelines to implement communication.
- Sequencing where independent input is co-ordinated into a message and deriving maximum dialogue.
- Routines / common practices created through education and training.
- Group problem solving will entail coordination of the communication process.
- Steering committees to oversee communication integration as a whole, via ad hoc meetings and annual or quarterly reviews.

Last, but not least, Kitchen and Schultz (1991) stressed that integrated communication is the underpinning of the internal need to change minds, hearts and behaviours. The goal of integrated communication is to enhance the competitive position and capabilities of a company to secure success. Communication builds a positive two-way relationship between the company and its stakeholders. Integrated communication needs to be managed after a thorough analysis of the stakeholders has been done. Relationships need to be planned, implemented, monitored and adjustments need to be made. This is not a single activity, but a deployment of all the elements of the communication arsenal. It must be a two-way interactive activity aimed at creating mutual benefits and thus it needs to take all stakeholders' interests into account.

Robertson (2005) states that communication can supply job, personal, operational, strategic and upward information. Interpersonal skills needed for competent communication include listening, accuracy, clarifying, emotions, encouraging input, providing feedback, giving instructions and managing conflict.

According to Webner (2006), organisations emerge through communication, are maintained through communication and can change through communication. The climate that needs to prevail for successful communication is a supportive one where communication is spontaneous, open and honest and will thus create

trust amongst parties. A concerned, emphatic way of interacting will encourage participation and give participants a feeling of equality. What people say and do must correspond in order to prevent mixed signals. Communication can be divided into the following types of communication:

Corporate communication:

This kind of communication must be done by specialists, because it will contribute to building a relationship with stakeholders and will manage the company's image and reputation.

Management communication:

Top management needs to communicate with the key stakeholders. Their communication must include strategic issues clarifying the vision, mission and objectives of the company, but will also need to enhance the corporate branding and reputation of the company.

Business communication:

All employees need to use this basic skill quite frequently. It includes report writing, interpersonal skills for the day to day communication with other staff members, meetings, presentations, feedback et cetera.

Marketing communication:

This kind of communication focuses on attracting clients through advertising and promotions to position the company in the market.

The most credible sources when communicating are face-to-face communication, intranet, TV, radio, newspapers, internet and e-mail. A choice must be made between these channels and other less credible channels to ensure the most effective results (Whitworth and Riccomini, 2005).

5.2.2 The communication strategy for Casino Mykonos

The communication strategy must address the different communication issues and be integrated to ensure that the same message is heard. That can only be accomplished through cross-functional co-operation from all the different departments:

The Gambling Board, board of directors and shareholders:

Reporting of financial information to the Gambling Board, the board of directors and shareholders must be on time and must be one hundred percent accurate. Any irregularities must be reported to the Gambling Board immediately to avoid fines.

Communication with punters:

The CRM portion of the SGM system should be developed to include relevant information about loyalty card members. This information must be used to determine the communication medium they prefer to receive messages about promotions running at the casino. The medium to communicate with them can include newspaper or radio advertisements, sms messages or e-mail.

Information about the casual punters must be obtained via voluntary questionnaires linked to lucky draw competitions in order to encourage participation.

An in-depth analysis of the information must be done to determine punters' preferred advertising medium and promotions. This will ensure that the message reaches the maximum number of potential punters and will also enable the marketing department to construct promotions around punters' preferences to ensure that they are attracted to the casino.

Punters must also be given the opportunity to give feedback and vent their frustrations to prevent them from taking matters into their own hands. A complaint postbox at the guest relations desk must be installed for this purpose.

Communication with employees:

Management must communicate the vision, mission, corporate culture and strategy to employees in such a way that they see the benefits for themselves and the company. This will enable employees to know where the company is heading and what role they have to play to ensure that the company reaches its goals. Employees should have opportunities to clarify any uncertainties and they must be kept up to date about the accomplishments of different objectives

A change in the mindset of management is needed to ensure that their style changes from an autocratic style to a participating/co-operating style. Management must undergo training in communication skills to enable them to create trust amongst employees to develop a shared vision and to empower and motivate employees through their communication actions. Communication is an integral part of management and therefore all managers need this skill. Most of them unfortunately do not have the skills. Employees expect consistency in the message and compassion for their needs in the communication from top management. Leaders spend a vast amount of time on communication and must be able to influence others through communication (Webner, 2005).

Work group forums must be established and regular meetings must be scheduled to ensure interaction and the building of a trusting relationship. This will enable better problem solving when problems emerge that need solving, as well as buy-in from staff because they feel part of the process.

Regular feedback sessions must be scheduled by head of departments to discuss and rectify employees' performance. This will ensure excellence and increased organisational performance. Managers must ensure that employees understand what is expected from them, thus what their job responsibilities are and the standards of evaluation. Feedback must be useful, legitimate and must enable employees to rectify their actions (Clampitt, 2005 : 155 – 177). Feedback must never be delayed, must be objective, must empower the recipient to change and must build trust through legitimate praise (Hattersley and McJannet, 1997: 145).

Crisis communication:

After a crisis has occurred, an immediate risk assessment must be done. Employees must be included in all risk scenarios and the truth must be disclosed to them before statements are made to the media. The communication must address the cognitive needs, as well as the emotional needs of all the stakeholders. The company must communicate immediately with the media and all stakeholders. The general manager as the spokesperson, must be available to the media at a certain time and place. He needs to answer the basic questions of what happened, why it happened and what the company will do about it. There must be a strategy in place to demonstrate regret and corrective steps with the assurance that everything possible has been done to contain the damage and minimize the effects. At the stage when all the facts are not known, only known relevant details must be supplied as well as an assurance that a preliminary investigation is underway (Webner, 2006).

Change management communication:

A contextual and audience analysis must be done to plan the communication. An integrative approach, combining a top-down, bottom-up approach must be used to ensure that all employees are engaged, will give their inputs and eventually will buy into the need for change (Campitt, 2005: 205 – 233). This communication must assist in the easing of the pain of change and improving of human relations (Grobler, 2003).

Communication with the media:

Long-term media relations must be developed to protect the company's reputation. When communicating with the media, an expert needs to handle the communication. Because the casino has no public relations offices, the general manager is the best person to communicate with the media. He must be responsive, must communicate honestly, keep to deadlines set by the media and supply the type of information required in the preferred format of the reporter. Meeting regularly with reporters will create goodwill credibility. He must anticipate questions and analyse the media successes and defeats as well as research reporters' styles. This must be an integral part of preparing for interviews. The casino must make use of reporters who cover the casino industry and who will portray the company in a way that will build its image (Argenti and Forman, 2002).

2.6 Implementation plan

2.6.1 General views on implementation

To ensure that the strategy is implemented, goals and objectives must be clearly spelled out and policies and procedures must be in place to ensure that the goals and objectives are reached. Not only are policy and procedures needed, but also timeframes and deadlines for reaching the objectives. It is also very important to evaluate the success of the implementation of the strategy by comparing reality with the set goals and objectives.

According to Campitt (2005: 272 – 275) the execution of a communication strategy requires skill, tenacity and insight. Proper implementation involves the use of:

- Repetition of the same message to ensure that the message will reach the listeners and that they will remember it and act on it. It also assists in breaking through resistance.
- Redundancy, thus replicating the same message but varying the mode of expression to ensure the reinforcement of the message by linking the core message to specific examples.
- Identifying and using opinion leaders to support the message and thereby influencing their followers in a positive way to accept the message.
- Identifying and avoiding thought-terminating clichés where certain labels or phrases can prevent listening because of preconceptions.

2.6.2 Implementation plan for Casino Mykonos

Communication with the Gambling Board, board of directors and shareholders:

Relevant and accurate information must be e-mailed on a daily, monthly and annual basis as requested.

Communication with punters:

The CRM system must be up and running and customised by the end of March 2006.

All relevant information regarding loyalty card members must be captured during the three months preceding the end of March.

A monthly competition must be conducted to obtain information from casual punters.

Information must be updated every six months.

The information must be analysed on a monthly basis and must be used in advertising and promotional decisions.

A feedback post box must be erected next to the GRO desk. Feedback must be analysed on a monthly basis and needed adjustments must be made immediately.

***Communication with employees*:**

A staff meeting must be scheduled every month.

Work group forums must be established and they must meet on a monthly basis.

Heads of departments must have a quarterly face to face meeting with each of their staff members to give them feedback.

Management must attend a communication course during February 2007 to improve their skills in communication.

***Crisis communication*:**

Immediate action must be taken to ensure that as little as possible damage is done to the company's reputation.

When a crisis occurs, a risk assessment must be done and stakeholders and the media must be informed. Immediate action must be taken to contain the damage and rectify the situation.

Change management communication:

Change must be anticipated in advance and preparations for communication must be made.

Ad hoc work groups must be formed as soon as the change is evident.

Communication with the media:

Quarterly meetings with the media must be initiated to build goodwill and a positive relationship.

An analysis of the media successes and defeats must be done and communication must be planned according to the results.

Research about reporters covering the industry must be done to determine which one will portray the casino in the light it wishes to be portrayed.

When the media requests an interview, answers to possible questions must be prepared beforehand.

3. CONCLUSION AND SUMMARY

Having a proper communication strategy will not only ensure that all potential punters are reached, but also that employees feel that they are valued and that they contribute to the success of the company. Employees especially need positive feedback, but sometimes also rectifying feedback to be able to perform to their utmost.

Because no-one can predict a crisis, the casino needs to have a strategy in place which it can turn to in case a crisis emerges. Because change is inevitable, it is necessary to have a change management communication strategy in place. The casino also needs to have a strategy in place when communicating with the media, because this has an important impact on the reputation of the company.

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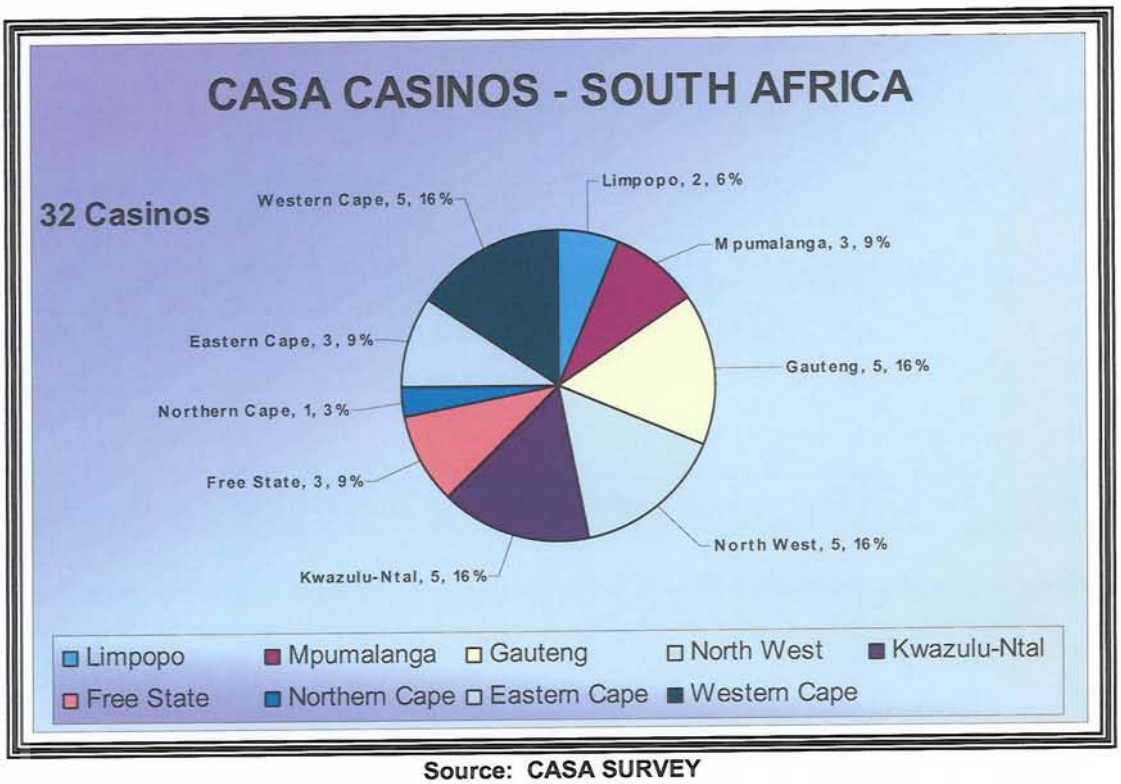
Appendix A: NUMBER OF CASINOS



Source: CASA SURVEY

Appendix B: STAKEHOLDER IDENTIFICATION AND MAPPING

		INTEREST	
		Low	**High**
P O W E R	**Low**	**Minimal effort:** Concessionaires	**Keep informed:** Special interest groups Community Other industries
	High	**Keep satisfied** Service providers Suppliers Media	**Key players** WCG&RB Employees Punters Board of directors & Shareholders

Source: CLASS NOTES

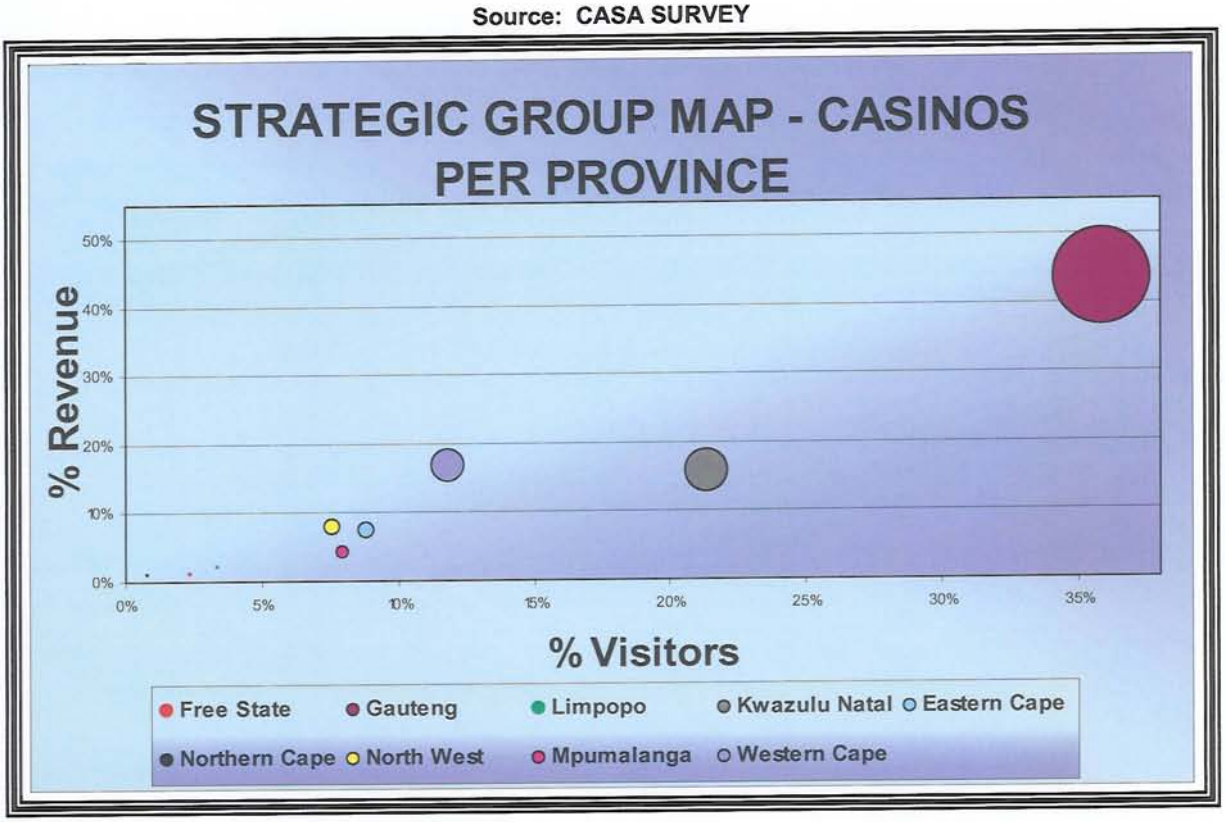
Appendix C: POSITION OF KEY PLAYERS

Stakeholder groups	Needs	Expectations	Issues	General perceptions
WCG&RB	*To be informed about non-compliance to rules. *Timely and accurate reports.	*The casino will comply with the rules. *Timely gaming levy payments.	*Incorrect reporting of revenues.	Casino Mykonos does comply with the rules.
Employees	*To be informed about changes in operations.	*To be part of problem solving and decision making. *To be treated fairly.	* Bad canteen food. *Gap between management and staff. *Remuneration and benefits. *Working conditions.	*Their work is not appreciated. *Management does not set an example.
Punters	*To be informed about promotions. *To be trained regarding card games.	*To have an entertaining time at the casino. *Professional staff to assist them. *To win big.	*Losing money. *Bad service – waiting in queus for their winnings. *Bad service at restaurant.	*Enjoyable to gamble at the casino. *Do not win enough.
Board of directors	*Timely and accurate financial reports. *Daily revenue sms.	*To keep to budget. *To earn exceptional profits.	*Paying out too much as winnings on the tables. *Access expenses.	*Good investment.

Source: CLASS NOTES

Appendix D: STRATEGIC GROUP MAP

Source: CASA SURVEY

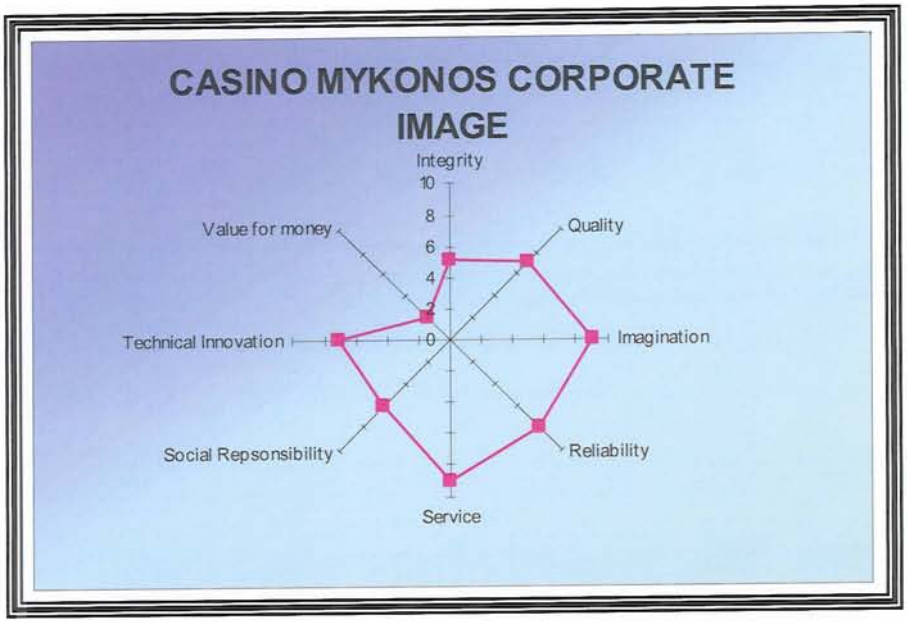


Appendix E: COMPETITIVE STRENGTH ANALYSIS – CASINOS IN THE WESTERN CAPE

IKSF	Weight	Mykonos		Grand West		Caledon		Worcester		Garden Route	
Technology	0.3	7	2.1	8	2.4	6	1.8	6	1.8	7	2.1
Financial Strength	0.2	7	1.4	9	1.8	6	1.2	4	0.8	7	1.4
Location	0.2	7	1.4	10	2.0	5	1.0	4	0.8	8	1.6
Advertising & Promotions	0.2	5	1.0	7	1.4	4	0.8	4	0.8	4	0.8
Customer Service	0.1	8	0.8	5	1.0	6	0.6	6	0.6	7	0.7
TOTAL	1		**6.7**		**8.6**		**5.4**		**4.8**		**6.6**

Source: THOMPSON, STRICKLAND & GAMBLE

Appendix F: CASINO MYKONOS CORPORATE IMAGE



Source: CLASS NOTES

THE IMPACT OF THE CASINO INDUSTRY ON THE ECONOMY OF SOUTH AFRICA

A Working Paper

by A Bezuidenhout, University of Stellenbosch Business School

2007

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EXECUTIVE SUMMARY

The aim of this study is to view the economic impact of the casino industry on its environment and the economy as a whole. In this study the impact on the environment will focus on Casino Mykonos and its impact on the West Coast Community.

The words "casino" or "gambling" usually result in two different opinions: those against it because of their religious beliefs (thus gambling is a sin) or because of the devastating effects gambling can have on the lives of punters when it becomes an addiction. According to the Ecumenical Service for Socio-Economic Transformation the average South African gambler is between 30 and 50 years of age, earns less than R2 500 per month and spends more than 10% of his or her income to win less than R50. One out of seven gamblers borrows money to gamble and one out of four gambles with household money, chasing after the mirage of quick and easy financial security (SACC, 2003: 2).

On the other side of the coin are those in favour of gambling, either because it is their bread and butter (thus employees in the casino industry) or those who enjoy gambling as a way to pass time.

This study does not deny the negative and harmful social effects of gambling on the lives of addictive punters and their families, friends or colleagues (for every problem gambler, up to 12 other people are affected (NGB, 2002: 5)), nor can it ignore the positive impact of the casino industry on the economy and the communities in which it operates. Not only are casinos labour intensive and thus contribute to provide direct and indirect employment, but they also contribute rather largely to the procurement of goods and services with an emphasis on trading with Black Economic Empowered Companies. This, however, is not the only contribution to the economy. When the different levies and taxes that casinos are liable for are taken into account, it is clear that the industry, with annual revenues predicted to be around R6 billion according to the Arthur Anderson report of 1996 (Kyriakidis, Wright, Wallace, 1996: 1) and currently in excess of R8.6 billion, contributes enormously to the economy as a whole, providing large amounts of income to provinces and the country as a whole. Such incomes are in turn utilised to build schools, roads, hospitals et cetera which creates more construction jobs with the multiplier effect of more jobs for all (NGB, 2005: 2).

LIST OF APPENDICES

INTRODUCTION

The definition of gambling according to the NRGP is: An activity where two or more parties place at risk something of value (the stakes) in the hope of winning something of greater value (the prize) where the outcome depends on the outcome of events which are unknown to the participants at the time of the bet (the result). (NRGP, 2003 : 24)

Gambling has always been part of the South African society, though it was illegal under the Apartheids regime as proclaimed by the Gambling Act No. 55 of 1965 which consolidated earlier restrictions dating as far back as 1673, with the exception of betting on horse races (NGP, 2005-5: 8). Up to 1994 South Africans did gamble, either illegally inside South Africa or legally in the neighbouring Homelands of Bophuthatswana, Venda, Transkei and Ciskei. This resulted in a lot of potential taxable revenue slipping through government's fingers.

When the new government took over in 1994, they realised the potential gain in government revenue via taxes in legalising gambling in South Africa, but they also had to overcome the dilemma of profitable existing casinos in the Homelands that were to become part of the Republic of South Africa.

Gambling in South Africa is regulated by the National Gambling Act No. 33 of 1996 and it states that a maximum of 40 casino licences may be granted throughout the Republic, allocating a certain number to each of the nine provinces. Currently 32 licences have been issued, of which 31 casinos are CASA affiliated. The exception is the Desert Palace Casino in Upington (see Appendix I). These casinos are part of the Tsogo Sun, Century Casinos, Peermont Global, Tusk Resorts, CAI Gold Reef and Sun International conglomerates.

The establishment of the National Gambling Board originated from the National Gambling Act and its aim is to standardise practices, promote uniform norms and formulate a national policy regarding gambling in South Africa. A challenge for government policy is to strike a balance between limiting the social cost of problem gambling without reducing the benefits derived from gambling (NGB, 2002: 4 & NGA, 1996: 5). Their mission thus is to protect the society and economy against overstimulation of the latent demand for gambling and to provide for responsible gambling policies. This resulted in the establishment of the National Responsible Gambling Programme.

Casinos generate turnovers in excess of R126 billion per year resulting in gross gambling revenue of 8.6 billion annually. This represents 87.6% of the total gross gambling revenue of all the different types of gambling (NGB, 2005) (see Appendix A & B).

The average profile of casino gamblers is as follows: though the target market of casinos is the middle to high income group, most of the clients are in the low to middle income groups. The average gambler is between the age of 30 and 50 (37.6%) and consists of more men than women. It is evident that unemployed and retired / non-workers show a smaller propensity to gamble than those with a full-time or part-time job and strangely enough, participation tends to increase when the educational level increases. A disturbing 60.8% gamblers earn less than R2 000 per month. White customers are in the majority, with substantial proportions of Indian and Black customers at certain casinos. Most gamblers live in close proximity to the casinos they visit. The average amount spent per visit is about R150, but frequent gamblers tend to spend more. Only 0.1% spend more than R2 000 per month. Those spending between R500 and R1 000 are in the age group between 18 and 40 or over 60, most of them work full time and have primary or secondary education and are men earning more than R2 000 per month. The main reason for people not gambling is either a lack of money or because it is against their religious beliefs. Only 12.2% of the population fall in this category. Most people claim that they will spend their winnings on necessities or will save it, but these two items are also the two on which gambling money would have been spent if not used to gamble (NGB, 2005: 1 & Ligthelm & Mabaso, 2003: 18-50).

DISCUSSION

1.1 THE NEGATIVE EFFECTS OF THE CASINO INDUSTRY ON THE ECONOMY

Gambling is defined as staking something valuable in the hope of winning a prize where the outcome is unknown to the participants (NRGP, 2003: 9).

The gambling industry is often accused of having a negative impact on household welfare due to problem gambling habits. It also has negative consequences on retail sector activities, especially on those in the vicinity of casinos, because of expenditure displacement.

Traditionally compulsive gambling was viewed as a vice caused by moral weakness or lack of self-discipline (NGB, 2005-5: 11). Problematic behaviour can be defined as excessive gambling and failing to control oneself without assistance, thereby causing significant harm to oneself and others. It can manifest itself as part of a personality disorder or may result from ignorance, inexperience or lack of financial management skills, boredom (the most common reason among women), social isolation, depression or even cultural factors. Problem gambling, like alcoholism and other addictions, develops over a rather long period of time. Problem gamblers, like other addicts, demonstrate an obsession with gambling, thinking about it much of the time. They use gambling to escape pain and experience a unique but delusional sense of well-being when they gamble (NRGP, 2003: 10). Unfortunately the incidence of problem gambling is likely to increase over the coming years, because the problem usually becomes visible 2 to 3 years after a person starts to gamble (NRGP, 2003: 20) and currently gambling is becoming more and more socially acceptable. Most patients who require treatment fall in this category.

However, there is also a second category consisting of compulsive and pathological gamblers who have a psychiatric disorder of impulse control. This is a chronic condition similar to alcoholism or manic depression. These gamblers have an inability to control their gambling and are very difficult to treat. Only 1% of gamblers belong to this category (NGB, 2005: 1).

The incidence of problem gambling is similar to problem drinking, though there are fewer problem drinkers than gamblers. However, the incidence of problem gambling amongst regular gamblers is only 6% compared to 9.4% of problem drinkers (NRGP, 2003: 20). Alcohol differs from other stimulating drugs which yield a "high" in that many people drink without wanting to become drunk, whereas the principal point of using other drugs is to become "high". The mixture of hope and danger which gambling offers means that the risk-taking can produce a "high" and become addictive in the way other drugs can (NRGP, 2003 : 30).

Financial loss is the main trigger for problem gamblers and this gives rise to a range of social and personal repercussions (NGB, 2002: 4 & 2005-5, 21 - 24):

1.1.1 Personal

Problem gambling impacts on the personal life of an addict, resulting in symptoms of stress, depression, anxiety, guilt, restlessness, preoccupation with gambling and loss of control. This may lead to ill health and even eventually to suicide as a way out of their gambling problems.

1.1.2 Financial

When gambling becomes a problem, gambling debts may lead to financial instability and punters falling into the hands of loan sharks; assets are used to pay for gambling debts and this may even result in bankruptcy. A major reason for experiencing financial difficulties because of gambling is that gamblers obtain gambling money via abnormal means. This includes the easy availability of credit via credit cards, selling jewelry or other assets, borrowing money or even using household money to indulge the addiction. It becomes a vicious cycle; while

getting deeper into debt, gamblers try harder to resolve the problem by gambling, obtaining money in ways that increase their debt.

The social cost to society includes high insurance premiums due to illegal activities like fraud, embezzlement and white collar crimes, as well as increasing police cost, legal costs and the cost of correctional services that result from problem gambling.

One of the major objections against casinos is the fact that they deprive established local businesses from some of the disposable household income. This results in existing enterprises losing revenue which may eventually lead to job losses and may even cause smaller businesses to close down. This consequence, however, is not only the result of gambling, but was also caused when the cell phone industry boomed.

Research shows that 57.1% of gamblers spend less than R50 per month on gambling, 30.5% spend between R51 and R150 per month and only 0.1% spend more than R2 000 per month (Rataemane & Ligthelm, 2003: 11).

Research done in the United States of America shows that casino revenue is redirected from expenditure on other goods and services, usually from the entertainment industry (in particular other gambling activities). Not only is there a displacement of the money spent on gambling, but also a displacement of time spent on gambling because it prohibits gamblers from pursuing other consumption activities. It has also been established that for every $100 generated in gambling revenue, casinos make $22.7 in direct purchases upstream, not taking the downstream expenditure of salaries and wages of staff into account. Communities usually only benefit from casinos if the revenue generated comes from outside the community. If the revenue originates from locals, it only redistributes expenditure from existing businesses (Ligthelm & Mabaso, 2003: 55-56).

South African research showed that changes in expenditure patterns coincided with the establishment of legal gambling in South Africa. Expenditure on retail goods decreased, while expenditure on services like education, health and communication (via cell phones) increased. It could not be determined which one was responsible for lower expenditure on goods. However, when household expenditure is viewed, gambling falls into a category that represents less than 2% of the total household expenditure. Gambling constitutes 1.27% of the total household expenditure (70% of this pertains to casino gambling) (Ligthelm & Mabaso, 2003: 64-72). This money would have been spent mainly on household necessities (71.3%) and savings (27.3%) (Rataemane & Ligthelm, 2003: 7, 10).

However, when taken into account that casinos are only allowed to retain a maximum of 15% of their gambling turnover, called the hold percentage, they compare favourably to other for profit enterprises where a gross profit percentage of 15% is not out of the ordinary. The only difference is that it is not necessarily the customer paying for the "service" who obtains value (excluding the recreational value) for his or her money.

Taking into account the wine, cell phone, tobacco and other industries which also have negative effects, the positive effects of these industries with their potential negative effects cannot be ignored, as they contribute significantly to the economy.

1.1.3 Legal

Gambling debts may force punters to resolve to theft, fraud and embezzlement and eventually may result in imprisonment. Gambling also often results in a criminal element such as prostitution and drugs being associated with the activity, but so are also a number of other economic activities (NGB, 2005:5).

Illegal operations resulting from the existence of casinos place additional stress on the work load of the police force and other law enforcement entities.

1.1.4 Interpersonal

Not only does problem gambling affect the personal lives of punters, but also the lives of other people around them. Research from other countries indicates that for every problem gambler, up to 12 other people are affected. These people may be family or friends, but also colleagues (NGB, 2002: 5).

Most problem gamblers lead secretive lives that force them to lie to family members about their whereabouts and spending habits and this can cause distrust, families being neglected and domestic violence. These problems related to addiction may even lead to divorce, with a number of interpersonal, legal and financial consequences.

Sometimes children are neglected or even abused and it has been established via research that children of gamblers are more likely to adopt delinquent habits such as smoking, drinking or using drugs. Children of gamblers have a high risk of becoming compulsive gamblers themselves.

1.1.5 Community and social services

These services, aimed at assisting addictive gamblers, place a heavy load on the public purse. Job losses also result in unemployment claims. During 1999, in the USA, it was established that the treatment of pathological gamblers amounts to $1 200 per person, while in the case of problem gamblers it amounts to $750 per person. The lifetime cost (bankruptcy, arrests, imprisonment, legal fees for divorce et cetera) may amount up to $10 550 per pathological gambler and $5 130 per problem gambler (NGB, 2005 : 24).

1.1.6 Work and study

Personal problems tend to lead to poor performance, absenteeism, arriving late and even to job losses, negating the positive effect of direct and indirect job creation. Reasons for poor performance and absenteeism vary from gamblers being too tired to work or being too pre-occupied to concentrate on their work. It has been established that up to one third of problem gamblers lose their jobs or businesses (NGB, 2005 : 23).

An increasing number of students are bitten by the gambling bug and as gambling affects the studies of these students negatively, it not only results in their failing but it also results in money being wasted on unsuccessful students.

1.1.7 Educational

Gambling has a negative effect on children who grow up in a community where gambling is common. This causes them to think that the only way of making money is via gambling. This way of thinking causes a decline in the quality of life (NGB, 2005: 4). Because children of gamblers tend to become problem gamblers, it is essential that those children are educated about the dangers of gambling. The NRGP has a youth programme that they present at schools and which is aimed at warning children about the dangers of problem gambling.

The gambling authorities, recognising the devastating effects of problem gambling, provide assistance to problem gamblers through the National Responsible Gambling Programme. This programme is funded by all casinos via a compulsory contribution of 1% of their annual gross gaming revenue. The programme is free and assists problem gamblers with their addiction. It runs a 0800 toll free helpline and also provides counseling to outpatients, as well as inpatients via treatment programmes. As in the case of alcoholics the treatment is not successful until an addict perceives that he or she has a problem and seeks assistance. 72% of all problem gamblers receiving treatment or counseling are linked to casinos and this may easily result in 50 400 casino gamblers per year. This, however, results in only 0.13% of the total number of visitors who pass through the gates annually (WCGRB, 2005: 11,20 & NRGP, 2004, 13).

In addition to this government-enforced assistance programme of the NRGP, the media continuously give publicity to the dangers of problem gambling and its negative impact. There is also a voluntary organisation, Gamblers Anonymous, which supports rehabilitated gamblers via support group meetings (NGB, 2005-5: 3).

Casinos also provide a self-exclusion facility, in which case a customer can request the casino to treat him or her as if he or she has been banned from the casino. This assists the customer who wishes to stop gambling by making it difficult for him to access gambling opportunities (NGB, 2005: 2). The surveillance of all casino activities on close circuit television is also to identify compulsive behaviour patterns, over and above the ensurance of legal operations by casino staff and gamblers.

At present casinos are rather placing emphasis on providing entertainment for the masses, instead of hooking the big punters.

1.2 THE POSITIVE EFFECTS OF THE CASINO INDUSTRY ON THE ECONOMY

The economic benefits which are the driving force behind legalising casinos, stem from tourism and economic growth that accompany the development of casinos, but only if this business is drawn from non-local residents (NGB, 2005).

The financial impact is three-fold: namely the initial impact of the project during the construction phase, indirect impacts determined from activities of suppliers and the induced impacts due to an increased demand for goods and services by households from the income earned from employment at casinos. The gambling activities in a particular province often spill over to other provinces. It has been established that a GDP multiplier of 3 exists for the gambling sector. This means that for every R100 value-added GDP generated by the casino industry, a further R200 value-added GDP is produced through indirect and induced effects. This high multiplier is ascribed to the relatively high labour remuneration to turnover ratio that exists in this industry, as it is labour intensive to very large degree (Ligthelm & Mabaso, 2003: 95).

All applications to obtain a casino licence are evaluated according to the contribution which is made to the promotion of tourism, sustainable employment generated, provision of training and skills, procurement of labour, goods and services locally purchased during development and operational stages, the extent of ownership and control by disadvantaged groups, benefits and facilities provided for any needy or disadvantaged group and the contribution to the country's Reconstruction and Development Plan (Kyriakidis *et al*, 1996: 4).

1.2.1 Entertainment and tourism

From the consumers' perspective, a major benefit derived from gambling is recreation, because it attracts individuals who obtain pleasure from the venues, the social interaction, the risk of losing money, as well as the thrill of the anticipation of winning. (NGB, 2002: 3).

Recreational gaming from a gambler's point of view provides the following pleasures: playing games, fantasising about winning large sums of money, feeling artificially endangered and being in a stimulating environment (NRGP, 2003: 9).

When taking into account that 38.6 million (NGB, 2005) (see Appendix G) visitors enter the doors of casinos annually, it is safe to say that a vast number of South Africans enjoy visiting casinos, even if they do not gamble at all. Of these visitors a small percentage are serious gamblers who belong to the different loyalty programmes offered by the casinos.

Gambling is a worldwide recreational activity and although it is impossible to determine the number of foreign visitors, it is safe to say when viewing the total amount of foreign currency deposited annually by casinos, that it is a big tourist attraction. Tourism is one of the industries earmarked by GEAR to enhance economic growth, a

positive contribution to the economy to obtain money from abroad. Due to the favourable exchange rate of the rand versus all major currencies, foreign punters find it worth their while to gamble in South African casinos.

1.2.2 Employment

One of the main benefits of the casino industry is job creation, which is desperately needed in South Africa to solve the unemployment problem. The casino industry is currently responsible for employing 12 543 direct employees and 20 377 indirect employees, who are employed by suppliers to whom certain non-core services are outsourced. These services include security, cleaning, food provision, kiddies game shops and other entertainment in and around casinos. The total payroll for direct employees amounts to R1.6 billion (NGB, 2005) (see Appendix F & H).

The total number of new jobs which are created, taking all related enterprises into account, is almost 100 000(CASA, 2005, 1). The employment multiplier was determined to be 3.15 and the employment provided by this sector, direct and indirect, constitutes approximately 2% of the total employment in South Africa. 78% of all employment in the industry is held by previously disadvantaged groups and 52% of the jobs are held by women. An average 6% of the gross gambling revenue is spent on the training and development of casino staff (Ligthelm & Mabaso, 2003: 100).

1.2.3 Procurement

Not only are casinos obliged to buy from Black Economic Empowered enterprises, but they are also obliged to support local businesses. In small communities especially, this has proved to give rise to the development of new businesses to which certain services were outsourced, for example security, cleaning and cash-in-transit services, as well as providers of food and other entertainment.

Some enterprises merely exist because of casinos. As a result of strict regulations laid down by the gaming authorities, enterprises providing core casino services must be licensed by the provincial gaming boards to be able to provide these services. Thus the official providers of casino-related stationery, those maintaining the surveillance, slot machine equipment and computer programmes, mainly exist because of the casinos they service.

1.2.4 Black Economic Empowerment and small and medium enterprise development

On average 60% of the voting control in the casino industry is held by previously disadvantaged individuals who became shareholders in the industry. The industry constitutes a 38% effective economic empowerment (CASA, 2005). 85% of the directors of licensee companies are historically disadvantaged individuals. All directors of management companies also fall in this category (Ligthelm & Mabaso, 203: 110).

Casinos are obliged to procure goods and services from suppliers who were historically disadvantaged and a minimum of 25% of all purchases must comply with this prerequisite.

The procurement policy of casinos gives preference to trading with SMME's for contracts with a value of less than R7.5 million, provided that quality and pricing are competitive and that these small enterprises constitute 64% of all procurement (Ligthelm & Mabaso, 203: 109).

1.2.5 Government revenue

All interested parties who want to obtain a casino licence need to apply, submitting a proposal on how they will benefit the community and paying a bid fee of between R7 and R12 million per application. These bid fees become part of government revenue irrespective of whether the bid is successful or not. Government has thus

obtained a substantial amount in bid fees since 1994, taking into account that more that one company usually place a bid per casino.

Though punters' winnings are tax free, government derives large sums of revenue from casinos. 14% VAT is paid on casino earnings, as well as 30% company tax on net income. This is over and above the personal income tax paid by employees. Provincial casino taxes / levies paid over to the different provincial gaming boards vary between 3 to 17% of gross gambling revenue per month, depending on the amount of gaming revenue. Via gaming taxes government derived R776 million in revenue from the casino industry during 2004/2005 year (NGB, 2005-1) (see Appendix C) and the total contribution to taxes during 2003 amounted in excess of R1.7 billion (CASA, 2005: 1).

1.2.6 Charities

All CASA members are committed corporate citizens and invest substantial sums of money in social programmes (CASA, 2005). Casinos, therefore, need to identify local charities of their choice to which up to 5% of their annual pre tax-revenue is contributed. Taking into account that the total Gross Gambling Revenue per year amounts to R8.6 billion (NGB, 2005) (see Appendix A), it may result in a R39 million contribution to needy organisations or worthwhile causes, ranging from community upliftment, HIV/Aids programmes and culture enhancement (CASA, 2005). This include Christmas hampers to old age homes, contributions to the SA Guide Dog Association, the SPCA, Aids ministry, crèches, the Red Cross, churches, community development trusts, schools, child welfare, the disabled, sports sponsorships, hospitals and others.

1.2.7 Casino-related organisations

The Casino Association of South Africa (CASA) represents the interests of all the legal South African casinos, as well as the public served by the industry. Casinos contribute to this association according to the number of slot machines and table seats they are licensed for.

The National Responsible Gambling Programme assists problem gamblers and 1% of the annual gross gaming revenue is contributed towards this programme by casinos. 1% of the gross gaming revenue results in R87 million per year. A major part of this sum is being utilised to assist problem gamblers, and also to create an awareness among the public (including children) of the dangers of problem gambling.

The Gambling Boards of the different provinces regulate the industry under their authority and set the standards. Casinos need to pay annual licence fees for the casino itself, as well as for every gaming employee, every slot machine and every table.

1.2.8 Investment

The total capital invested in the 25 casinos erected since 1994 amounts to R11.4 billion (CASA, 2005) (see Appendix D), varying between R65 to R1 917 million per casino and has an economic multiplier for local business of 1.3. Thus for every rand spent on the development, an amount of R14.8 billion was contributed to local business (Kyriakidis *et al*, 1996: 1). During the period 1997 to 2000 the contribution to the total fixed investments in South Africa was 2.1% (Ligthelm & Mabaso, 2003: 100).

During the development phase the construction industry creates many jobs, directly as well as indirectly.

Not only is job creation a positive derivative, but the industry also attracts foreign direct investment, much needed to decrease the deficit on the Balance of Payment. One of the largest foreign capital contributors is Hilton International, which has spent in access of R18 million. These international investments will also indirectly boost tourism (NGB, 2005: 2).

1.2.9 Legal

Casinos are a favourite places for drug lords who try to launder their dirty money, but staff are trained in money-laundering techniques. Casinos are usually able to spot illegal transactions via their surveillance rooms and manage to bring the crooks to justice. All casino equipment, slot machines and note counters can spot ink-stained notes and can therefore prevent hijackers of armed vehicles from getting rid of their stained notes via a casino. Casino punters who win more than R5 000 also have to provide all the necessary documentation to comply with the FICA regulations.

1.3 THE CONTRIBUTION MADE BY CASINO MYKONOS TO THE LOCAL COMMUNITY

Casino Mykonos is situated near Langebaan on the West Coast of South Africa, within in the idyllic surroundings of the Greek resort, Club Mykonos. It is one of the smaller casinos with a 5% market share in the casino industry and has been operating since November 2000. There are currently 270 slot machines and 9 tables, giving gamblers the opportunity to play roulette, black jack, poker and pontoon. The casino is part of the Gold Reef City Group with a affiliations in Casino Austria. Notwithstanding the fact that it is a rather small casino, it is very popular because many of punters prefer less "busy", more personal surroundings in which to enjoy themselves. Being small ensures that the staff know regular punters personally and that is very important to most gamblers. All relevant information was obtained from the records, financial and otherwise, of Casino Mykonos.

1.3.1 Tourism and entertainment

More than 700 000 visitors pass through the doors of the casino annually. According to the records supplied by the marketing department, 8 000 of these customers belonging to the Club Olympia loyalty programme and 61% originate from outside the West Coast community. The predominant age varies between 46 and 55 years and most of them are men. This ensures that a large portion of the income is derived from visitors and not the local community. When the total amount of foreign currency banked during the year is taken into account, it is also clear that the casino attracts foreign visitors.

On the negative side, 6 punters had themselves banned from the casino during 2005.

1.3.2 Employment

Direct employment of 174 staff members was created with the erection of the casino and thus the casino is one of the largest employers in this rather poor fishing community. The annual payroll is in excess of R13.3 million.

Indirect employment, due to outsourced services, creates jobs for another 109 employees.

1.3.3 Outsourced services

Staff transport is outsourced to local taxi services and the annual contribution to their revenue amounts to R381 000. The security services (R1.9 million annually) and cleaning services (R332 000 annually) are likewise outsourced. The restaurant which supplies staff canteen meals earns an amount of nearly R1.5 million annually, while purchases made by staff members at the tuck shop amount to R176 000.

1.3.4 Local businesses

Total annual procurement amounts to R88.4 million and more than 50% of this amount is spent on companies situated on the West Coast and in the Western Cape.

To a large extent the resort, Club Mykonos, benefits from the casino and vice versa. Many loyal punters from out of town make use of its facilities to stay over while enjoying their gambling activities and guests, who are not gamblers usually, try their luck while having a holiday.

1.3.5 Charity

5% of the annual net profit before tax is contributed to the West Coast Community Trust which is committed to uplifting the disadvantaged members of the community. This amounted to a sum in excess of R1.5 million during 2005. During 2005 they also donated written-off computer equipment to schools in the vicinity. A number of local fund-raising activities were sponsored as well.

1.3.6 Empowerment

The shareholders and board of directors do not only represent previously disadvantaged groups, but the company also prides itself on doing business with black empowerment companies to the extent of an average percentage of 35%.

1.3.7 Government revenue

With an annual net pre-taxed profit in excess of R23.9 million, the government earns R8.3 million in income tax, R7 million in the form of VAT and R2.5 million via PAYE. Due to the income derived by the casino, a 6% gaming levy, which amounts to R8.8 million per year, is paid over to the Western Cape government.

1.3.8 Casino-related organisations

The contribution to CASA amounts to R65 000, the compulsory 1% of gross gaming revenue to the NRGP amounts to R89 000 and the Western Cape Gaming and Racing board derives an amount in excess of R1.9 million in gaming licence fees of the casino, its employees, slot machines and tables.

1.3.9 Investment

The total capital invested in developing the casino only amounted to R66.3 million rand, making it one of the least expensive casinos in South Africa. It amounts to only 3.4% of the cost of the largest one, Montecasino which amounts to R1.9 billion. Taken into account that the Arthur Anderson report indicated that a 1.3 multiplier can be used to determine the impact on local businesses, the West Coast derived a R86.2 million contribution due to the development of the casino. The erection of the casino has definitely added value to the properties in the vicinity and assists in boosting the property market of the Langebaan region.

CONCLUSION

Though the negative effects of gambling and its impact on the economy cannot be ignored, there are also a number of positive spin offs that cannot be ignored either. It will therefore be wise to attend to the negative effects (the main one being problem gambling that causes most of the negative effects) and try to minimise or prevent them. We need to focus on the positive contributions made by casinos, such as tourism and the generation of government income which enables the redistribution of income to the needy. Most of all it creates much needed additional employment in South Africa.

Gambling, being legalised, is here to stay and we need to make the best of it (reap the benefits and minimise the liabilities): thus adapt or die.

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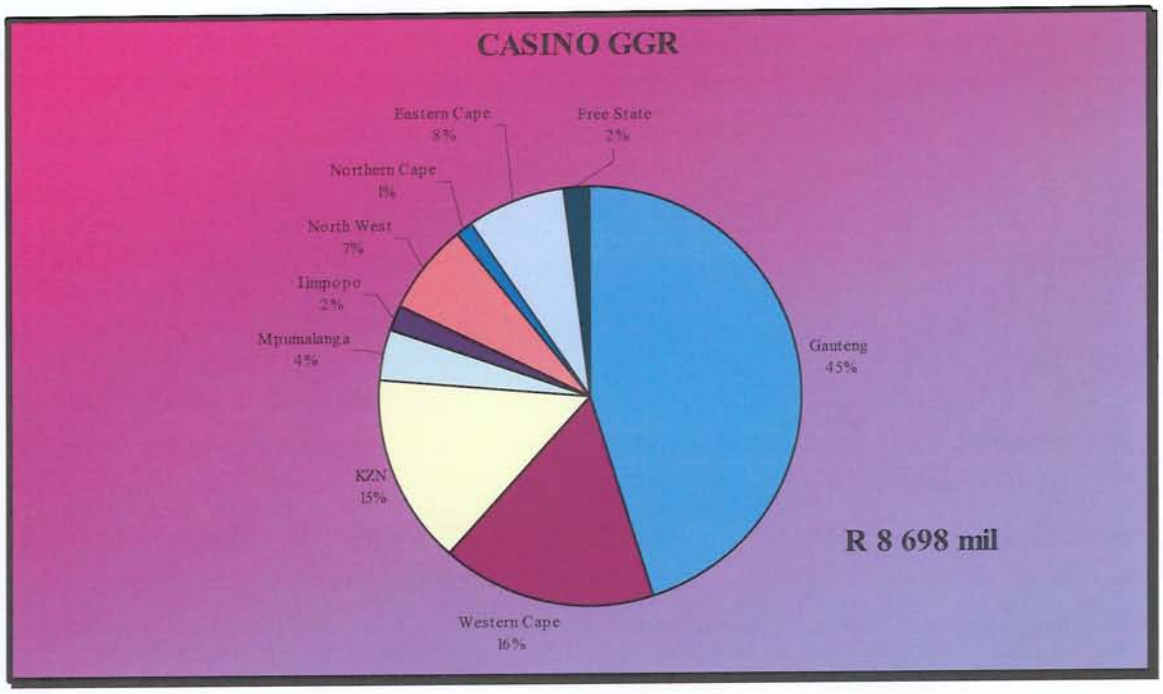
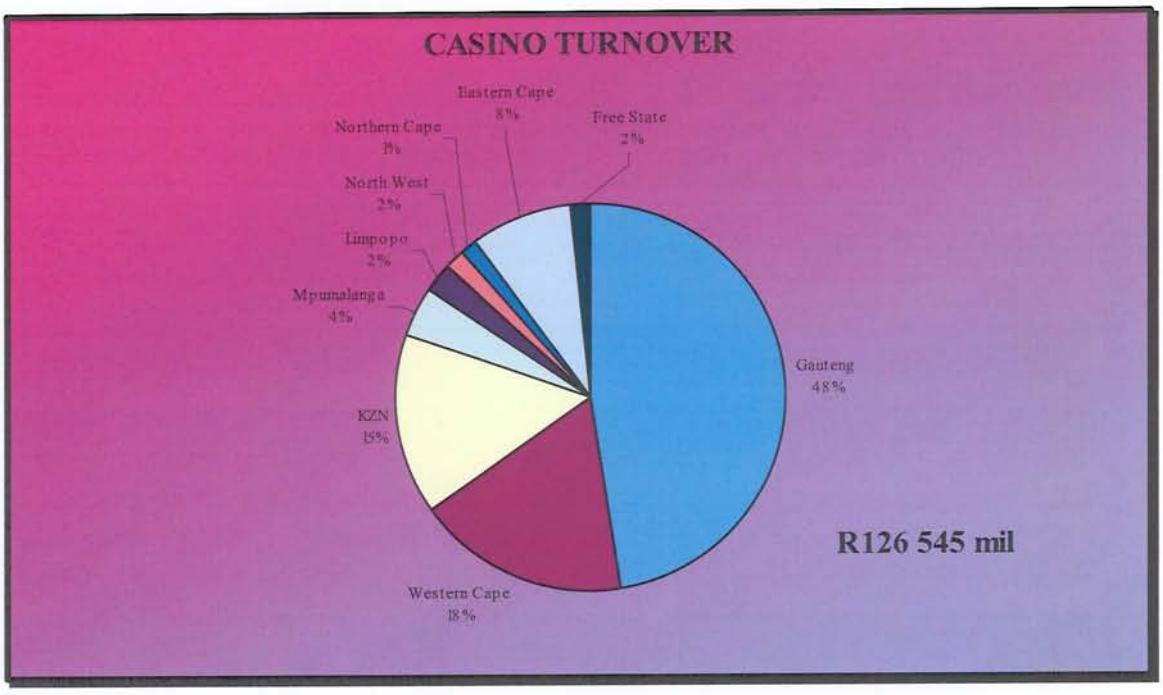
APPENDICES

APPENDIX G: CASINO GROSS REVENUE 2005



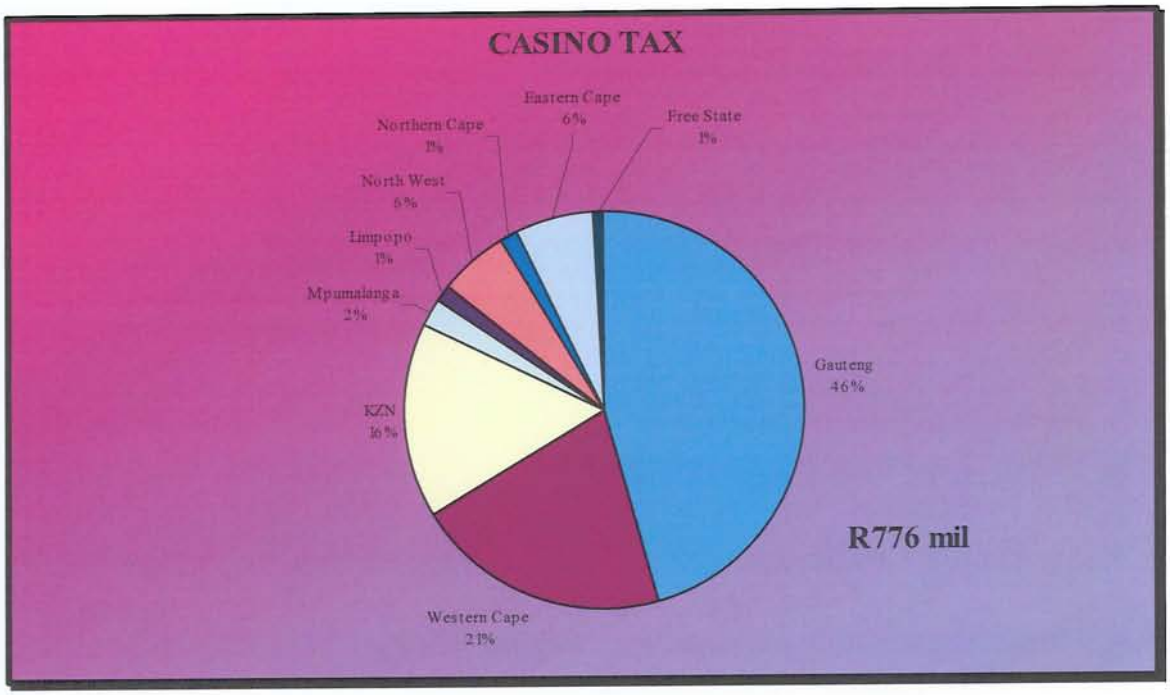
Source: NGB STATISTICS 2005

APPENDIX H: CASINO TURNOVER 2005



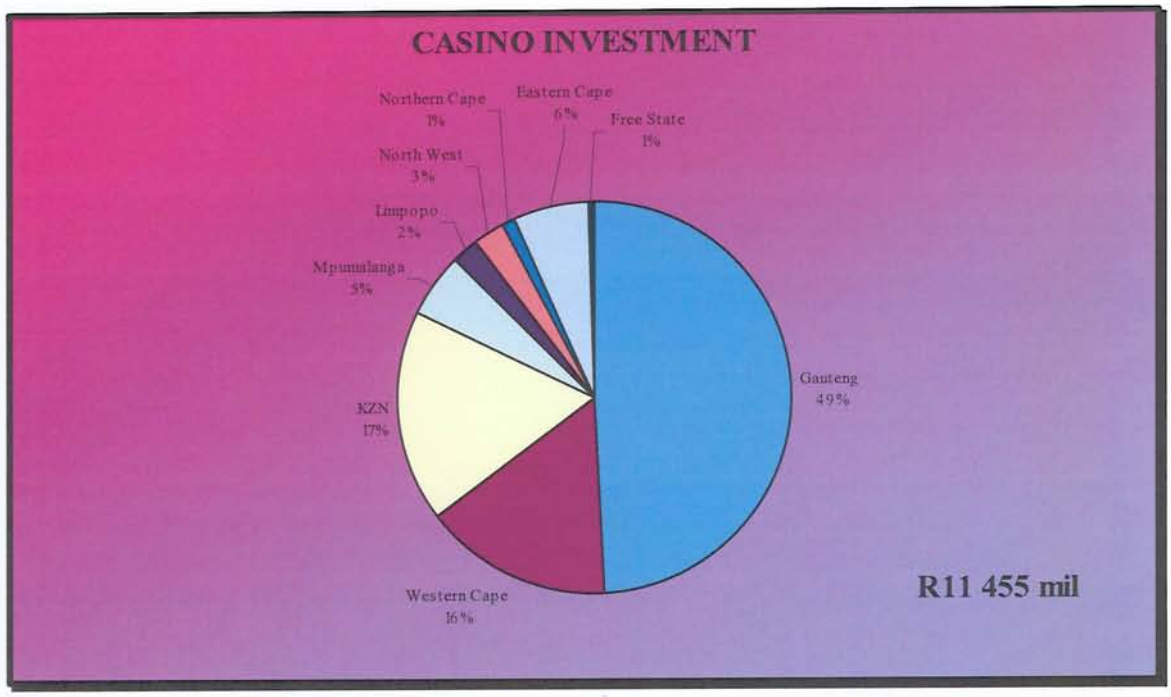
Source: NGB STATISTICS 2005

APPENDIX I: CASINO CONTRIBUTION TO TAX REVENUE 2005



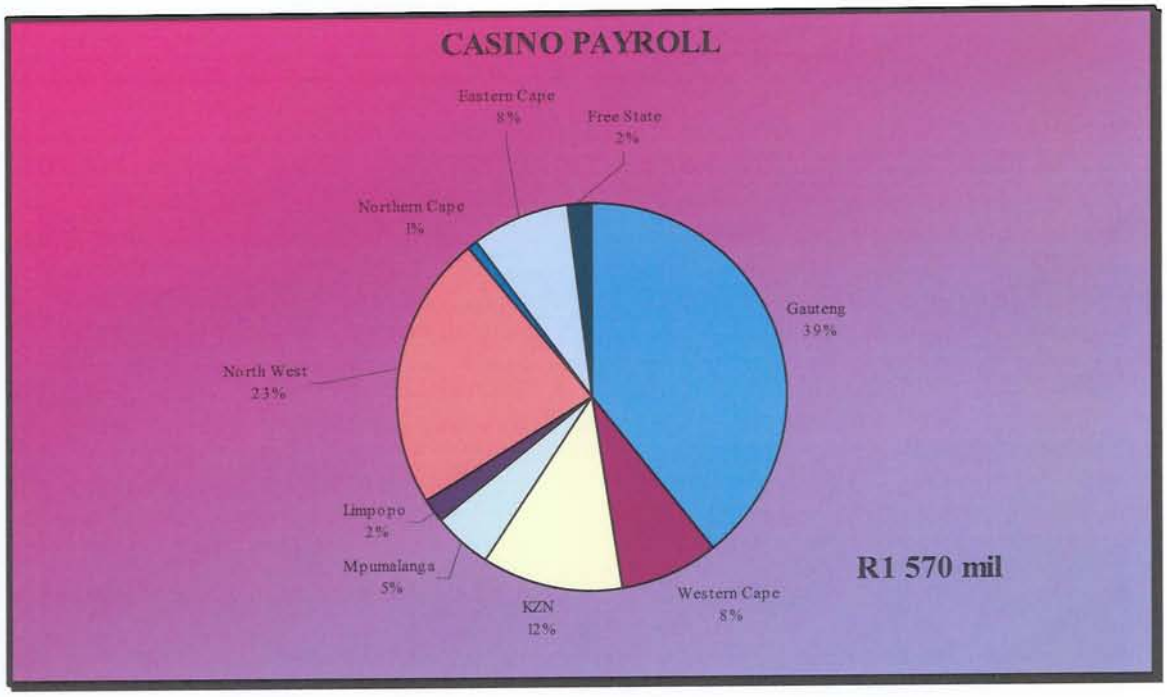
Source: NGB STATISTICS 2005

APPENDIX J: INVESTMENTS IN CASINO DEVELOPMENT



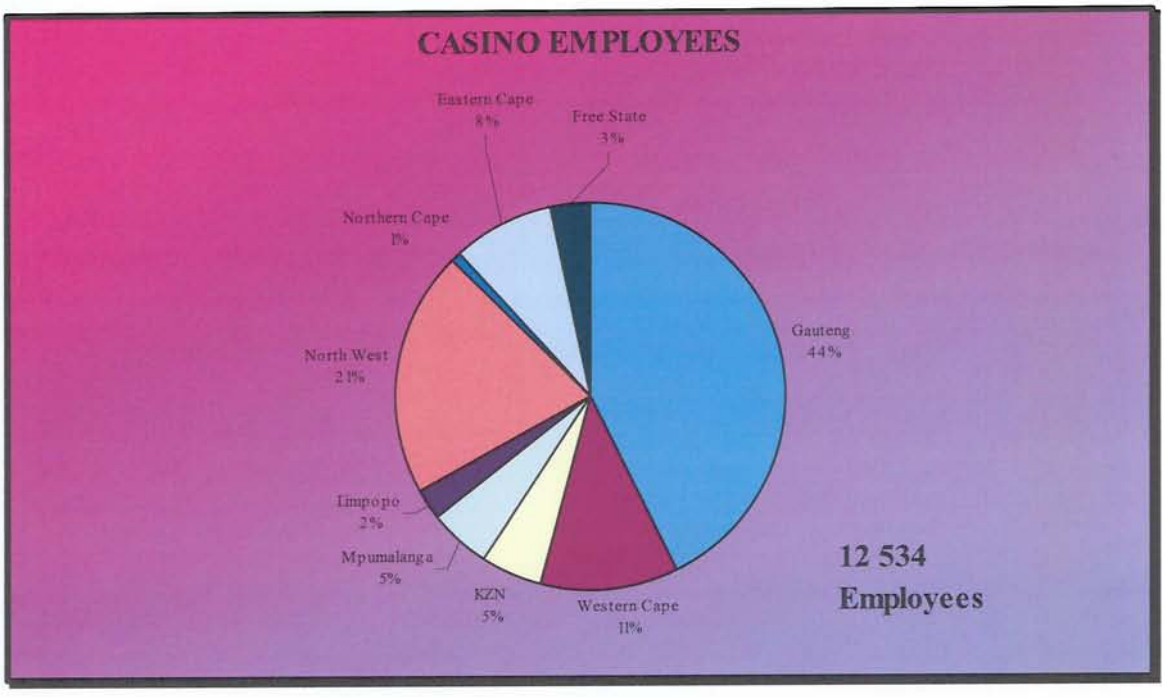
Source: CASA SURVEY

APPENDIX K: CASINO PAYROLL



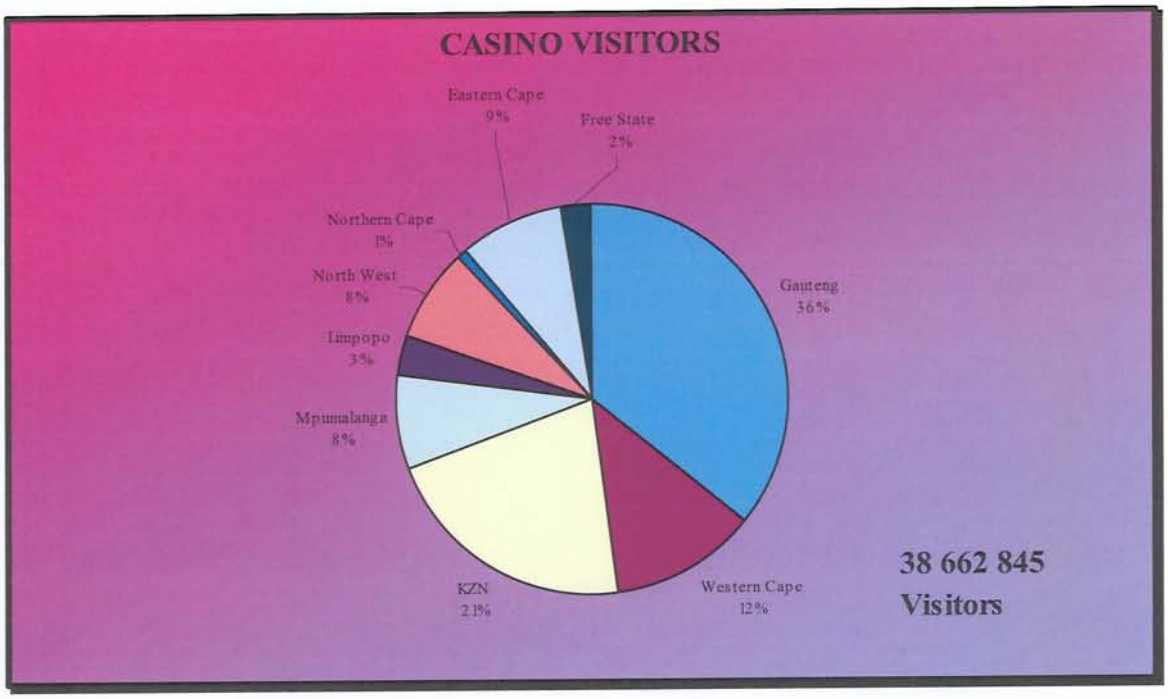
Source: CASA SURVEY

APPENDIX L: NUMBER OF CASINO EMPLOYEES



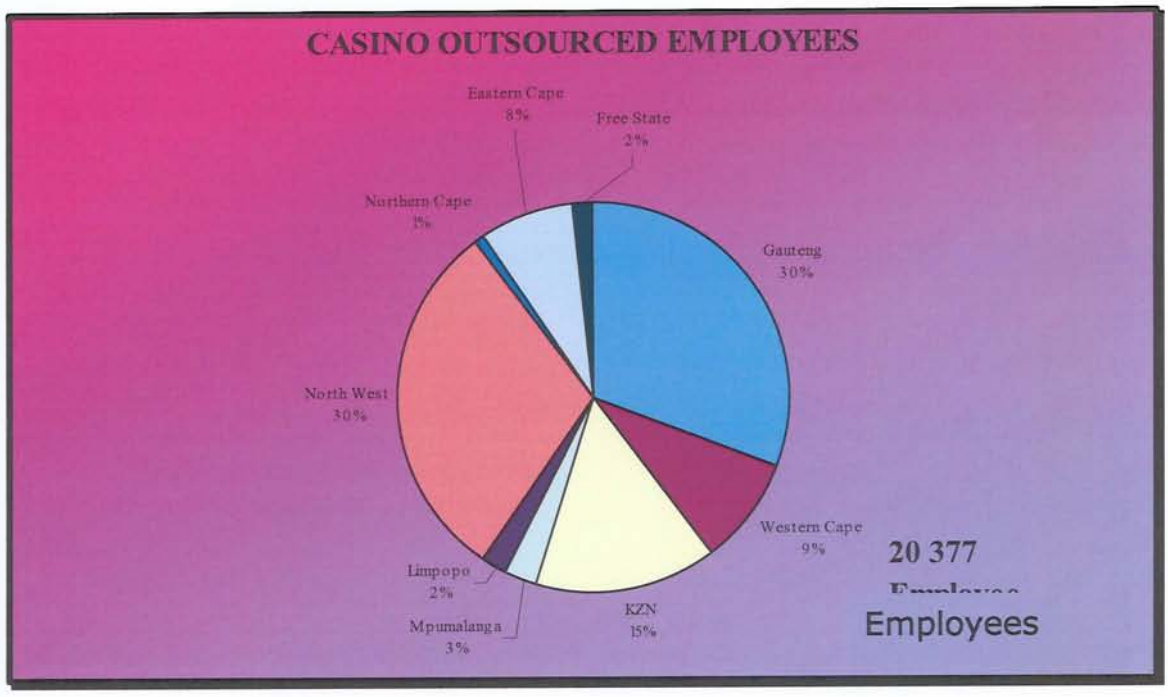
Source: CASA SURVEY

APPENDIX M: NUMBER OF CASINO VISITORS



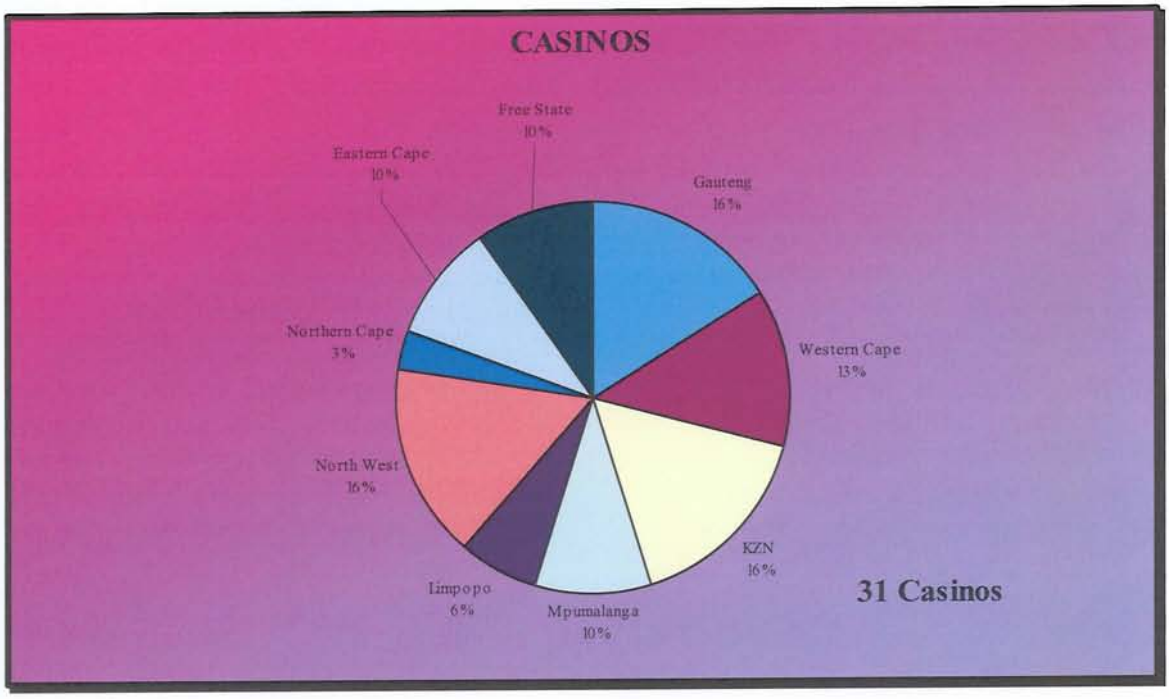
Source: CASA SURVEY

APPENDIX N: NUMBER OF OUTSOURCED EMPLOYEES



Source: CASA SURVEY

APPENDIX O: NUMBER OF CASINOS



Source: CASA SURVEY

A STRATEGIC ANALYSIS OF THE CASINO INDUSTRYAND CASINO MYKONOS

A Working Paper

by A Bezuidenhout, University of Stellenbosch Business School

2007

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report focuses on a strategic analysis of the casino industry as part of the entertainment industry. The external environmental analysis includes a macro PESTE analysis as well as an industry analysis. This is followed by an internal analysis for Casino Mykonos.

The analysis concludes that the casino is not in a very strong competitive position and has to increase its market share to ensure sustainable profitability in a maturing market. Attention needs to be given to advertising and promotion efforts to attract punters and to upgrade the CRM system in order to retain them with the loyalty programme. The declining growth of the market will force them to reduce costs in order to stay competitive and this can be obtained by forming alliances with suppliers as well as sourcing from different suppliers. Because of the casino's social responsibility towards the gambling community, they need to enhance their responsible gambling programme to assist problem gamblers with their addiction. To ensure that the casino satisfies the needs of punters, it needs to increase the variety of entertainment activities provided at the casino and ensure up to date gaming equipment. This will require ample funds because gaming equipment is very expensive. Training and development of the staff to ensure excellent customer service to punters are of great importance. The location of the casino is a big drawback and accessibility can be improved by forming alliances with transport providers. Finally, the information system needs to be upgraded to ensure the timely processing of gambling activities and compliance with the Gaming Board regulations, as well as enabling the casino to move to online gambling.

LIST OF APPENDICES

1. INTRODUCTION

1.1 BACKGROUND

Gambling has always been part of the South African society, though it was illegal under the Apartheids regime, as proclaimed by the Gambling Act No. 55 of 1965 which consolidated earlier restrictions dating as far back as 1673, with the exception of betting on horse races (NGB, 2005-5: 8). Up to 1994 South Africans did gamble, either illegally inside South Africa or legally in the neighbouring homelands of Bophuthatswana, Venda, Transkei and Ciskei. This resulted in a great deal of potential taxable revenue slipping through the government's fingers.

When the new government took over in 1994, they realised the potential gain in government revenue via taxes in legalising gambling in South Africa, but they also had to overcome the dilemma of profitable existing casinos in the homelands that were to become part of the Republic of South Africa.

Gambling in South Africa is currently regulated by the National Gambling Act No. 33 of 1996 and it states that a maximum of 40 casino licences may be granted throughout the Republic, allocating a certain number to each of the nine provinces. Currently 36 licences have been issued, of which only 33 casinos are currently in operation. Additional licences were issued to the Peermont Global and Gold Reef groups. The Peermont Global group have acquired a licence for new operations in the Free State, while the Gold Reef group acquired licences for new operations in the Eastern Cape and Gauteng. The Gold Reef group is also in the process of applying for a licence in the Free State. Thirty five of the 36 casinos are affiliated to the Casino Association of South Africa (see Appendix H). The exception is the Desert Palace Casino in Upington. The CASA affiliated casinos are part of the Tsogo Sun, Century Casinos, Peermont Global, London Club, Tusk Casinos, Gold Reef, and Sun International conglomerates.

Casino Mykonos is a member of the Gold Reef City Casino Group and is situated on the West Coast near Langebaan, amidst the Greek Island resort of Club Mykonos. As it is located on the premises of the holiday resort, the Casino is a favourite pastime opportunity for holidaymakers, especially at night, due to a lack of evening entertainment on the West Coast. Its location on the premises of Club Mykonos provides a perfect opportunity for big gamblers or punters to visit the Casino with the added benefit of overnight accommodation. The location, however, is also a drawback because it is so secluded.

The West Coast community is a poor fishing community and, notwithstanding scarce financial resources, the hope of big winnings lures many local folk to the Casino. The big punters, however, are from out of town as well as from overseas and thus the Casino needs to cater for a vast range of punters and their individual needs. There are approximately 6 000 loyalty card members currently.

The casino is also one of the major employment providers on the West Coast and creates jobs for approximately 180 employees.

1.2 THE AIM OF THE STUDY

The aim of the study is to do a strategic analysis of Casino Mykonos.

1.3 THE SCOPE OF THE STUDY

The analysis will include an external analysis of the casino industry. This will consist of a macro PESTE analysis and an analysis of the industry. An internal analysis of Casino Mykonos will also be undertaken.

2. STRATEGIC INTENT

2.1 VISION

The vision of Casino Mykonos is to provide the best fun and entertainment under the West Coast sun to communities living on the West Coast and its surroundings.

2.2 MISSION

Casino Mykonos is part of the Gold Reef group and provides legitimate gambling opportunities to customers who like the thrill of gambling, either on slot machines or card game tables. The target market consists mainly of professional punters living on the West Coast and surrounding areas, but also of casual punters who try their luck at gambling very occasionally. To please the customers, the casino ensures that it renders professional personalised services and enhances customers' experience with modern technologically advanced gaming equipment.

2.3 GOALS

2.3.1 Financial goals

To increase the market share of the casino in the Western Cape.

To increase the Gross Gaming Revenue percentage.

To lower overall cost.

2.3.2 Strategic goal

To provide the most technologically advanced gaming equipment to attract more customers.

2.4 OBJECTIVES

2.4.1 Financial objectives

To increase the market share of the casino in the Western Cape from five to seven percent by the end of 2008.

To increase the Gross Gaming Revenue percentage by five percent during 2007.

To lower overall cost by one percent annually.

2.4.2 Strategic objective

To attract 10% more customers during 2007 with entertainment activities and technologically advanced gaming equipment.

3. ANALYSIS OF THE EXTERNAL ENVIRONMENT

3.1 MACRO ANALYSIS - PESTE

	WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
Political/Legislative	*National Gambling Act No. 33 of 1996 states that a maximum of 40 casino licences may be granted throughout the Republic. *The Western Cape Gambling and Racing Board regulates all the casino activities in the Western Cape. *The National Responsible Gaming Programme enforces responsible gambling regulations on gambling activities.	*Competition is limited by legislation. The maximum number of casinos in the Western Cape is five. Currently the maximum number of licences are already in operation. *Casinos need to comply with all the regulations to maintain their licence to operate. *Problem gambling becomes more prominent the longer gambling is legalised and regulations will increase in future.	*Need to focus marketing efforts to increase their market share from the current 5% of the total Western Cape market share to ensure a stronger competitive position. ❶[1] *Need to ensure compliance to the regulations to ensure sustainability. ❾ *Need to introduce responsible gambling procedures to ensure that they are socially responsible to their clients. This implies additional cost that will decrease profitability. ❸
Economic	*Currently the casino industry is still in a relatively high growth phase, but is approaching maturity in the near future. *Interest rates increases.	*People spend approximately 1.9% of a possible 3% of their disposable income on gambling (Rataemane & Lighthelm, 2003, 7, 10). 54% of the total spent on gambling is attributed to casinos (NGB, 2005) *The portion of disposable income available for entertainment will shrink, but also increase desperation.	*Need to ensure that the activities provided will attract customers and, therefore, need luring advertising and entertaining activities. ❶ ❹ *Need to ensure that people will spend most of their entertainment money at the casino with luring advertising, but also ensure that the casino operates socially responsible towards desperate punters. ❶ ❸

[1] This numbering is used to identify the different activities.

	*The Rand is weakening against all the major currencies.	*It is relatively cheap for overseas visitors to gamble with large amounts of money.	*Need to attract overseas punters with up-to-date entertainment activities and therefore need to invest continuously in new technology. ❹ ❺ Need well-trained and professional staff, especially at the tables where the potential of big losses exist. These can have devastating results for the casino. ❻
		Big punters are usually professional gamblers.	*Need to ensure that the activities provided will attract all entertainment seekers in the immediate vicinity, but also from the surrounding areas. The location of the casino is a big drawback. ❹
	*In the Western Cape there are five casinos in operation and that is the maximum number granted for the province. Four of the five casinos are in a 300 km radius.	*There is no threat of new casino entrants, but the competition amongst the four casinos in the 300 km radius is stiff. They also compete with other gambling and entertainment activities.	*Need to provide more than gambling activities to ensure more visitors. This aspect needs immediate attention. ❹
	*People want value for their money spent on entertainment and want a wide variety of activities to choose from. *Strong learning and experience curve effects exist.	*Casinos need to provide in all entertainment needs of customers and their families to ensure that they will visit the casino for entertainment. *The longer in operation the more efficient the operations become.	*Need to retain well-trained staff to ensure that the benefits of the learning and experience curves are reaped. ❻

Social	*The population is aging and the number of single people is increasing. *Gambling becomes more socially acceptable. *People are becoming more health conscience and prefer physical activities.	*An analysis of demographics of punters indicated that older and single people prefer gambling as a pastime activity. *It is no longer regarded as sinful to gamble and this contributed to the tremendous growth in the casino industry of the past few years. *Younger people prefer outdoor activities, especially during daytime.	*Need to make the casino accessible to all possible punters. Public transport is not currently available, thus need to form alliances to provide transport. ❼ *Need to attract more punters with luring advertising and educate them not only on how to play the different games, but also to gamble responsibly. ❶ ❻ *To be able to attract younger people, especially during night time, the casino needs to encourage enough outdoor activities in the vicinity. ❹
Technological	*Gambling technology changes at a rapid pace. *Upgrading of equipment is very important to keep attracting customers. *Information technology plays an important role in gambling operations.	*Gambling equipment is very expensive and has high maintenance cost. *Punters prefer to experiment with new technology, but also want familiar equipment to be available. *Need efficient information and surveillance systems to ensure compliance with the regulations of the WCG&RB.	*Need to ensure that available funds are employed optimally to ensure that the newest technology is available and that all equipment is maintained to ensure efficient operation. ❺ ❻ ❽ *Need to ensure that the newest technology is available, together with familiar equipment. Slot machine equipment thus varies from touch screens to one-armed bandits. ❺ *Need to provide funds continuously for the upgrade of the information systems and the surveillance systems to comply with the regulations. Need to ensure that staff have the

			necessary skills to operate these systems and thus need to provide for their training. ❻❽
Environmental	*Casinos have an impact on other entertainment providers and businesses in their vicinity. *Globalisation affects the industry because of the increasing popularity of online gambling that blurs boundaries.	*The impact of casinos on local business can be positive or negative. *Casinos need to become part of the global gambling activities and be less limited by their locations.	*The casino needs to enhance its positive effects on the local business by using local businesses as service providers where possible. Providers of other entertainment can assist in attracting punters and thus relationships must be built. ❹ *The casino needs to investigate the possibilities of online gambling activities. ❾

3.2 *INDUSTRY ANALYSIS*

3.2.1 Industry definition

WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
The FTSE/JSE global classification classifies gambling as follows: Economic group 50: Cyclical Services; Sector 53: Leisure, Entertainment and Hotels; Subsector 532: Gaming. The industry forms part of all gambling activities, but also competes against all other entertainment activities like hotels, leisure facilities and restaurants as well as those of sector 54 that includes media and photography.	Competition is strong and therefore activities provided must be entertaining to attract customers and ensure that gambling obtains the major share of the approximate 3% of the disposable income spend on entertainment activities.	Compete against other gambling activities like other casinos, the lotto, horse races and scratch cards, which are all available in the vicinity. Other non-gambling competitors include movies, restaurants and sports activities. ❹ Need to ensure that the activities provided by the casino will attract people to the casino and will lure them away from other attractions. It has been proven that most casual punters engage in gambling out of curiosity and therefore they need to be near the surroundings of the casino to try their luck. ❼

3.2.2 Current characteristics

	WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
Market size	The market size of gambling is 64% of the total disposable income spent on entertainment. 54% of the gambling spent is attributed to casinos (NGB, 2005).	Due to the large size of the market, it is very attractive to new entrants. Fortunately for casinos, legislation prevents entrance.	Need to increase its market share in this large market by attracting more customers via better entertainment facilities and advertising. ❶ ❹
Market growth rate	The market is still growing, but nearing maturity.	High growth rates will decline in future.	Need to be more efficient to ensure growing profitability.
Capacity	The maximum number of casinos allowed by legislation amounts to 40; currently 36 licences have been granted of which 33 are in operation.	The maximum number of five casinos have already been granted in the Western Cape, thus there is no threat of new entrants.	Need to increase market share from 5% to at least 10% via better entertainment facilities and advertising. ❶ ❹
Profitability	Profitability is high.	This is attractive, but entrance is limited.	Need to increase market share and decrease cost to ensure continuous future profitability growth. ❽
Barriers to entry	Legislation prohibits and limits entry.	Protect current positions and profits of casinos, but need to ensure retention of the largest portion of gambling spent.	Need to ensure that the largest proportion of entertainment spent is on gambling activities provided by the casino and thus need to attract and retain punters with luring activities. ❹

Standardised products	All gambling activities work on the principle of luck and are standardised.	Punters have low switching costs and can easily change entertainment and especially money spent on gambling.	Need to ensure that activities keep up with new developments and stay attractive to punters. ❹ ❺
Technology changes	Gaming technology changes rapidly.	Punters want access to the newest technology as well as familiar ones.	Need to keep up-to-date to attract punters, but also provide less modern equipment for those who prefer it. Staff need to acquire relevant skills to operate new technology. ❺ ❻
Capital requirements	Casino gaming equipment is very expensive and has high maintenance costs – much more than other gambling activities.	Must have enough finances to provide up to date equipment and maintain current equipment.	Employ available capital optimally to ensure up-to-date equipment and the maintenance of current equipment. ❺ ❽
Vertical integration	Very little vertical integration possible, due to complexity of equipment.	Industry tends to outsource all non-core activities.	Need to focus on providing gambling activities and ensure other entertainment activities on site using external providers or doing itself. ❹❺
Economics of scale	Increased number of gambling activities will decrease costs.	The gaming board regulates the number of slot machines and tables per casino through licences granted for each activity.	Need to ensure that the 270 slot machines and nine tables licensed to the casino operate in such a way that they ensure optimal returns. ❺
Product innovation	Slot machine innovations are frequent.	Slot machines are very expensive and have a very short life cycle before they need replacement.	Need to provide for finances to replace 20% of slot machines annually at approximately R 80 000 to R100 000 per machine. ❽

3.2.3 Future driving forces

	WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
Internet	Online gambling becomes more popular and makes location less important.	Online gabling is in direct competition with casinos, because the same activities are provided anywhere around the clock.	Need to explore the possibility of providing online activities, as well as a secure payment system. ❾ Need to make the personal touch count. ❻
Industry growth rate	The market is reaching maturity.	Slowing growth rate will intensify rivalry.	Need to cut costs and increase market share to ensure sustainable profitability. ❷ ❿
Changes in customers and their tastes	*Gambling becomes more acceptable. *People want an all-inclusive entertainment package for the whole family.	*People have fewer inhibitions towards gambling or being seen at a casino. *Need to provide other entertainment on premises than gambling.	*Need to attract non-punters with promotions and advertising. ❶ *Need to provide other entertainment to ensure that families will spend their leisure time at the casino. ❹
Product innovation	Punters want to experiment with new innovative products.	Need to update equipment constantly to keep up with technological developments. Cashless systems and video gambling games are part of the near future developments.	Need ample funds to ensure regular update of equipment to keep pace with innovations. ❽ New innovations will require different employee skills. ❻

Overall impact	**Size**	Demand, and therefore profitability, will decrease with a maturing market. However, the internet, new product innovations and the changing perceptions of punters can spur demand for those who are able to capitalise on the possibilities they present.
	Structure	The changing needs of punters towards an all inclusive entertainment package will increase competition among different entertainment activities, but also among casinos. Those casinos with the most innovative technology, attractive entertainment activities and which will provide internet gambling activities, will have a competitive advantage.

3.2.4 Competitive analysis – Porter's Five Forces

	WHAT	**SO WHAT**	**NOW WHAT – implications for Casino Mykonos**
Suppliers	*>Gaming equipment is not readily available and is imported. Suppliers must be authorised by the Gaming Board *>There are only a few suppliers of gaming equipment. *>Switching costs are high due to machine parts needed for maintenance. *>Gaming equipment is very expensive and is crucial for operations. *<Backwards integration is not an option.	The strength of the supplier force is strong.	Need to establish strategic partnerships with major suppliers that will create mutual benefits for both parties. Need to ensure that more sources are available to choose from. ❷

Buyers	*>Switching costs are low. *>Customers are well informed. *>Customers have the option to postpone their spending on entertainment. *<Backwards integration is not an option.	The strength of the buyer force is strong.	Need to ensure that activities provided satisfy entertainment seekers needs. ❹ Need to establish stronger relationships and thus focus more on the loyalty programmes. ❶
Substitutes	*Other entertainment activities are readily available, but at a fixed price tag. *Non-gambling substitutes satisfy different needs and do not have the possibility of winning money. *<The experience and learning curve play an important role.	The strength of substitutes force is weak.	Need to ensure that gambling activities remain the major preference of entertainment seekers by providing enticing entertainment, state-of-the-art equipment and attractive advertising. ❶ ❹ ❺
Potential new entrants	*<The threat of new casino entrants is low due to legislation, but other entertainment suppliers can enter freely. They are, however not very popular. *<The capital requirements of most entertainment activities are high.	The possibility of new entrants in the entertainment industry is weak.	Need to focus on increasing the market share and providing the type of entertainment preferred by the masses. ❹ ❺
Rivalry among competitors	*>Competitors introduce frequent fresh moves. *>Market growth is slowing down.	Rivalry is moderate or normal, because all competitors are able to earn acceptable profits.	Need to increase market share via additional attractions, up-to-date equipment and luring advertising in order to ensure sustainable profitability. ❶ ❹ ❺

	*>There are only five casino rivals in the Western Cape. *>Gambling activities are standardised. *>Punters have low switching costs.		
Overall strength of competitive forces	The combined strength of all the forces is moderate to strong.	The competitive strength of the five different forces is something to reckon with, because it affects the profitability negatively.	Need to ensure that the strategy matches the competitive conditions, shields the casino against the pressures and ensures a sustainable competitive advantage.

3.2.5 Industry issues

	WHAT	**SO WHAT**	**NOW WHAT – implications for Casino Mykonos**
Problem gambling	The more people gamble the more problems with addiction will occur.	Casinos have a social responsibility towards punters. Currently they have to contribute 1% of their gross gambling revenue towards the programmes of the NRGP.	To combat problem gambling will increase the costs incurred and thus decrease profitability.❸
Entertainment	Punters want more than just gambling entertainment when visiting a casino.	Need to provide a whole range of entertainment activities to satisfy the needs of the whole family at the casino.	Need to attract other entertainment activities to enhance customer satisfaction and to ensure that the casino is the choice provider of entertainment for visitors. ❹

3.2.6 Strategic group maps

	WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
Casinos (See Appendix A and H)	The Western Cape has the third largest number of casino activities. The Western Cape, North West and Kwazulu Natal have obtained the maximum number of casinos and can increase their number of visitors only. The other provinces can increase their visitors and number of casinos.	The Western Cape is in the same strategic group as the North West and is close to Kwazulu Natal. However, casinos of different provinces are not really in competition with one another, because punters prefer casinos in their close vicinity.	Need to ensure that the casino obtains a more prominent portion of the market share in the Western Cape by means of enticing activities and advertising, excellent punter service and up-to-date equipment. ❶ ❹ ❺
Entertainment (See Appendix B)	26% of disposable entertainment income spent is at casinos, 25% at restaurants and 23% at other gambling activities. All the other activities can increase their number of locations as well as the number of visitors, while the number of casinos are limited and, therefore, casinos can only focus on their number of visitors in future.	The casino industry attracts the largest proportion of disposable income to be spent on entertainment, but is in close competition with at least two other activities. The limitations on the number of casinos will force the casino industry to attract more customers in order to ensure increasing revenue.	Need to ensure that gambling remains the major entertainment activity on the West Coast by providing excellent service, attractive advertising and enticing entertainment activities. ❶ ❹ ❻
Gambling (See Appendix C)	Casinos attract 54% of all income spent on gambling activities. There are limitations regarding the number of casinos and race courses, contrary to the other gambling activities.	Casinos attract the largest portion of disposable income spent on gambling. To ensure sustainable profits, they need to attract more punters with luring advertising and attractive entertainment activities.	Need to ensure that casino gambling remains the major gambling attraction on the West Coast. ❶ ❹ ❺

Casinos in the Western Cape (See Appendix D)	Grand West has the largest market share of 76% in the Western Cape due to the number of people living in the metropolis. The small casinos can increase their market share by attracting more customers with a larger variety of activities.	Location is of the utmost importance to the size of the market share, as well as the additional entertainment provided. There is very little the casinos can do about their location, thus they need to focus on their number of visitors.	Need to increase the market share in the Western Cape despite the location, focusing on service, activities, equipment and the personal touch which is impossible at large casinos. ❻
Management groups (See Appendix E)	Sun International is the largest casino group with a 51% share in casino activities. The smaller groups might be acquired by either Sun International, Peermont, Tsogo or the Gold Reef group in future.	The other groups are all relatively small players compared to Sun International. This might change if either of the other contenders acquire some of the existing casinos, after their exclusivity period has expired or new licences.	It is part of the third largest casino group, but the group only has a 9% share in casino activities. Need to increase its market share. ❶ ❹ ❺

3.2.7 Industry key success factors

	WHAT	**SO WHAT**	**NOW WHAT – implications for Casino Mykonos**
Technology	Technology changes rapid.	Punters want to experiment with new technology and are attracted to it, but also want the old technology available.	Need to ensure that new technology is available, thus that there are enough funds to acquire state-of-the-art slot machines and to maintain older ones. ❺ ❽
Locations	Punters prefer casinos in their vicinity.	The major market share belongs to the casino where the largest number of people is situated.	Can do nothing about secluded location and therefore need to ensure that activities are attractive. Focus on personal touch. ❹ ❻

Marketing	Advertising, promotions and loyalty programmes are important.	Good advertising and promotions are crucial to attract punters, especially those from out of town.	Need to attract punters through luring advertising and promotions and by upgrading the loyalty programmes. ❶
Skills / Customer service	Customer service is very important to punters.	Staff need training to ensure that they satisfy customers' expectations.	Need to provide training and focus on the personal touch. ❻
Strong finances	Slot machine equipment and the maintenance of the slot machines are very expensive.	Strong financial funds are necessary to upgrade and maintain equipment.	Need to use funds in such a way that optimal upgrades and effective maintenance are ensured. ❽

4. ANALYSIS OF THE INTERNAL ENVIRONMENT

4.1 CURRENT STRATEGY AND PAST PERFORMANCE

4.1.1 Strategy

The current generic strategy followed by Casino Mykonos is one of broad differentiation, catering for a broad range of punters. The range of services includes not only different card games like poker, pontoon, and black jack on the tables, but also roulette and different slot machine games with different denomination bets. All non-core activities are outsourced and strategic alliances with other entertainment providers like BBQ restaurant and the kids games centre are formed. It operates in a high growth, but maturing market and follows a defensive stance, blocking entry for other non-casino gambling activities.

4.1.2 Evaluation

The strategy is working well as proven by analysis of financial statements of the past four years (see Appendix F). Revenues and ROE are growing and the debt is decreasing. However, the market share is not increasing and thus must become the focus of attention.

4.2 VALUE CHAIN ACTIVITIES

4.2.1 Activities

The value chain activities (see Appendix J) of the company are the following:

Supportive activities: Operating financial and management systems that enable the company to provide data on time, which comply with the Gaming Board regulations, and which form strategic alliances with other entertainment providers or provide it themselves ❹. The training and development of the staff and retaining them ❻. Providing innovative gaming activities to punters, using efficient information systems ❾. Using the CRM capabilities to retain punters ❾ ❻. Operating an efficient surveillance system and procuring assets, spares and consumables from authorised dealers ❷.

Primary activities: Replacing and maintaining gaming equipment ❺. Operating gaming activities efficiently to satisfy customer needs and ensuring quality equipment and activities to contribute to punters' satisfaction ❺. Attracting punters with marketing and promotional efforts and retaining them through a CRM system ❻ ❾. Attending to customers' needs with a friendly staff, ensuring a personal touch as well as solving problems ❻. Having access to skilful staff, training of staff to ensure professional skills, providing training to customers ❻. Providing access to a responsible gambling programme for punters with an addiction to gambling ❸. Ensuring safety precautions to protect the punters.

4.2.2 Processes: Resources, Capabilities and competencies

The major resource of the casino is effective state of the art assets that generate the gambling income efficiently, supported by intangible resources like the culture of caring the casino portrays, as well as a good reputation. Underlying capabilities comprise of the intellectual capital of the staff, their skills and knowledge about gambling and the gambling technology, as well as the information technology expertise that exists.

The competencies derived from the value chain activities that the company does better than some of the other activities they perform are the following: operating efficient financial and management systems, complying with Gaming Board regulations, training and development of the staff, providing innovative gaming activities and operating an efficient surveillance system, operating efficient gaming activities, attending to customers' needs by providing friendly staff who ensure a personal touch and providing effective safety precautions (see Appendix K).

The core competencies originating from the competencies that contribute to the competitive strength of the company are: operating efficient financial and management systems, providing innovative gaming activities, operating gaming activities efficiently and ensuring a personal touch.

The distinctive competencies that create a sustainable competitive edge are the efficient operations and personal touch.

4.3 INTERNAL ISSUES

WHAT	SO WHAT	NOW WHAT – implications for Casino Mykonos
Attracting more customers to increase the market share of the company in the Western Cape.	The market is maturing thus causing growth in the future to slow down. The only way to ensure sustainable profitability is therefore to increase the market share.	Need to focus on advertising and promotional efforts, as well as entertainment activities to attract more punters. ❶ ❻ Improve the CRM system to retain customers. ❾

5. STRATEGY FORMULATION

5.1 STRATEGIC THRUSTS

5.1.1 Competitive strength analysis

The competitive strength analysis (see Appendix G) compares the strengths of the five Western Cape Casinos according to the industry key success factors that were identified in the external industry analysis. Casino Mykonos's competitive strength is weaker than three of its four rivals and thus it needs to improve its technology ❺, financial strength ❽ and advertising and promotional ❶ efforts to ensure a better competitive position and a larger market share, as nothing can be done about the drawback of its location.

5.1.2 SWOT analysis

	EXTERNAL	
	Opportunities	**Threats**
	*Market is still growing slowly. ❾ *Can increase market share. ❽ *Internet gambling. ❾	*Changing technology. ❺ *Changing punter demographics. ❻ *Strong competition from other casinos. *Punters' quest for entertainment activities. ❹

INTERNAL	**Strengths** *Staff skills + know-how and personal touch. ❻ *Strong financial position. ❽ *Product innovation and leading edge equipment. ❺	Use skills, strong finances and leading edge equipment to capitalise on the growing market, increase market share and capture possibilities of internet gambling	Use financial strengths to keep up with changing technology and punter needs, skills and know-how. The competitive position can be improved by obtaining luring entertainment activities.
	Weaknesses *Location ❼. *Lacking brand loyalty. ❻ *Undeveloped CRM system. ❻ *Unsatisfactory alliances. ❹ *Advertising + promotions. ❶	The still growing market and potential new market of internet gambling can minimize the effects of the location. A developed CRM system can create brand loyalty as well as the possibility of increasing the market share.	The location drawback and lack of alliances together with the need to provide entertainment activities, work against attracting punters to increase market share. The undeveloped CRM system, mismatched advertising and promotional efforts, together with the changing punter needs contribute to the problem of attracting punters.

5.1.3 List of actions

The following list of actions, needed to ensure a sustainable competitive advantage, emerged from the external and internal analysis done and are grouped as follows:

No	Group	Actions
❶	Advertising, promotions and CRM system	Need to tailor advertising and promotions around punters' needs to attract them. Need to develop CRM system to ensure that customers can be retained and attracted, identifying their needs and preferences. Need to improve the loyalty membership system to create loyalty and retain customers.
❷	Cutting costs	Need to form alliances with service providers. Need to source different suppliers to procure from.
❸	Responsible gambling programme	Need to enhance programme to assist problem punters and to adhere to social its responsibility.

❹	Entertainment activities	Need to provide a wider variety of entertainment activities to attract punters and thus need to form alliances with suppliers or even diversify into other subgroups of the entertainment industry.
❺	Gaming equipment and technology	Need to ensure that equipment is maintained and replaced to provide leading edge equipment to punters in order to ensure their attraction to the casino.
❻	Training, customer service and personal touch	Need to train and develop staff to enable them to provide excellent customer service and maintain expertise to keep up with ever-changing technology. Need to capitalize on the personal touch possible at the casino to attract and retain punters. Provide training to customers to increase their enjoyment of gambling.
❼	Transport and location	Need to create transportation means for punters to ensure that they can reach the casino easily by alliances with transport companies.
❽	Funds and market share	Need to ensure that funds are available for upgrades of equipment to attract punters and increase market share. Need to use available funds to obtain optimal gaming activities.
❾	IT systems and internet	Need to upgrade information systems continuously to ensure timely processing of gaming activities, compliance with the Gaming Board regulations, update the CRM system and to venture into internet gambling.

5.2 COMPETITIVE APPROACH

5.2.1 Porter's generic strategy

Due to the uniqueness of gambling, a combination of low cost (different denomination games) and differentiation (variation in activities) must be followed. Because casino products are identical, switching cost of punters is low and they use the services in the same manner. There are many ways to differentiate the services, as punters want variation and gaming technology changes fast.

5.2.2 Defensive / offensive stance

a. Miles and Snow typology

The best stance according to the Miles and Snow typology is that of an analyzer, because the external market characteristics indicated that the gambling markets are in a late growth, early maturity stage and that more than one service targets the majority of punters. Technology changes fast with ever-new emerging gaming equipment, modifications and improvements to the equipment. There are many gambling competitors, but only one has a major market share. The internal business strength is good service development. The casino is seldom a first mover and makes fewer and slower product-market changes. It thus needs to take a defensive stance by blocking open avenues to other gambling activities, as well as signaling retaliation. The casino needs to maintain a stable, limited line of products and follows a carefully selected set of promising new developments.

b. Strategic position and action evaluation (SPACE)

This evaluation confirms the Miles and Snow typology which indicates that a conservative posture is needed: the market is stable with low growth, the casino experiences financial stability and the competitiveness of the gambling activities is crucial. Costs need to be reduced, cash flow must improve to enable the casino to keep up with technology changes, new entertainment activities must be provided and entry into new markets will solve low market share problem. (see Appendix I)

5.2.3 Strategic warfare strategy

The casino is seldom a first mover. It thus needs to take a defensive stance to protect its position and thus block open avenues to other gambling activities, as well as signaling retaliation with better promotions if its market share is threatened.

6. CONCLUSION

Though Casino Mykonos is not in a very strong competitive position due to the location and lack of other entertainment activities, all is not lost. They need to increase their market share and will only be able to do that by providing a variety of entertainment activities to satisfy customers' needs, ensuring state-of-the-art gambling equipment and attracting customers with luring innovative advertising and promotional efforts. It is of the utmost importance to increase the market share, because the gambling industry is reaching maturity and therefore slower growth possibilities are in the near future.

When venturing into the provision of other entertainment activities, it can either form alliances with external providers or decide on a corporate strategy towards diversification into other forms of entertainment. However, before it decides on an approach, a thorough analysis must be completed, investigating the following:

Whether it should diversify: changing needs of punters, not to have all its eggs in one basket, stagnating revenues and diminishing opportunities. This will also involve an overall industry-attractiveness evaluation of key success factors to determine the profit potential.

The nature of the diversification and degree of involvement ranging from a mere investment to active intervention.

How to diversify: Merger or acquisition, start-up, licencing, franchising, joint ventures or by forming strategic partnerships.

The synergies in related diversification, investigating the possibilities of leveraging cross value chain relationships or synergies, thus whether it will improve the overall competitive advantage. There should therefore be either a market, operation, management, culture or strategic fit.

The cost of entry test to determine whether the investment will pay back within a reasonable time, as well as the current trend at other successful casinos.

The implementation of the strategic fits to ensure that the benefits are captured and that the result will be 1 + 1 = 3, thus increasing shareholders' value. If Casino Mykonos decides to diversify into other entertainment activities, it should manage the portfolio by evaluating the corporate strategy and the attractiveness of the investments. This can be done by evaluating the:

Attractiveness of the different industries with the General Electric Portfolio Nine-cell Model.

The synergies in terms of:

Resources, using the Boston Consulting Group Portfolio Matrix to determine the financial fit.

Strategy, using the value chain activities to compare and capture cross-business value chain fits.

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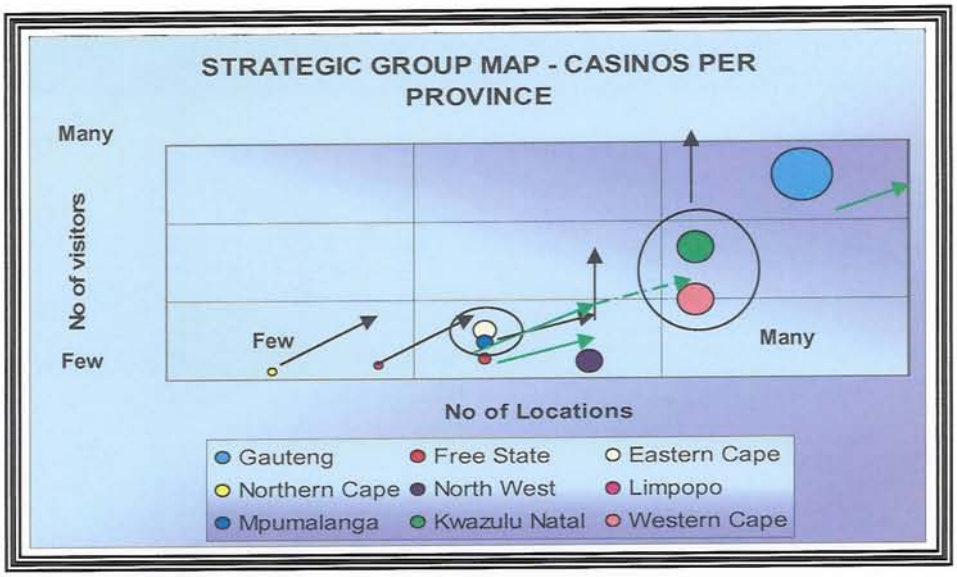
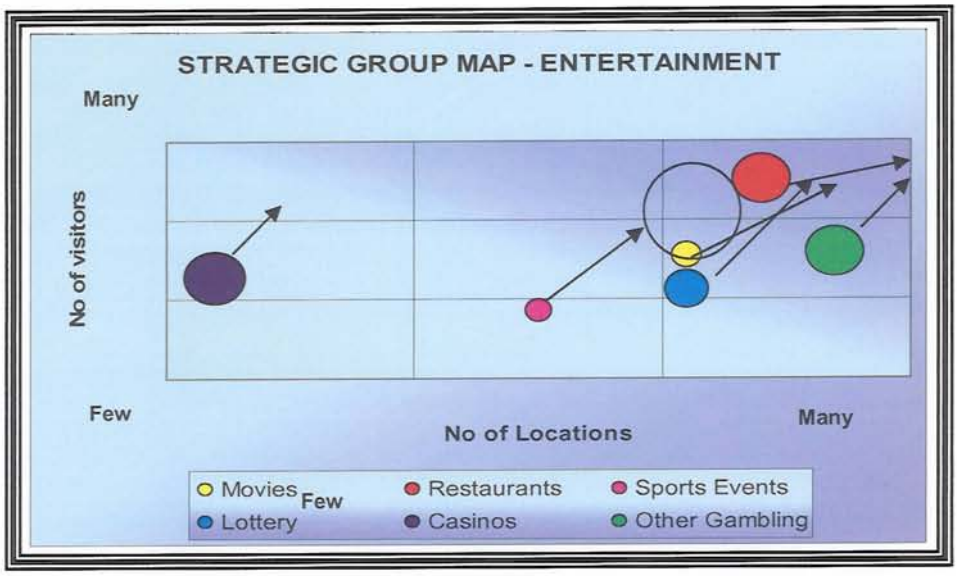
LIST OF APPENDICES

Appendix P: STRATEGIC GROUP MAP OF THE NUMBER OF VISITORS VS THE NUMBER OF CASINOS PER PROVINCE[2]



Source: CASA, NRGP and NGB

Appendix Q: STRATEGIC GROUP MAP OF THE NUMBER OF PARTICIPANTS VS THE NUMBER OF LOCATIONS FOR THE DIFFERENT ENTERTAINMENT ACTIVITIES[3]



Source: CASA, NRGP and NGB

Appendix R: STRATEGIC GROUP MAP OF THE NUMBER OF PARTICIPANTS VS THE NUMBER OF LOCATIONS FOR THE DIFFERENT GAMBLING ACTIVITIES[4]

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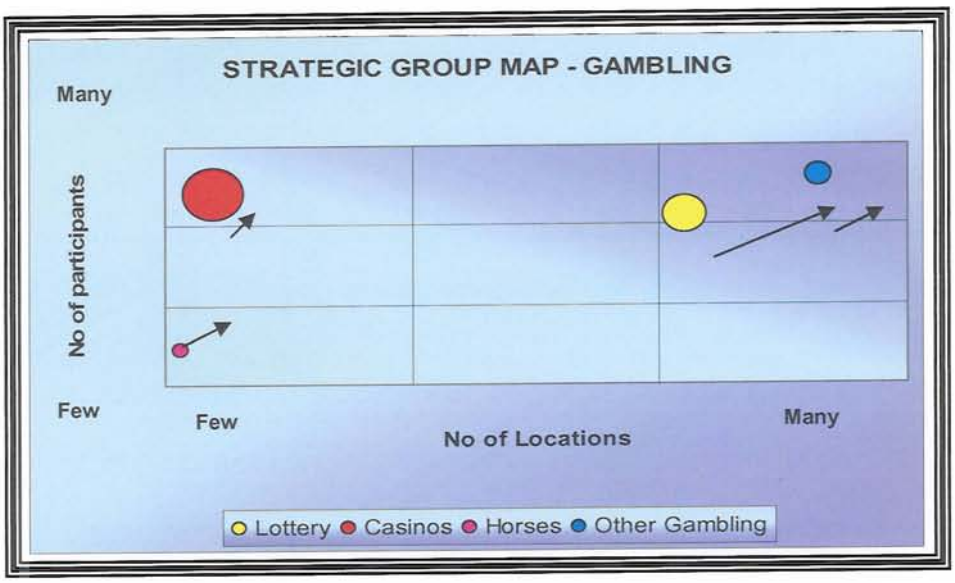
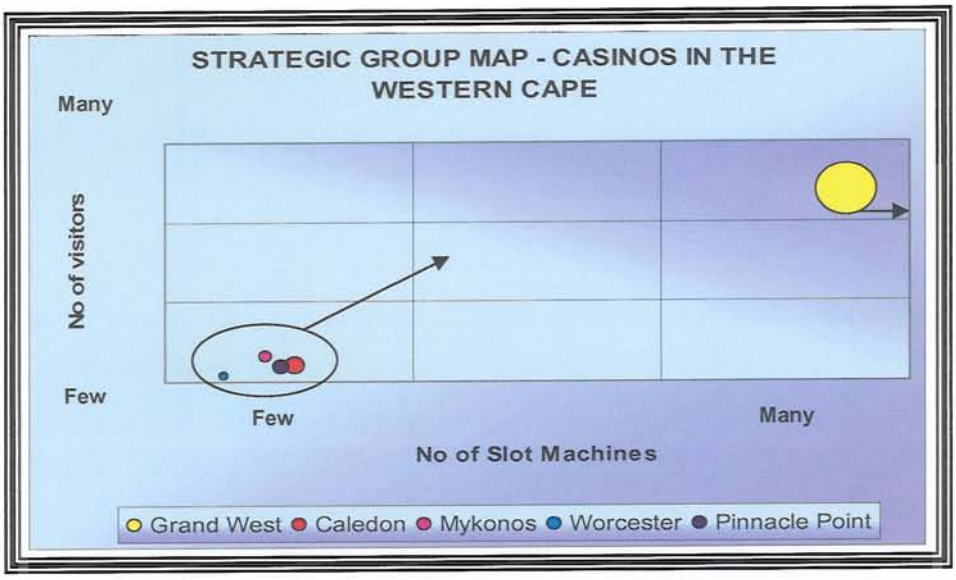
[2] The circles are drawn proportionate to the revenue generated per province. Additional licences have been granted in the Free State, Eastern Cape and Gauteng.

[3] The circles are drawn proportionate to the revenue generated per entertainment activity.



Source: CASA, NRGP and NGB

Appendix S: STRATEGIC GROUP MAP OF THE NUMBER OF VISITORS VS THE NUMBER OF SLOT MACHINES PER CASINO IN THE WESTERN CAPE[5]



Source: WCG&RB

Appendix T: STRATEGIC GROUP MAP OF THE NUMBER OF VISITORS VS THE NUMBER OF CASINOS PER MANAGEMENT GROUP[6]

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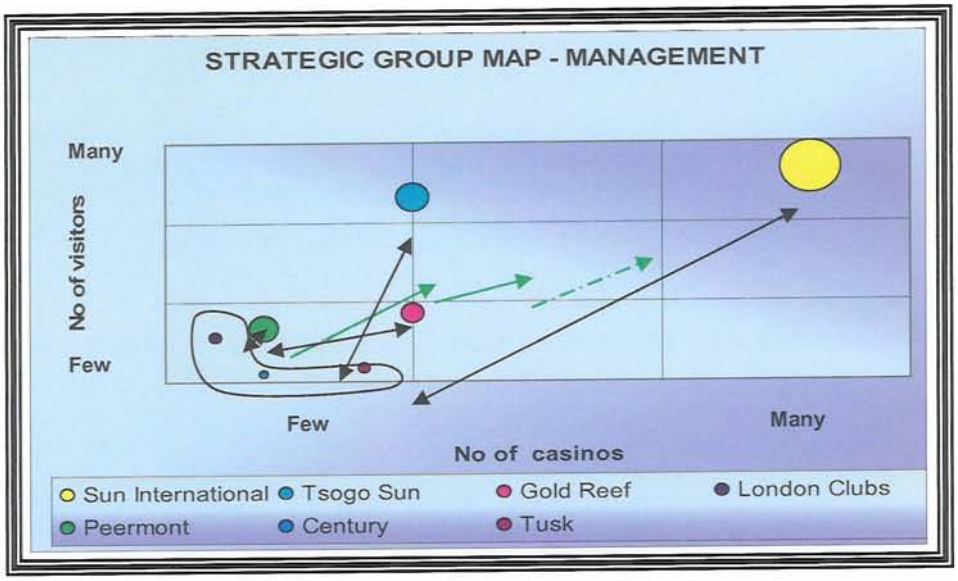
[4] The circles are drawn proportionate to the revenue generated per gambling activity. Other gambling activities are jackpots, scratch cards, fafi, bingo and dice.

[5] The circles are drawn proportionate to the market share per casino.

[6] The circles are drawn proportionate to the payroll per management group. The Peermont group has obtained an additional licence to operate in the Free State and Gold Reef group has obtained two additional licences to operate in the Eastern Cape and Gauteng. The Gold Reef group is also in the process of applying for a licence in the Free State.



Source: CASA, NRGP and NGB

Appendix U: CASINO MYKONOS FINANCIAL ANALYSIS

	2002	2003	2004	2005
Gross Revenue %	36.17%	40.32	69.4%	72.5%
Net Profit %	5.38%	10.46	13.67%	19.05%
Current ratio	0.97	0.5	0.75	0.23
Debt/asset ratio	1.08	0.97	0.23	0.45
ROA	0.14	0.25	0.38	0.51
ROE	-0.54	4.55	0.84	0.57
NAV	-44.5	12.7	113.0	275.9
Visitors	469 166	603 844	667 912	828 558
Market Share	4.92%	4.48%	5.12%	5.03%
Revenue growth rate over past four years		**22.3%**		
Net profit growth rate over past four years		**86.5%**		
Visitors' growth rate over past four years		**20.8%**		

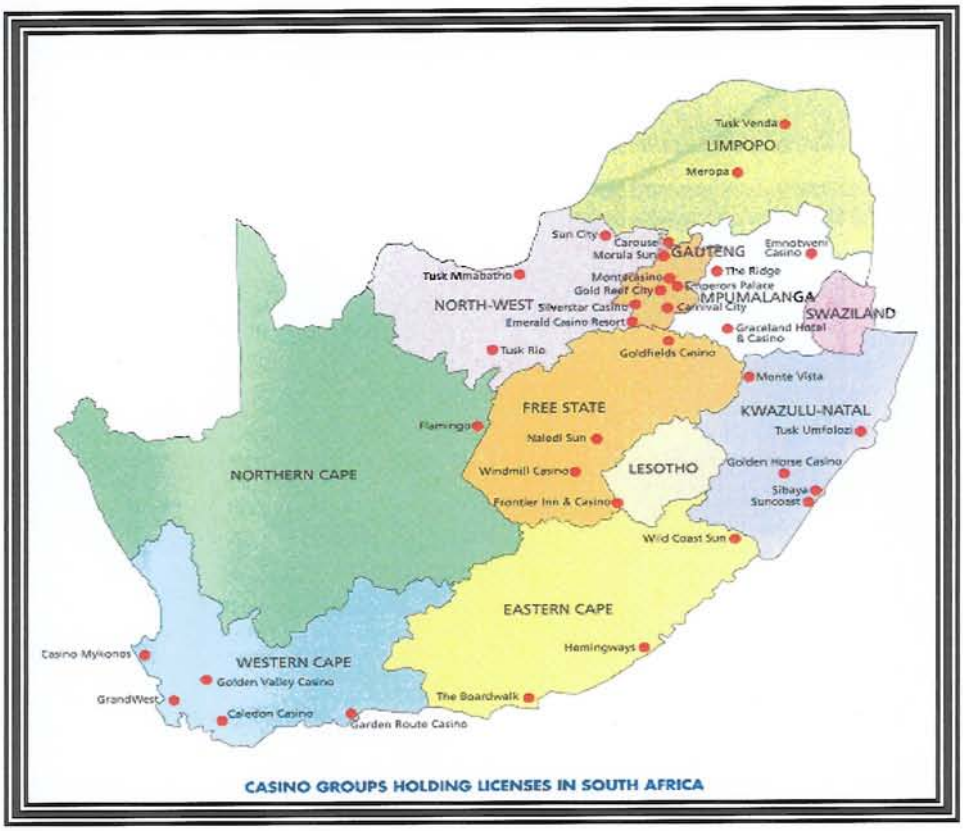
Source: Mykonos Financial Statements

Appendix V: COMPETITIVE STRENGTH ANALYSIS – CASINOS IN THE WESTERN CAPE

IKSF	Weight	Mykonos		Grand West		Caledon		Worcester		Pinnacle Point	
Technology	0.3	7	2.1	8	2.4	7	2.1	6	1.8	7	2.1
Financial Strength	0.2	7	1.4	9	1.8	7	1.4	4	0.8	8	1.6
Location	0.2	7	1.4	10	2.0	8	1.6	4	0.8	9	1.8
Advertising & Promotions	0.2	5	1.0	7	1.4	6	1.2	4	0.8	4	0.8
Customer Service	0.1	8	0.8	5	1.0	6	0.6	6	0.6	7	0.7
TOTAL	1	6.7		8.6		6.9		4.8		7.0	

Source: Thompson, Strickland and Gamble

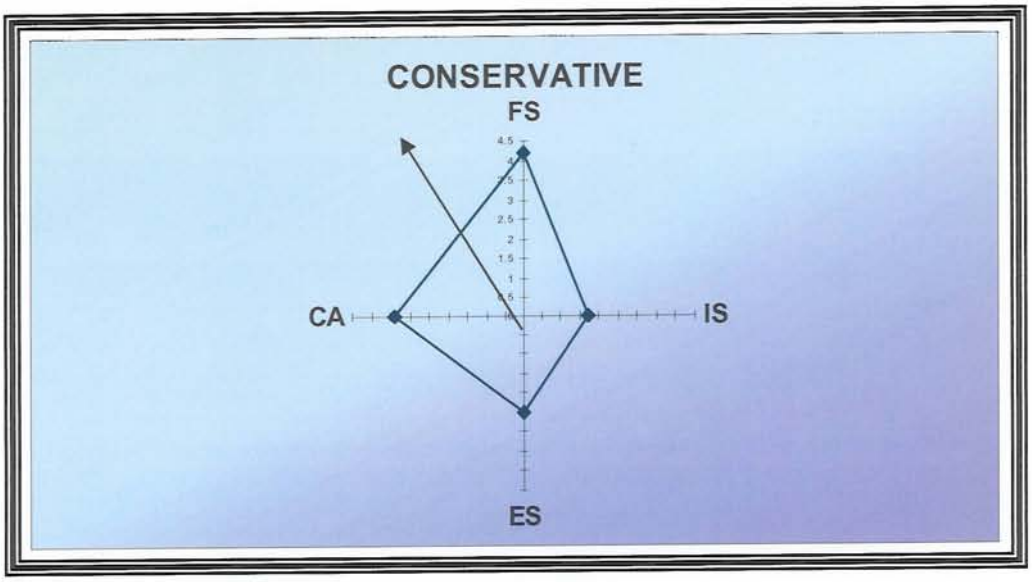
Appendix W: CASINOS IN SOUTH AFRICA



Source: CASA

Appendix X: SPACE DEFENSIVE/OFFENSIVE STANCE ANALYSIS

EXTERNAL			
Environmental strength		**Industry strength**	
Techno changes – many to few	4	Growth potential – low to high	1
Inflation rate – high to low	5	Profit potential – low to high	3
Demand variability – large to small	3	Financial stability – low to high	3
Price range rival products – wide to narrow	6	Techno know how – simple to complex	4
Barriers to entry in market – few to many	3	Resource utilisation – inefficient to efficient	3
Competitive pressure – high to low	1	Capital intensive – high to low	2
Price elasticity – elastic to inelastic	3	Ease of entry – low to high	4
		Productivity, capacity utilisation – low to high	2
-6 + 3.5	**-2.5**		**2.7**
INTERNAL			
Competitive advantage		**Financial strength**	
Market share – small to large	3	Return on investment – low to high	5
Product quality – inferior to superior	4	Leverage – Imbalance to balanced	5
Product life cycle – late to early	2	Liquidity – Imbalance to balanced	5
Product replacement cycle – variable to fixed	2	Capital needed + available – high to low	2
Customer loyalty – low to high	1	Cash Flow – low to high	4
Rival's capacity utilisation – low to high	5	Ease of exit – difficult to easy	4
Techno know how – low to high	4	Risk involved – high to low	5
Vertical integration – low to high	0		
-6 +2.6	**-3.4**		**4.2**



Source: SPACE

Appendix Y: CASINO MYKONOS VALUE CHAIN ACTIVITIES

<table>
<tr><td rowspan="4">Support activities</td><td colspan="3">Infrastructure:
*Efficient financial and management systems for timely processing of data.
*Compliance with Gaming Board regulations.
*Strategic alliances with other entertainment suppliers.</td></tr>
<tr><td colspan="3">Human resources:
*Training and development of staff.
*Retention and recruiting of knowledgeable staff.</td></tr>
<tr><td colspan="3">Technology and development:
*Innovative up to date gaming activities.
*Efficient state of the art information systems to comply with Gaming Board requirements.
*Efficient surveillance systems to comply with surveillance regulations.
*CRM database capabilities.</td></tr>
<tr><td colspan="3">Procurement:
*Buy from authorised dealers, preferably BEE local dealers making bargaining for good prices difficult.</td></tr>
<tr><td>Primary activities</td><td>Operations
*Equipment replacement and maintenance schedule.
*Efficiency of gaming operations.
*Quality assurance of gaming equipment and activities provided.</td><td>Marketing
*Effectiveness of marketing to attract punters.
*Effectiveness of promotions and jackpots to attract punters.
*Loyalty programmes to create loyalty from punters and retain punters.</td><td>Customer service
*Friendly staff - personal touch.
*Knowledge of staff concerning operations and technology.
*Ability of staff to solve problems.
*Safety measures to protect punters.
*Training provided for punters.
*Responsible gambling programme.</td></tr>
</table>

Appendix Z: COMPETENCIES, CORE COMPETENCIES AND DISTINCTIVE COMPETENCIES

		Activities	Competencies	Core competencies	Distinctive competencies
Support activities	**Infrastructure**	Efficient financial and management systems	X	X	
		Compliance with the Gaming Board	X		
		Strategic alliances			
	Human resources	Training + development			
		Staff retention			
	Technology and development	Innovative equipment	X	X	
		Information system			
		Surveillance system	X		
		CRM			
	Procurement	Authorised dealers			
Primary activities	**Operations**	Equipment replacement and maintenance			
		Efficient operations	X	X	X
		Quality assurance			
	Marketing	Marketing efforts			
		Promotions			
		Loyalty programme			
	Customer service	Personal touch and friendly staff	X	X	X
		Training of punters			
		Staff skills	X		
		Safety	X		
		Responsible gambling			

AN ETHICAL DILEMMA IN THE CASINO INDUSTRY

A Working Paper

by A Bezuidenhout, University of Stellenbosch Business School

2007

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INTRODUCTION TO THE ETHICAL DILEMMA

Mr Jo Jackson, one of the managers of YY Casino, is facing a dilemma. Should he or should he not grant a loan to one of the punters. He received a phone call from a very troubled and anxious wife of one of the major punters at the Casino, Mr Bob Dobson. Mrs Dobson was in a terrible state, crying and pleading with Jo not to grant any credit to her husband who was on his way to the Casino with the last of their money, approximately R50 000. According to her, Bob had a feeling that it was his lucky night and that his winnings would enable him to solve all their financial problems.

Jo knew Bob rather well, as he was a regular big punter and a prominent business man in the local community. He also knew that Bob was a punter with a tendency towards problem gambling and that he had lost large amounts of money during the past few weeks at the casino. Rumours also had it that things were not going well with Bob's business and that he faced legal suits from angry creditors who had not received payment in time. His business was in danger of being liquidated if he did not pay off his liabilities.

To make things worse, Jo's wife and Mrs Dobson were old friends. The families sometimes visited each other over weekends to have braais together, and the children were school mates and Bob and Jo often played golf together.

Jo was faced with a dilemma, because it was 10 days to year end and the casino was struggling to make budget due to a major loss by the house on the Black Jack tables to a big American punter who had visited the casino during the past few weeks. This could be his big opportunity to show head-office that he was highly efficient and the obvious successor of the soon-to-be-retired general manager. He was able to turn things around and increase the chances that the budget was met. Not only would this ensure his future career in the casino industry, but it could also affect his profit incentive management bonus for the year.

Jo saw Bob on the surveillance monitors when he entered the casino and had a bad feeling about Bob's ability to win, because history has proven that desperate punters who play with their life savings or who play on credit rarely ever win back their money and nearly always lose everything to the casino. A few hours later the knock came on his office door. Needless to say, it was Bob. Bob begged him to allow him to play on credit and wanted to borrow R100 000 from the casino. He was willing to pledge as security his business, his house, his car and even his wife's jewelry she had inherited from her grandmother.

One needs to determine whether this is a moral dilemma. According to the RIMS strategy (Rossouw & Van Vuuren, 2004: 99) one needs to generate and evaluate all points of view which satisfy the criteria of a moral argument: not being selfish, being clear and intelligible and factually correct.

The casino's point of view:

It is customary to grant credit facilities to regular punters if they can provide the necessary security to cover the risk. Thus, if a regular customer with security asks for a loan, it must be granted.

Managers must act in the best interests of the casino and must not allow personal feelings to affect their judgment. The profitability of the casino affects the job security of all employees.

The community's point of view:

All business enterprises must be conducted in a way that is beneficial to the community. If decisions of one enterprise could mean the downfall of another, it would affect the community negatively and create more unemployment.

Casinos provide employment and also attract tourists. This stimulates the economy of the community and it is therefore crucial to the community that they continue their operations.

Bob's point of view:

He is a regular punter and according to the rules he is entitled to a loan provided he can supply security. He desperately needs a chance to change his bad fortune of the past few weeks.

Jo's point of view:

He is a manager and must act in the best interest of the casino, keeping in mind the jobs of all the employees which are at stake if the casino were to close its doors.

He is actually obliged to grant a loan if security is provided, according to the rules applicable to the casino.

Bob is a personal friend and whatever decision he makes, he must be able to live with the consequences.

Those, however, are not his biggest dilemmas. Casino employees are not supposed to have friendship relationships with punters and he ignored the rule. If this comes out his job can be at risk.

He needs to think about his own future and his potential promotion which will enable him to provide substantially better for his own family.

All the above arguments are moral arguments, because the interests of some people are detrimentally affected. Except for the last two arguments in Jo's case, they can be deemed as being selfish. All arguments are clear and intelligible and all arguments are factually correct.

BACKGROUND INFORMATION

During the early 1990's, before casinos were legalised in South Africa, gamblers flocked to the Homelands outside the borders of the "old" South Africa to indulge in this "illegal" pleasure.

As casinos were situated in the Homelands, the South African Government had little influence on the way business was conducted. This situation changed after 1994, when casinos were legalised and government intervened via the Gaming Boards and the Responsible Gambling Programme to establish rules and regulations according to which the casinos had to operate. During those years (unlike the present where granting credit facilities are prohibited by the regulations of the Gaming Boards) it was customary for casinos to grant credit to regular major punters.

The Homeland casinos were all part of international conglomerates and the only rules and regulations they had to adhere to were those of their parent companies. These rules were mainly to ensure a profitable bottom line. It was crucial to make the budget, because management received incentive bonuses based on profits and thus it was important for all to ensure maximum profits.

Casinos also provided a variety of jobs to a great number of local people and therefore contributed in alleviating the poverty that existed in the Homelands. Not only were casinos creators of employment, but they also contributed to the economy by means of creating tourism opportunities for these poor communities. It was thus of vital importance to the communities that the casinos kept on operating, because if they were to cease their operations due to unprofitability, the community would be affected negatively.

IMPLICATIONS OF DIFFERENT RESPONSES

Internally, the employees and managers will be affected by Bob's decision as it may place their jobs at risk. Externally, the decision will impact on Bob and his family, his business and his employees, as well as the community as a whole.

If the loan is granted and Bob wins:

Bob can save his business and ensure his employees of an income and pay his creditors.

The casino will suffer a loss and theoretically head-office may decide to close the doors, affecting all casino employees, as well as the community, negatively.

If the loan is granted and Bob loses:

Bob will lose his business and all his employees will lose their jobs. It may even lead to Bob being declared bankrupt.

The personal friendship between Bob and Jo may be affected negatively on a permanent basis, because problem gamblers tend to pass the guilt on to others.

The casino will be in a better financial situation than before, having acquired Bob's money plus the amount lent to him. This may enable the casino to make budget and remain in operation; employees will keep their jobs and the community will continue to benefit from tourism.

There is also the risk that the casino may partially forfeit the amount granted as a loan if Bob's assets do not cover all his debts, but they will still be better off than before.

Problem gamblers are usually depressed and some even see suicide as an option to solve their problems.

If the loan is not granted:

Bob may still lose his business and then his employees will lose their jobs, but at least his debt will be R100 000 less. Maybe he can reach an agreement with his creditors to pay off his debts without having to close his business.

The personal friendship between Bob and Jo may be affected negatively in the short term, because Bob will accuse Jo, who has declined the loan, of being the cause of all his problems.

Head-office may judge Jo's decision as being unwise, as he had neglected the opportunity to increase profits and this may be detrimental to his career in future.

Whether the loan is granted or not:

If the personal relationship between Bob and Jo comes to light, head-office will definitely view it as a conflict of interest and Jo can lose his chance of promotion or even his job.

CONCLUDING REMARK

Jo needs to make a decision whether to grant credit facilities to Bob or not. This decision may either be detrimental to the casino or to Bob, his family and his employees. Whether the loan is granted or not, it will affect the whole community in some way.

LIST OF SOURCES

Rossouw, D. & Van Vuuren, L. 2004. *Business Ethics*. Third Edition. South Africa: Oxford University Press.

OPTIMISATION OF PROFIT BY EVALUTION OF MIX OF SLOT MACHINES & OPTIMISATION OF CUSTOMER SERVICE BY EVALUATION OF QUEUING AT CASH DESKS

A Working Paper

by A Bezuidenhout, University of Stellenbosch Business School

2007

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DEFINITIONS

The following terminology applicable to the gaming industry has been used interchangeably in this assignment:

Dacom System:	Computerised system that controls the slot machines in the Casino. This system regulates the hold percentages of machines and determines the turnover and wins of the different slot machines.
Hold percentage:	Percentage of the turnover retained by the Casino.
Hold / Win:	Profit made by the slot machines.
Handle:	Turnover, being all the money deposited into the machines.
Punter:	Gambler

COMMENTS: GENERAL MANAGER

I scrutinized the project done by group 7. Whilst there are so many more variables that can be considered when planning the ultimate Casino floor mix, it is pleasing to see how quickly this group has gasped the basics of Casino statistics. The solutions that they have come up with are quite realistic, and will definitely be a point of discussion for possible implementation between myself and my management team.

This is also the case in the analysis, and report back on the cashier queuing system that is also included in the project. A great deal of time and effort by this group has gone into providing the basic information for the reaching of the conclusions.

For this and for the returning of actual workable solutions this group must be commended.

CLIVE VAN GROENINGEN

GENERAL MANAGER : CASINO MYKONOS

1. EXCECUTIVE SUMMARY

The aim of this assignment is:

1. Assist Casino Mykonos to maximise the slot machine profit (win) in determining the optimal combination of different types of slot machines and different denominations of each type. Slot machines are considered the "cash cows" of the Casino and therefore it is vital that their profits are optimised.

2. To determine the optimal number of cashiers needed on duty during peak times to ensure customer service of acceptable quality and to ensure that customers do not spend too much time in queues, which time could have been spent gambling.

The first problem was dealt with by means of linear programming, utilising information obtained from the Dacom computerised system currently used by the Casino. The average win (profit) generated by the different types and denomination of each type of machine per day according to the 2004 information, was used to determine the optimal number of each type and denomination to generate maximum profit for the Casino. This assignment only takes the gross profits generated by slot machines into account and does not take other expenses like depreciation and maintenance into account. The reason for not taking depreciation into account is that the cost price of all slot machines is more or less the same, thus depreciation expenses would be similar across machines. In the case of repairs and maintenance, a high degree of variability therein prevents any reliable assumptions in values thereof. In addition the same information was used in a goal programming exercise to compare results, where certain minimum constraints have higher priorities than others. The maximum hold percentages per type and denomination of machine was determined using the average turnover per machine per day in 2004 to ensure maximum profits. Finally the optimal number of different types and denominations of machines as well as the optimal hold percentages was determined.

The second problem was solved using a queuing model built from the information obtained by the study group while spending a weekend at the Casino observing the queues during peak times. The possibility of one service point was tested by means of simulation to derive an answer. Due to extraordinary peak times during public holidays which could differ from the observations made by the team, information obtained from the security system together with certain assumptions was used to determine the amount of servers (cashiers) needed during extraordinary peak times.

2. BACKGROUND

Casino Mykonos is a member of the Gold Reef City Casino Group and situated on the West Coast near Langebaan, amidst the Greek Island resort of Club Mykonos. As it is located on the premises of the holiday resort, the Casino is a favourite pastime opportunity for holidaymakers, especially at night, due to a lack of evening entertainment on the West Coast. Its location on the premises of Club Mykonos provides a perfect opportunity for big gamblers or punters to visit the Casino with the added benefit of overnight accommodation.

The West Coast community is a poor fishing community and, notwithstanding scarce financial resources, the hope of big winnings lures many local folk to the Casino. The big gamblers, however, are from out of town and thus the Casino needs to cater for a vast range of punters and their individual needs.

3. PROBLEM STATEMENT

3.1. OPTIMAL NUMBER OF SLOT MACHINES

In terms of the rules and regulations of The Gambling and Racing Board of South Africa, all Casinos are required to follow a strict code of conduct. Currently, Casino Mykonos is licensed to operate 262 slot machines, but have obtained eight extra licences, bringing the total number of machines to 270. Fot the Casino to obtain licenses for additional slot machines, the Gaming Board needs to approve the new layout of the Casino as well as surveillance equipment adjustments. The maximum number of slot machines that the Casino can house is approximately 300. As these machines generate the most revenue within the Casino environment, it is vitally important to ensure that the 270 machines are structured to generate maximum possible profit (or win) to the Casino. The maximum hold percentage of the handle (turnover) that the Casino can retain as a win, is 15%.

Slot machines form the "bread and butter" of Casinos because:

- They are easy to operate, very entertaining and do not require significant skill or concentration. This ensures that slot machines are very popular with the general public.
- The machines are programmed to make different percentages of payouts to customers at random times to a minimum of 85% of the turnover. This programming ensures that these machines remain profitable over time.

Tables (Black Jack, Pontoon, Poker and Roulette), on the other hand, need skilled punters, much concentration and, due to the human influence of the dealer and the luck itself, the "dice" can roll in favour of either the house or the punter, thus no profits are guaranteed.

With the Casino being in operation since 2000, most of the current slot machines will require upgrading/replacement in the near future. This, coupled with the eight new licences recently obtained, necessitates careful consideration of the technological advances made on Casino equipment to ensure both customer satisfaction and maximum profits for the Casino. Ultimately, a sound balance between the different denominations, variety of machines and hold percentage per machine is required.

There are different types of machines (Reel, Video, Poker and wheel of gold machines) and each type can operate different denominations varying from 2 cents to R10. The aim of this study is to determine how many of each type of machine and of each denomination therein together with optimal hold percentages will ensure maximum profit for the Casino.

This study will use 2004 information obtained from the Dacom system to determine the average daily profit (win) (see Appendix 1a) and turnover (money played) (see Appendix 1b) for each type and denomination machine generated during 2004, taking into account the constraints imposed by the Gaming Board, as well as by the management team of the Casino (see Appendix 2a).

The management team was requested to prioritise different goals to obtain a different view on the answer by using goal programming techniques. See Appendix 2b for these different goals.

Finally the constraints of hold percentages were taken into account to recalculate the optimal solution as seen in Appendix 2c.

3.2. QUEUING AT THE CASH DESKS

Although the cash desks at the Casino operate in much the same manner as that of a commercial bank, Casino clients cannot (due to the uniqueness of the chips, tokens and cheques) move to another service provider if they are not satisfied with the service. Notwithstanding this, the Casino strives to render satisfying service to clients to

ensure a pleasurable experience – after all, they are selling entertainment with the hope of financial gain for the punters.

There are two cash desk locations at different points in the Casino – one in the smoking and one in the non-smoking area. Each cash desk location has the ability to house three servers.

This study aims to minimise the waiting time of customers in the queues, especially during peak times (normal peak times during weekends and extraordinary peak times during public holidays) at the cash desks. The information obtained from the queuing model was used to determine the optimal number of service points needed to provide for the needs of the customers. Currently two service points at each location are always open during peak times, but management feels that it could be reduced to one service point at one location. The costs involved per service point are the salaries of the clerks at the service points and well as a supervisor for each location.

The group performed a physical observation of the queues at the cash desks, situated at the two different locations in the Casino. It appeared on observation that these facilities are efficient in servicing clients, as no long queues were observed and clients appeared to wait a short amount of time.

The distribution of interarrival times of customers, as well as the service times are approximately exponentially distributed due to the fact that $\mu \approx \sigma$ and the assumption that deviations to the exponential distribution occurred due to the human factor involved in the timing process (see Appendix 3). Thus queuing models for exponential distributions for interarrival times and service times were used. It is acknowledged that an adjustment of 0.13 minutes needs to be made to the service times due to a minimum service time of 0.13 minutes, but due of the insignificance of the value, it is ignored.

Extraordinary peak times occur during public holidays and information obtained from the security system was used to determine the number of servers needed during these times. Assumptions about the mean arrival time and mean service time were based on the average number of guests per minute that visited the Casino during the peak times.

4. CONCLUSION

4.1. SLOT MACHINES

First, (in order to maximise profit) the optimal mix of machines was determined taking the average daily win per machine and denomination for 2004 into account. This was done for 262 and 270 machines without changing the current hold percentages (see Appendix 4a & b & c and 5).

The current volume of 262 machines generated a profit of R53 million for 2004 with the following mix:

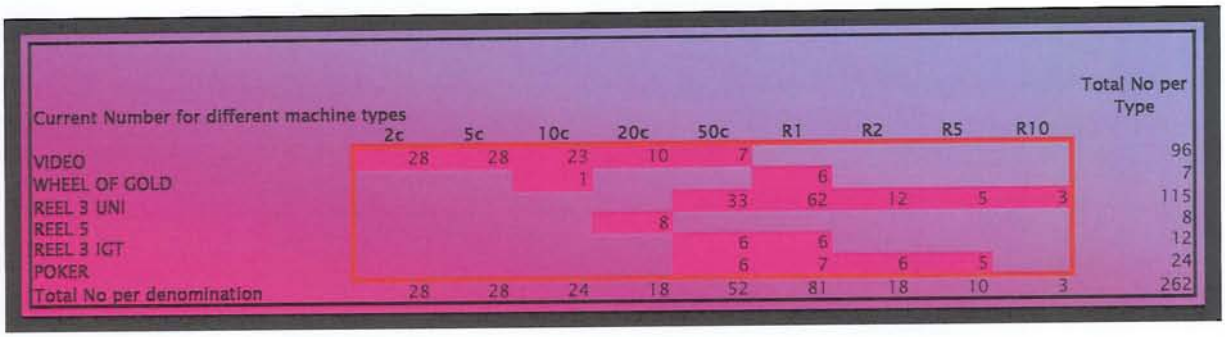


Figure 1: Number of different machine types and denominations currently in use

Source: T1a Current No Machines and Dacom System

The following optimal solution was obtained keeping the number of machines at 262. This mix generates a profit of R84.7 million:

Figure 2: Optimal solution for the different machine types and denominations (LP)

Source: T1b Linear Programming No Machines

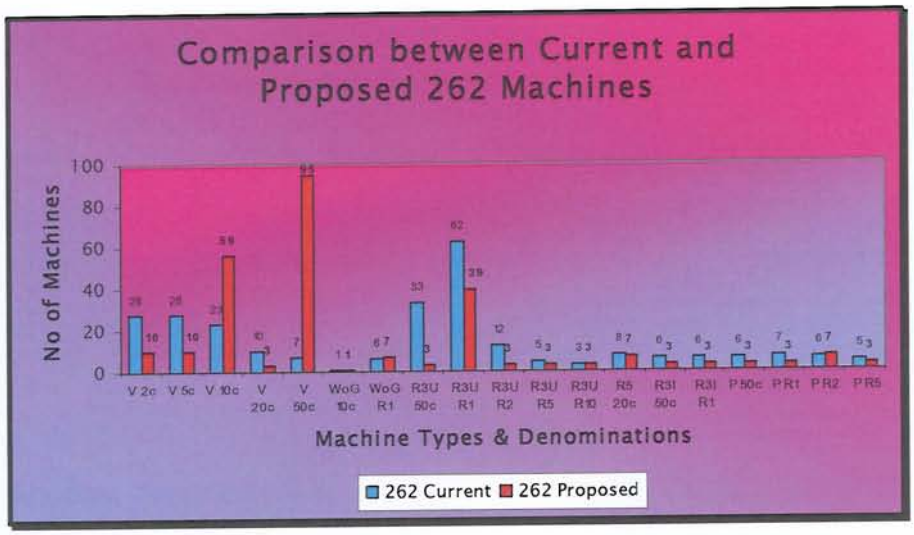


Figure 3: Comparison between current and proposed 262 machines

Source: T1h 262

When the current combination of 262 machines is compared to the optimal solution generated, it is clear that virtually all combinations change in order to increase the win by R31.7 million.

The optimal solution for 270 machines generates a profit of R87.7 million:

Figure 4: Optimal solution for the different machine types and denominations (LP)

Source: T1c Linear Programming No Machines

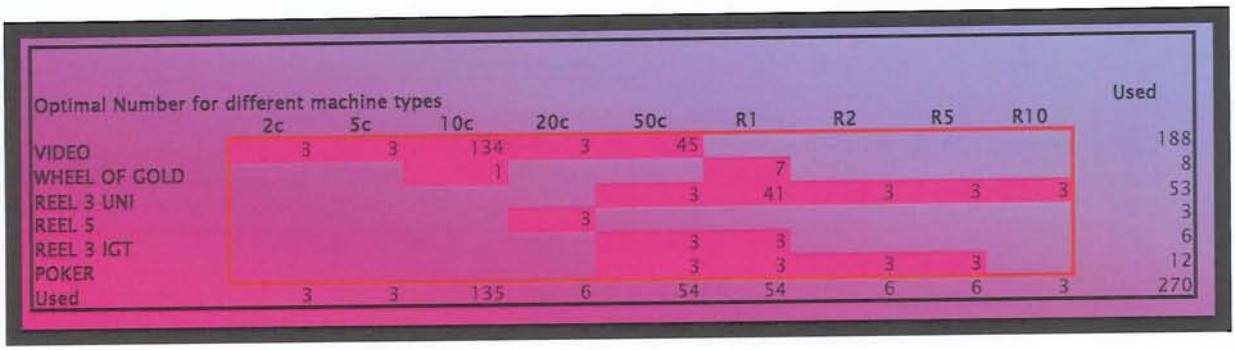
Thus by taking all constraints into account, optimal solutions were generated for the current 262 machines as well as the new number of 270 machines to compare the results. These optimal solutions generated wins of R84.7 million and R87.7 million respectively compared to the R53 million win of 2004 with the current composition of the 262 machines.

A Solver Table was used to determine different wins for different numbers of machines ranging from 270 to 300 and in this case, profits increased from R87.7 to R100.7 million.

The sensitivity report (see Appendix 6) indicates that the only two constraints with shadow prices that will lead to an improvement in the optimal win is the total number of machines and the maximum number of Wheel of Gold machines. The total number of machines can increase by the allowable increase of 36 machines to a maximum number of 306 machines to increase the win by R432 061.45 per machine. The total number of Wheel of Gold machines could increase by the allowable increase of 38 to a maximum of 46, increasing the win by R36 040.10 per additional machine. The negative shadow prices of the 2c, 5c, 20c, 50c, R1 and R2 denominations indicate that if their number constraint could decrease (only by their allowable decrease), the win could improve by the

shadow price per machine. None of the adjustable cells have zero values, thus the reduced cost acts as shadow prices and since all the shadow prices are negative, the only way to improve the win is to decrease the number of those machines within their allowable decreases, resulting in the win that will increase with reduced cost per machine.

Secondly, goal programming was applied to determine if it is possible to obtain a win of R100 million, taking certain goals (see Appendix 2) into account, the results of which were as follows (see Appendix 7a and 8):



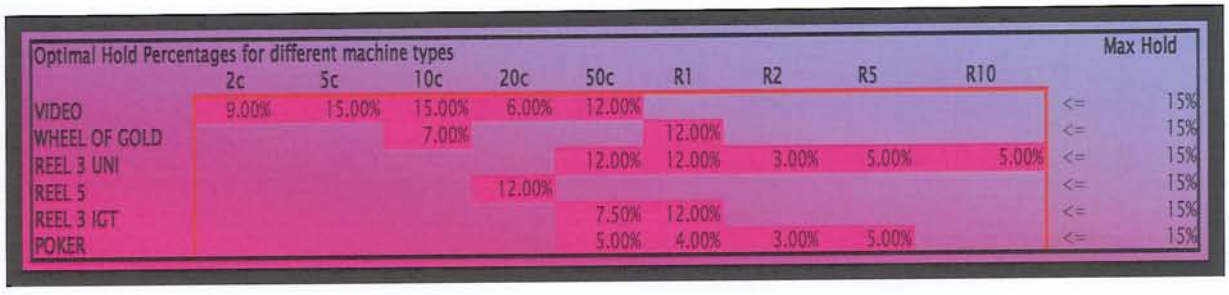
Optimal Number for different machine types	2c	5c	10c	20c	50c	R1	R2	R5	R10	Used
VIDEO	3	3	134	3	45					188
WHEEL OF GOLD			1			7				8
REEL 3 UNI					3	41	3	3	3	53
REEL 5				3						3
REEL 3 IGT					3	3				6
POKER					3	3	3	3		12
Used	3	3	135	6	54	54	6	6	3	270

Figure 5: Optimal solution for the different types and denomination machines (GP)

Source: T1d Goal Programming No Machines

With less stringent constraints, all the goals were met except the final goal of a maximum win of R100 million. The goal was missed by almost R6.6 million obtaining a maximum profit of R92 million, but this could only be obtained by ignoring some constraints (the minimum number of machines per denomination was not mentioned as a constraint). If the denomination constraints were adhered to, the goal would be missed by R12.3 million resulting in a profit of R87.6 (see Appendix 7b). The difference between the win of R87.7 million in the linear programming model and the R87.6 million in the goal programming model is due to different numbers of 10c and 50c machines "forced" in the case of goal programming.

Thirdly, linear programming was utilised to obtain the hold percentages per machine that would ensure maximum wins, using the average daily turnover per machine type and denomination: (see Appendix 9 and 10)



Optimal Hold Percentages for different machine types	2c	5c	10c	20c	50c	R1	R2	R5	R10		Max Hold
VIDEO	9.00%	15.00%	15.00%	6.00%	12.00%					<=	15%
WHEEL OF GOLD			7.00%			12.00%				<=	15%
REEL 3 UNI					12.00%	12.00%	3.00%	5.00%	5.00%	<=	15%
REEL 5				12.00%						<=	15%
REEL 3 IGT					7.50%	12.00%				<=	15%
POKER					5.00%	4.00%	3.00%	5.00%		<=	15%

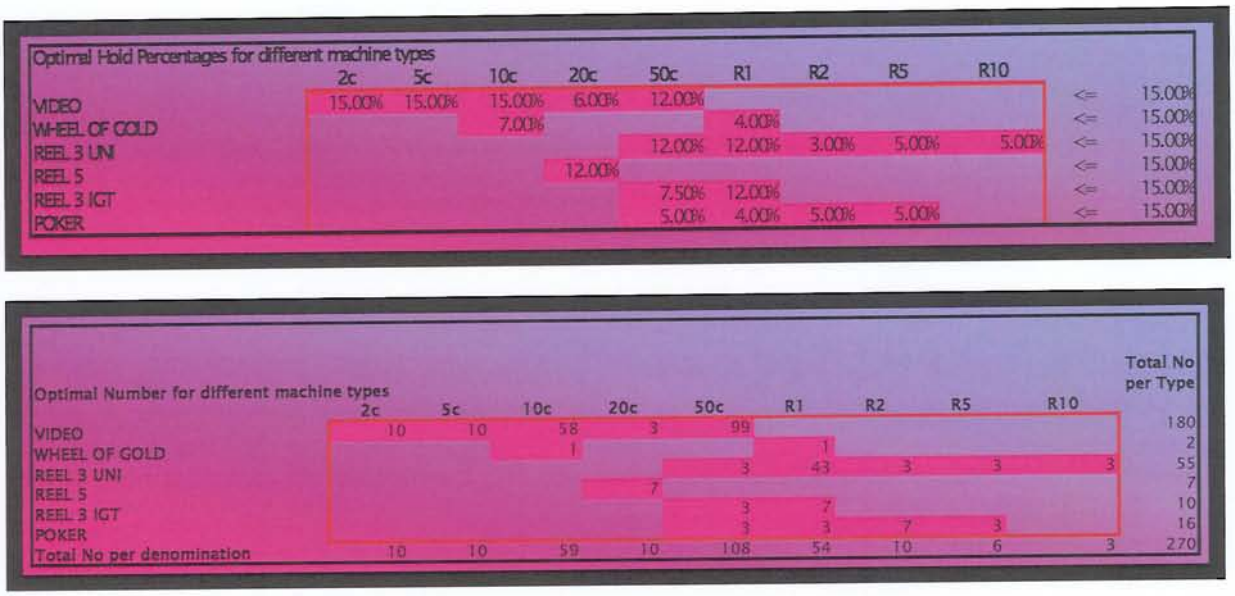
Figure 6: Optimal hold percentages for the different machines (LP)

Source: T1f Linear Programming hold percentages

The above percentages will ensure a maximum win per machine taking the prerequisite constraints into account (see Appendix 2c). A Solver Table indicates that if the maximum average percentage is increased from 8.5% to 11%, the win per day will increase from R11 578.20 to R12 782.23. No further increase in the win per day would result, even if the 11% were to increase to 15%.

The sensitivity report (see Appendix 11) also indicates that the win per day will increase with the shadow price for each percentage increase if it is within the allowable increase. None of the adjustable cells have a zero final value, and thus the reduced costs act as shadow prices. For those with negative reduced cost, the percentages could be decreased to within the allowable decrease, and for those with positive reduced cost the percentages could be increased within the allowable increase, to obtain a more profitable win.

Finally solver was used to calculate the optimal hold percentages and the optimal number of machines to generate the maximum profit (win). Due to two sets of variables, hold percentages and number of machines, multiplied with one another to obtain the maximum win, it had to be solved as a non- linear problem. The following results were obtained: (see Appendix 12)



Optimal Hold Percentages for different machine types

	2c	5c	10c	20c	50c	R1	R2	R5	R10		
VIDEO	15.00%	15.00%	15.00%	6.00%	12.00%					<=	15.00%
WHEEL OF GOLD			7.00%			4.00%				<=	15.00%
REEL 3 UNI					12.00%	12.00%	3.00%	5.00%	5.00%	<=	15.00%
REEL 5				12.00%						<=	15.00%
REEL 3 IGT					7.50%	12.00%				<=	15.00%
POKER					5.00%	4.00%	5.00%	5.00%		<=	15.00%

Optimal Number for different machine types

	2c	5c	10c	20c	50c	R1	R2	R5	R10	Total No per Type
VIDEO	10	10	58	3	99					180
WHEEL OF GOLD			1			1				2
REEL 3 UNI					3	43	3	3	3	55
REEL 5				7						7
REEL 3 IGT					3	7				10
POKER					3	3	7	3		16
Total No per denomination	10	10	59	10	108	54	10	6	3	270

Figure 7: Optimal hold percentages and optimal number of machines

Source: T1g Linear Programming hold percentages & No Machines

This solution generates a maximum profit of R123.9 million taking all the constraints of the machines and the hold percentages into account.

CONCLUSION

The maximum profit to be obtained with 270 machines, taking into account all the constraints (see Appendix 2) of machine denominations, machine types and the constraints on hold percentages, will result in a maximum win of R123.9 million. This can only be increased if some constraints are lifted. However, according to the solver table, the win can increase to R140.5 million, without changing the constraints, if the number of machines is increased to 300.

When comparing the combination of 270 machines utilising the current hold percentage to the combination where the optimal hold percentages were used, the following can be observed:

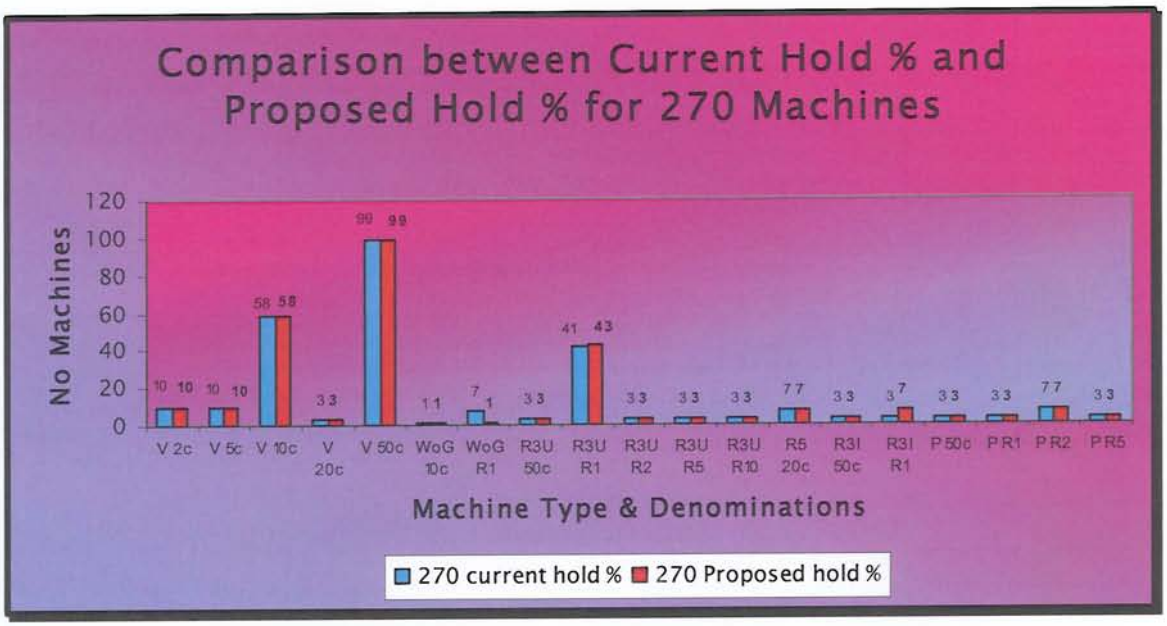


Figure 8: Comparison between current hold % and proposed hold % for 270 machines

Source: T1h 270

The Wheel of Gold R1 denominations changed from seven machines to one, the Reel three Uni for the R1 denominations changed from 41 to 43 machines and the Reel three IGT R1 denominations from three to seven machines. These changes result in an increase of R36.7 million.

4.2. QUEUING

The following determinations resulted:

From the Queuing model for an exponential distribution for service times and interarrival times for more than one server (see Appendix 13), it has been determined that, with the two servers in total, one at each of the two locations, the expected time that customers will wait in the queue is 24 seconds and the expected time in the system is 1 minute and 1.5 seconds. The expected number of customers in the queue is 0.8 and in the system 2.1. The total cost amounts to R282.20 per minute representing the cost of the facility (the average salary of the number of clerks (servers) and one supervisor per cash desk location per minute) and the waiting cost being interpreted as the average revenue lost per minute due to clients not being at the slot machines.

A sensitivity analysis performed with a data table shows that the optimal number of servers would be four in total at the two locations, with the expected time in the system being 38 seconds, the expected time in the queue half a second while a minimum cost was R186.76 per minute. This equates to the current situation. This figure is, however, misleading due to the fact that the average salaries were calculated per minute. Service staff are, however, not paid per minute but per shift, irrespective of their idle time whereas supervisors are paid monthly. Thus irrespective of whether there are one or two supervisors on duty, their salary cost per month will be the same and therefore it is a better option to have two locations available. The cashiers however are paid per shift and thus it will be more cost effective to reduce the number of cashiers per shift. When four servers are utilised the utilisation is only 31.25% vs the 62.5% utilisation of two servers.

The probability that more than five customers are in the queue where two servers are operating at two locations is 2.87% and the probability that customers need to wait longer than half a second altogether is 64.06%.

Notwithstanding the seemingly good statistics, it is impossible to decrease the number of servers to one as seen in the sensitivity report drawn from data table not being able to do the calculation. This is confirmed with the 200 simulations for one server done 10 times (see Appendix 14), resulting in a queue that simply cannot be handled by one server due to an average queue length of 11.4 customers and an average waiting time of 19.96 minutes. At a 95% confidence level, the average queue length is 3.69 and the average waiting time 5.17 minutes.

If only one location with two servers are utilised the differences are as follows (see Appendix 15):

The expected time that customers will wait in the queue remains 24 seconds and the expected time being in the system remains 1 minute and 1.5 seconds. The expected number of customers in the queue remains 0.8 and 2.1 in the system. The total cost would amount to R280.21 vs R282.20 per minute.

A sensitivity analysis was done using a data table and showed that the optimal number of servers would still be four at the two locations, with the expected time in the system still being 38 seconds, the expected time in the queue still half a second and only the cost changing from R186.76 to R182.78 per minute. The cost of a supervisor per location is the only variable under discussion versus the convenience of service points at two different locations. Due to supervisors being monthly salaried staff, it is not going to make a difference unless the number of supervisors were decreased.

According to information obtained from the security system, it has been conservatively estimated that 50% of the customers visiting the Casino would visit the cash desk, with the mean service time remaining the same. It has also been assumed that the service time and the interarrival time during real peak times will remain exponentially distributed. Thus it has been estimated from the information obtained that seven customers would arrive at the cash desk per minute.

The M/M/s model has been applied (see Appendix 16) to determine the minimum number of servers at the two locations and it has been established that a minimum of five servers in total would be needed.

The expected time that customers will wait in the queue is 42 seconds and the expected time being in the system is 1 minute and 20 seconds. The expected number of customers in the queue is 4.9 and in the system 9.3. The total cost amounts to R1 278.45 per minute.

A sensitivity analysis performed using a data table, revealed that the optimal number of servers considering cost only would be eight at the two locations, yet only six service points are currently available. For six service points, the expected time in the system was 46 seconds, the expected time in the queue 8.8 seconds and the cost R758.32 per minute.

The probability that more than five customers are in the queue where five servers are operating at two locations is 31.75% and the probability that customers need to wait longer than half a second all together is 74.59%.

CONCLUSION

During peak times the Casino would need to make use of at least two servers, preferably at the two different locations for the customers' convenience. During real peak times, a minimum of five servers was needed at the two locations and it is recommended that the location in the secluded smoking area has two servers while the location servicing the non smoking area, the tables and another small smoking area should have three servers available.

5. RECOMMENDATIONS

NUMBER OF MACHINES:

If the configuration of the 270 machines and hold percentages, as determined by the non-linear programming solution, is used, an optimal profit of R123.9 million is generated. Thus it is possible to increase the profit by changing the mix of machines and the hold percentages. By utilising the model's "what if scenario's", options can be calculated by changing the number of machines or the hold percentages to find the different win possibilities.

NUMBER OF SERVERS AT THE CASH DESKS:

During normal peak times, one server per cash desk location will render excellent service to customers, minimising the time they spend in queues, while during exceptional peak times, five servers are needed, two in the smaller secluded smoking area and three in the bigger non smoking and smoking area which also includes the tables.

LIST OF SOURCES

Dreyer, H. 2005. Casino Controller, Casino Mykonos. Langebaan: Personal interview, 18 March 2005. (Tel: 022 – 707 6980)

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Fortuin, D. 2005. Security Manager, Casino Mykonos. Langebaan: Personal interview, 18 March 2005.

Hillier, F.S & Hillier, M.S. 2003. *Introduction to Management Science*. 2nd edition. McGraw-Hill/Irwin.

Kleingeld, F. 2005. Cash Desk Manager, Casino Mykonos. Langebaan: Personal interview, 12 March 2005.

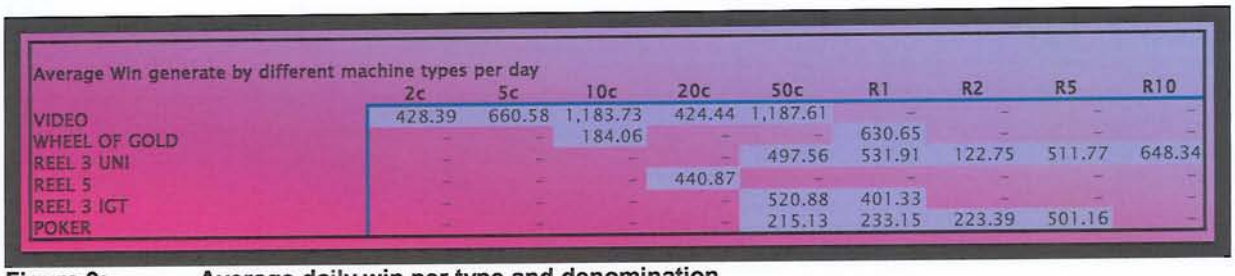
Robson, D. 2005. Casino Duty Manager, Casino Mykonos. Langebaan: Personal interview, 11 March 2005.

Strydom, G. 2005. Gaming Manager, Casino Mykonos. Langebaan: Personal interview, 18 March 2005.

APPENDICES

APPENDIX 1: DACOM INFORMATION

a.



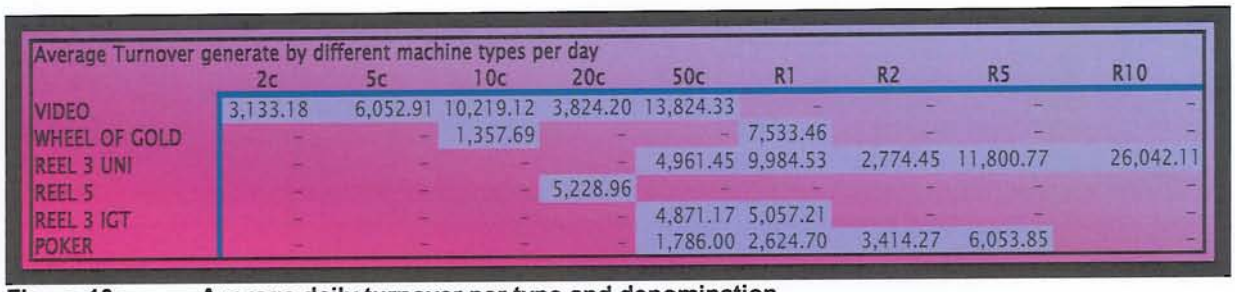
Average Win generate by different machine types per day

	2c	5c	10c	20c	50c	R1	R2	R5	R10
VIDEO	428.39	660.58	1,183.73	424.44	1,187.61	-	-	-	-
WHEEL OF GOLD	-	-	184.06	-	-	630.65	-	-	-
REEL 3 UNI	-	-	-	-	497.56	531.91	122.75	511.77	648.34
REEL 5	-	-	-	440.87	-	-	-	-	-
REEL 3 IGT	-	-	-	-	520.88	401.33	-	-	-
POKER	-	-	-	-	215.13	233.15	223.39	501.16	-

Figure 9: Average daily win per type and denomination

Source: T1a Linear Programming No Machines and Dacom System

b.



Average Turnover generate by different machine types per day

	2c	5c	10c	20c	50c	R1	R2	R5	R10
VIDEO	3,133.18	6,052.91	10,219.12	3,824.20	13,824.33	-	-	-	-
WHEEL OF GOLD	-	-	1,357.69	-	-	7,533.46	-	-	-
REEL 3 UNI	-	-	-	-	4,961.45	9,984.53	2,774.45	11,800.77	26,042.11
REEL 5	-	-	-	5,228.96	-	-	-	-	-
REEL 3 IGT	-	-	-	-	4,871.17	5,057.21	-	-	-
POKER	-	-	-	-	1,786.00	2,624.70	3,414.27	6,053.85	-

Figure 10: Average daily turnover per type and denomination

Source: T1e Linear programming hold percentages and Dacom System

APPENDIX 27: CONSTRAINTS

Constraints as determined by management and the Gaming Board:

a. The following constraints must be adhered to in order to determine the number of machines:

General:

1. Maximum number of machines cannot exceed 270 due to the number of licences acquired.

Types:

2. There must be between 30% and 80% Video machines in total. Video machines are the most recent technology available and therefore it is preferred that the number of Video machines must be as high as possible.

3. There must be between two and eight Wheel of Gold machines in total with a minimum of one for each denomination. These machines operate on a progressive jackpot system and are played frequently by a small number of punters.

4. There are three different types of Reel machines, five Reels and IGT as well as UNI three Reels and the total maximum number of Reel machines are not allowed to exceed 40% of the number of machines. Being the dinosaurs of the slot machines, they have a decreasing attractiveness to punters. Reel machines are those machines where the three or five bars/reels need to be the same to pay out.

5. The total number of Poker machines cannot exceed 10% of the total number of machines. A limited number of punters prefer these machines.

6. The minimum number of each denomination of Video, Reel and Poker machines are three to ensure that there are representation of each kind and denomination.

Denominations:

7. The minimum number of 2c, 5c, 10c, 20c and R2 machines are a total of 10 of each denomination, while the minimum number for R5 machines is five. The number of lower denominations are more in demand than the expensive ones.

8. The minimum number of 50c and R1 machines are 20% of the total number of each denomination and the maximum 40%. These are the most popular machines.

9. The maximum number of R10 machines is three. Only a few punters prefer to play "big bucks" at a time.

b. The following goals were identified by management to determine the number of machines:

1. The number of machines must be exactly 270.

2. Video machines must be at least 30% of the total number of machines.

3. The total number of Reel machines may not exceed 40% of the total number of machines.

4. The total number of 50c and R1 machines must be as close as possible to 20% of the total number of machines

5. The number of Wheel of Gold machines may not exceed eight.

6. The total win as close as possible to R100 million.

The only constraint was that the minimum number of each denomination of the Video, different types of Reel and the Poker machines must be three and for the Wheel of Gold one.

c. The following constraints is applicable to the hold percentages:

1. The maximum hold per machine is 15%.

2. The average hold percentage must be between 6.5% to 8.5%.

3. The minimum and maximum hold percentages vary with the different denominations, the higher the denomination the lower the hold. Thus 2c varies between 9 – 15%, 5c between 8 – 15% 10c between 7 – 15%, 20c between 6 – 12%, 50c between 5 – 12%, R1 between 4 – 12%, R2 between 3 – 5%, R5 between 2 – 5% and R10 between 1 – 5%.

APPENDIX 3: DISTRIBUTION OF SERVICE AND INTERARRIVAL TIMES

Service Time	
Mean	0.61
Standard Error	0.05
Median	0.39
Mode	1.15
Standard Deviation	0.63
Sample Variance	0.39
Kurtosis	9.67
Skewness	2.89
Range	3.45
Minimum	0.13
Maximum	3.58
Sum	84.86
Count	140.00

Figure 11: Statistics of service times

Source: T2 Service Times

Service times have an exponential distribution with a mean of $\frac{1}{\mu} = .61$ minutes, thus approximately μ =1.6 customers were serviced on average per minute.

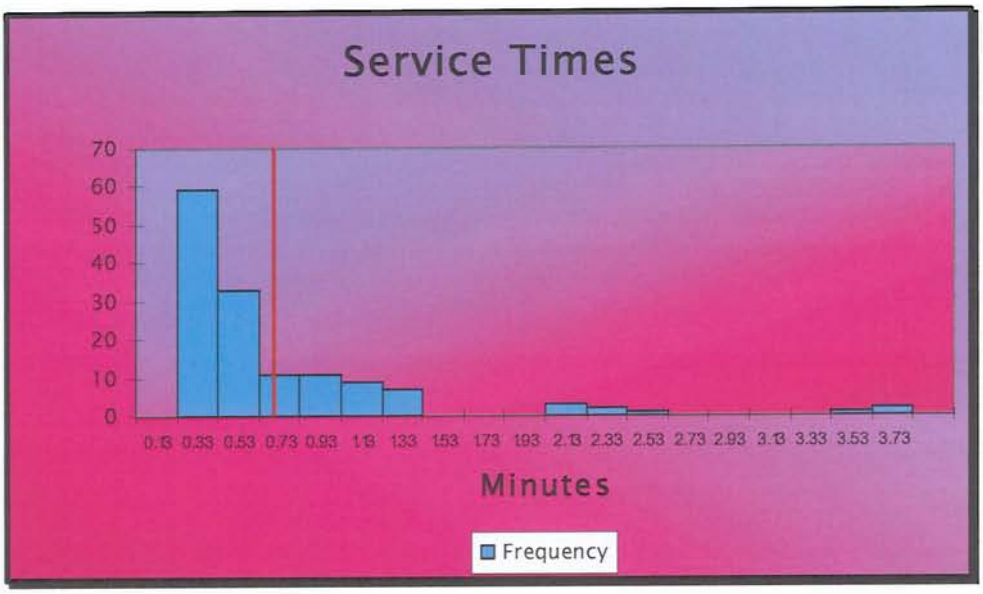


Figure 12: Service time distribution

Source: T2 Service Times

Interarrival Times	
Mean	0.49
Standard Error	0.04
Median	0.23
Mode	0.20
Standard Deviation	0.65
Sample Variance	0.42
Kurtosis	7.20
Skewness	2.45
Range	4.06
Minimum	0.01
Maximum	4.07
Sum	102.52
Count	211.00

Figure 13: Interarrival time statistics

Source: T2 Interarrival Times

Inter arrival times have an exponential distribution with a mean of $\frac{1}{\lambda} = .49$ thus approximately $\lambda = 2$ customers arrived on average per minute.

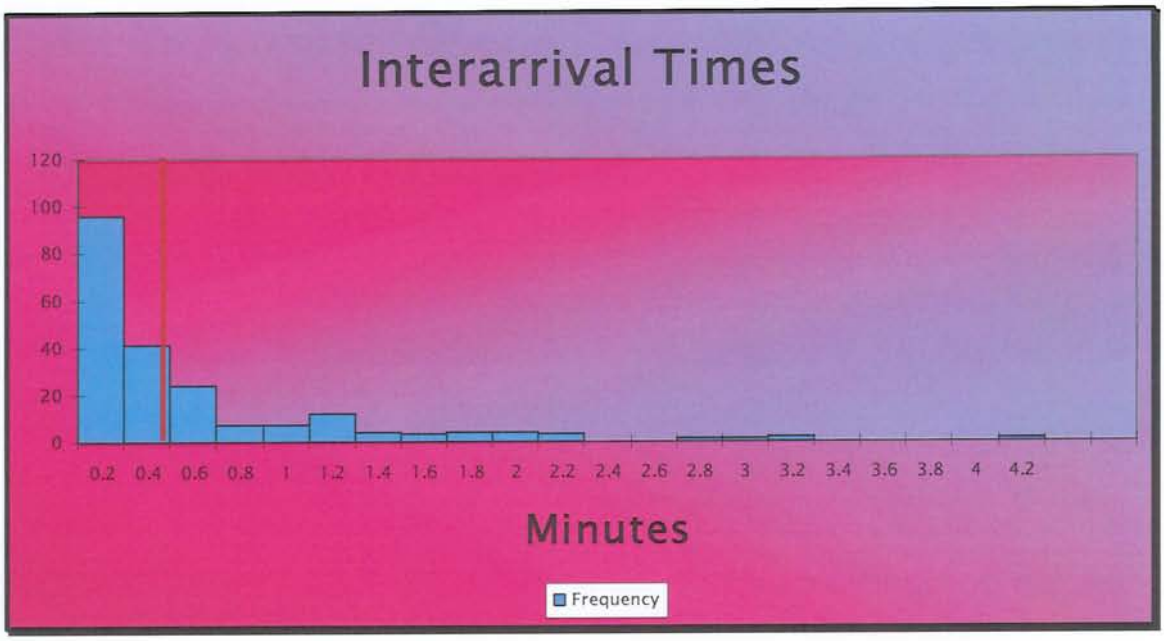


Figure 14: Distribution of interarrival times

Source: T2 Interarrival Times

APPENDIX 4: LINEAR PROGRAMMING : OPTIMAL NUMBER MACHINES

a. Current situation with 262 machines:

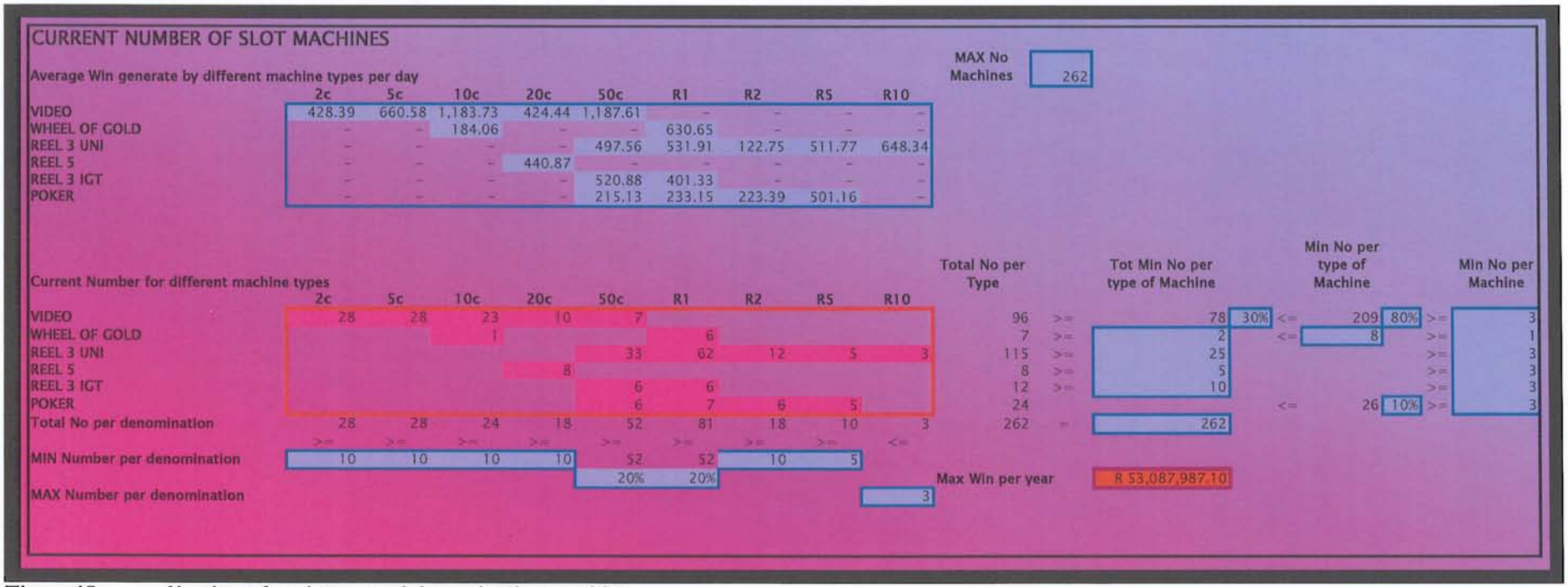


Figure 15: Number of each type and denomination machine

Source: 1a Current No Machines and Dacom system

b. Optimal solution generated with 262 machines:

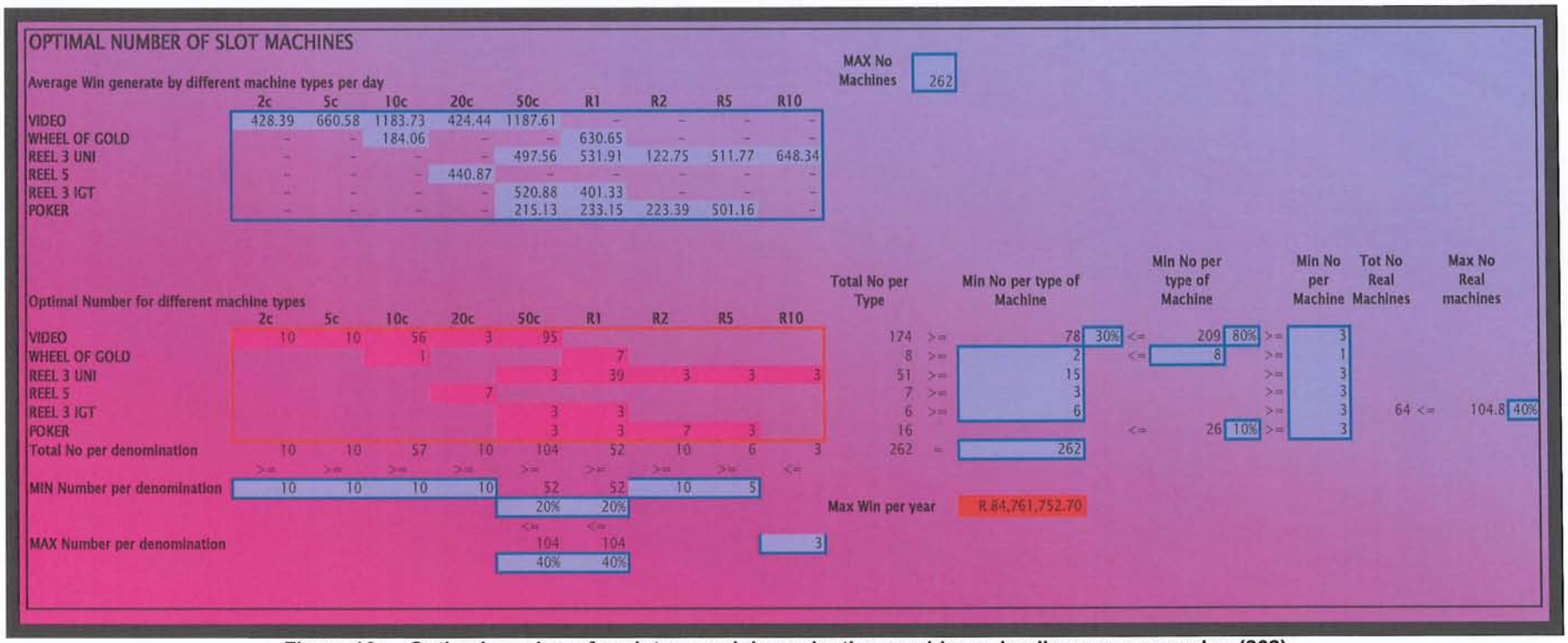


Figure 16: Optimal number of each type and denomination machine using linear programming (262)

Source: T1b Linear Programming No Machines

c. Optimal solution generated with 270 machines:

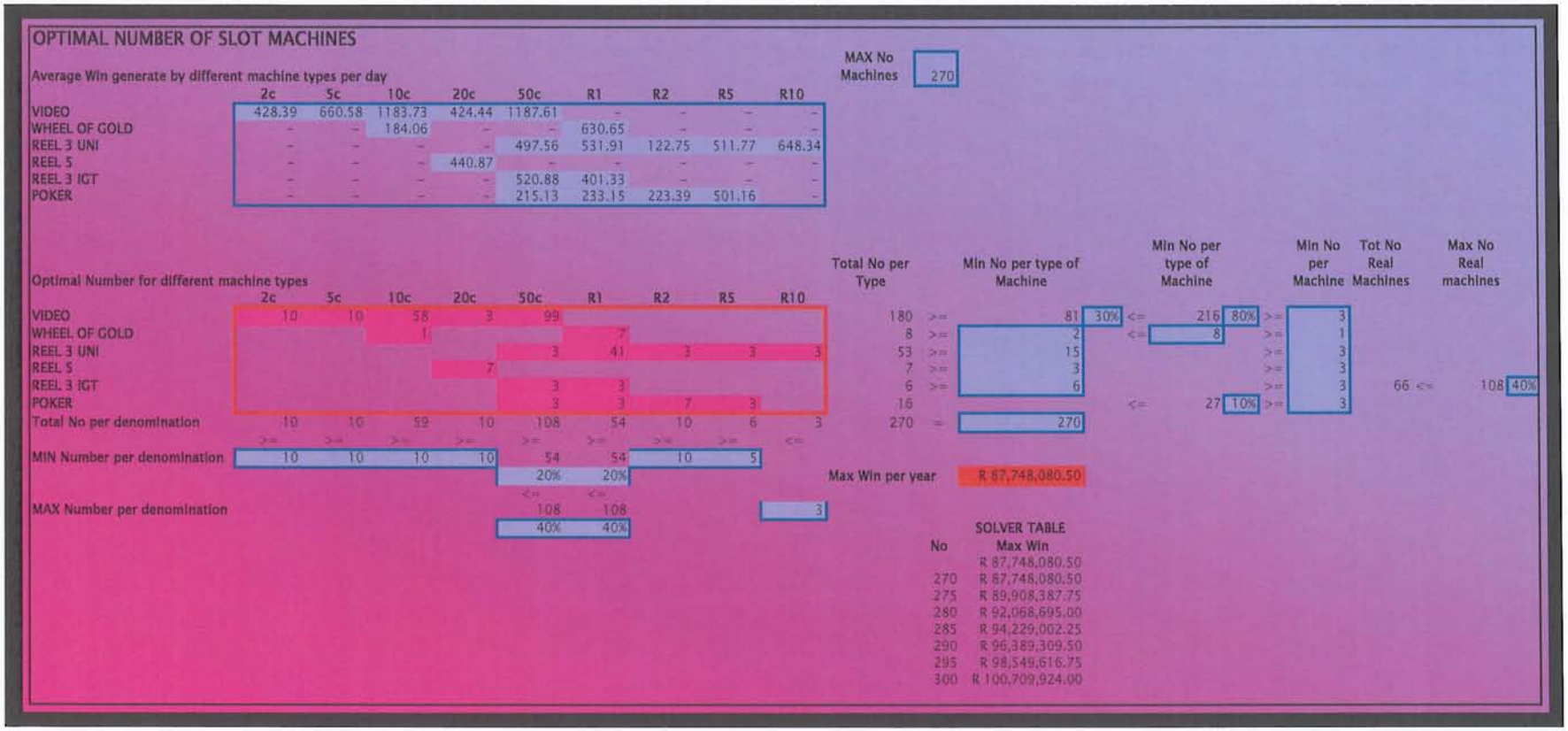


Figure 17: Optimal number of each type and denomination machine using Linear Programming(270)

Source: T1c Linear Programming No Machines

APPENDIX 5: ANSWER REPORT : OPTIMAL NUMBER OF MACHINES

Microsoft Excel 11.0 Answer Report
Worksheet: [T1c.xls]Linear programming No Machines
Report Created: 2005/04/04 10:03:35 PM

Target Cell (Max)

Cell	Name	Original Value	Final Value
$M$22	Max Win per year	R 87,748,080.50	R 87,748,080.50

Adjustable Cells

Cell	Name	Original Value	Final Value
$B$13	VIDEO 2c	10	10
$C$13	VIDEO 5c	10	10
$D$13	VIDEO 10c	58	58
$E$13	VIDEO 20c	3	3
$F$13	VIDEO 50c	99	99
$D$14	WHEEL OF GOLD 10c	1	1
$G$14	WHEEL OF GOLD R1	7	7
$F$15	REEL 3 UNI 50c	3	3
$G$15	REEL 3 UNI R1	41	41
$H$15	REEL 3 UNI R2	3	3
$I$15	REEL 3 UNI R5	3	3
$J$15	REEL 3 UNI R10	3	3
$E$16	REEL 5 20c	7	7
$F$17	REEL 3 IGT 50c	3	3
$G$17	REEL 3 IGT R1	3	3
$F$18	POKER 50c	3	3
$G$18	POKER R1	3	3
$H$18	POKER R2	7	7
$I$18	POKER R5	3	3

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
$B$19	Total No per denomination 2c	10	$B$19>=$B$21	Binding	0
$C$19	Total No per denomination 5c	10	$C$19>=$C$21	Binding	0
$D$19	Total No per denomination 10c	59	$D$19>=$D$21	Not Binding	49
$E$19	Total No per denomination 20c	10	$E$19>=$E$21	Binding	0
$F$19	Total No per denomination 50c	108	$F$19>=$F$21	Not Binding	54
$G$19	Total No per denomination R1	54	$G$19>=$G$21	Binding	0
$H$19	Total No per denomination R2	10	$H$19>=$H$21	Binding	0
$I$19	Total No per denomination R5	6	$I$19>=$I$21	Not Binding	1
$F$19	Total No per denomination 50c	108	$F$19<=$F$24	Binding	0
$G$19	Total No per denomination R1	54	$G$19<=$G$24	Not Binding	54
$J$19	Total No per denomination R10	3	$J$19<=$J$24	Binding	0
$K$13	VIDEO Total No per Type	180	$K$13<=$P$13	Not Binding	36
$K$14	WHEEL OF GOLD Total No per Type	8	$K$14<=$P$14	Binding	0
$K$13	VIDEO Total No per Type	180	$K$13>=$M$13	Not Binding	99
$K$14	WHEEL OF GOLD Total No per Type	8	$K$14>=$M$14	Not Binding	6
$K$15	REEL 3 UNI Total No per Type	53	$K$15>=$M$15	Not Binding	38
$K$16	REEL 5 Total No per Type	7	$K$16>=$M$16	Not Binding	4
$K$17	REEL 3 IGT Total No per Type	6	$K$17>=$M$17	Binding	0
$K$18	POKER Total No per Type	16	$K$18<=$P$18	Not Binding	11
$K$19	Total No per denomination Total No per Type	270	$K$19=$M$19	Binding	0
$T$17	>= Tot No Real Machines	66	$T$17<=$V$17	Not Binding	42
$B$13	VIDEO 2c	10	$B$13>=$S$13	Not Binding	7
$C$13	VIDEO 5c	10	$C$13>=$S$13	Not Binding	7
$D$13	VIDEO 10c	58	$D$13>=$S$13	Not Binding	55
$E$13	VIDEO 20c	3	$E$13>=$S$13	Binding	0
$F$13	VIDEO 50c	99	$F$13>=$S$13	Not Binding	96
$D$14	WHEEL OF GOLD 10c	1	$D$14>=$S$14	Binding	0
$E$16	REEL 5 20c	7	$E$16>=$S$16	Not Binding	4
$F$15	REEL 3 UNI 50c	3	$F$15>=$S$15	Binding	0
$G$15	REEL 3 UNI R1	41	$G$15>=$S$15	Not Binding	38
$H$15	REEL 3 UNI R2	3	$H$15>=$S$15	Binding	0
$I$15	REEL 3 UNI R5	3	$I$15>=$S$15	Binding	0
$J$15	REEL 3 UNI R10	3	$J$15>=$S$15	Binding	0
$F$17	REEL 3 IGT 50c	3	$F$17>=$S$17	Binding	0
$G$17	REEL 3 IGT R1	3	$G$17>=$S$17	Binding	0
$F$18	POKER 50c	3	$F$18>=$S$18	Binding	0
$G$18	POKER R1	3	$G$18>=$S$18	Binding	0
$H$18	POKER R2	7	$H$18>=$S$18	Not Binding	4
$I$18	POKER R5	3	$I$18>=$S$18	Binding	0
$G$14	WHEEL OF GOLD R1	7	$G$14>=$S$14	Not Binding	6

Figure 18: Answer report for the optimal number of machines (LP)

Source: T1c Answer Report No Machines

APPENDIX 6: SENSITIVITY REPORT : OPTIMAL NUMBER OF MACHINES

Microsoft Excel 11.0 Sensitivity Report
Worksheet: [T1c.xls]Linear programming No Machines
Report Created: 2005/04/04 10:03:35 PM

Adjustable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
$B$13	VIDEO 2c	10	0	156362.35	275699.1	1E+30
$C$13	VIDEO 5c	10	0	241111.7	190949.75	1E+30
$D$13	VIDEO 10c	58	0	432061.45	1416.2	190949.75
$E$13	VIDEO 20c	3	-5996.95	154920.6	5996.95	1E+30
$F$13	VIDEO 50c	99	0	433477.65	1E+30	1416.2
$D$14	WHEEL OF GOLD 10c	1	-400919.65	67181.9	400919.65	1E+30
$G$14	WHEEL OF GOLD R1	7	0	230187.25	1E+30	36040.1
$F$15	REEL 3 UNI 50c	3	-251868.25	181609.4	251868.25	1E+30
$G$15	REEL 3 UNI R1	41	0	194147.15	36040.1	47661.7
$H$15	REEL 3 UNI R2	3	-36733.6	44803.75	36733.6	1E+30
$I$15	REEL 3 UNI R5	3	-245265.4	186796.05	245265.4	1E+30
$J$15	REEL 3 UNI R10	3	-195417.35	236644.1	195417.35	1E+30
$E$16	REEL 5 20c	7	0	160917.55	271143.9	5996.95
$F$17	REEL 3 IGT 50c	3	-195694.75	190121.2	195694.75	1E+30
$G$17	REEL 3 IGT R1	3	0	146485.45	47661.7	195694.75
$F$18	POKER 50c	3	-354955.2	78522.45	354955.2	1E+30
$G$18	POKER R1	3	-109047.4	85099.75	109047.4	1E+30
$H$18	POKER R2	7	0	81537.35	350524.1	36733.6
$I$18	POKER R5	3	-249138.05	182923.4	249138.05	1E+30

Constraints

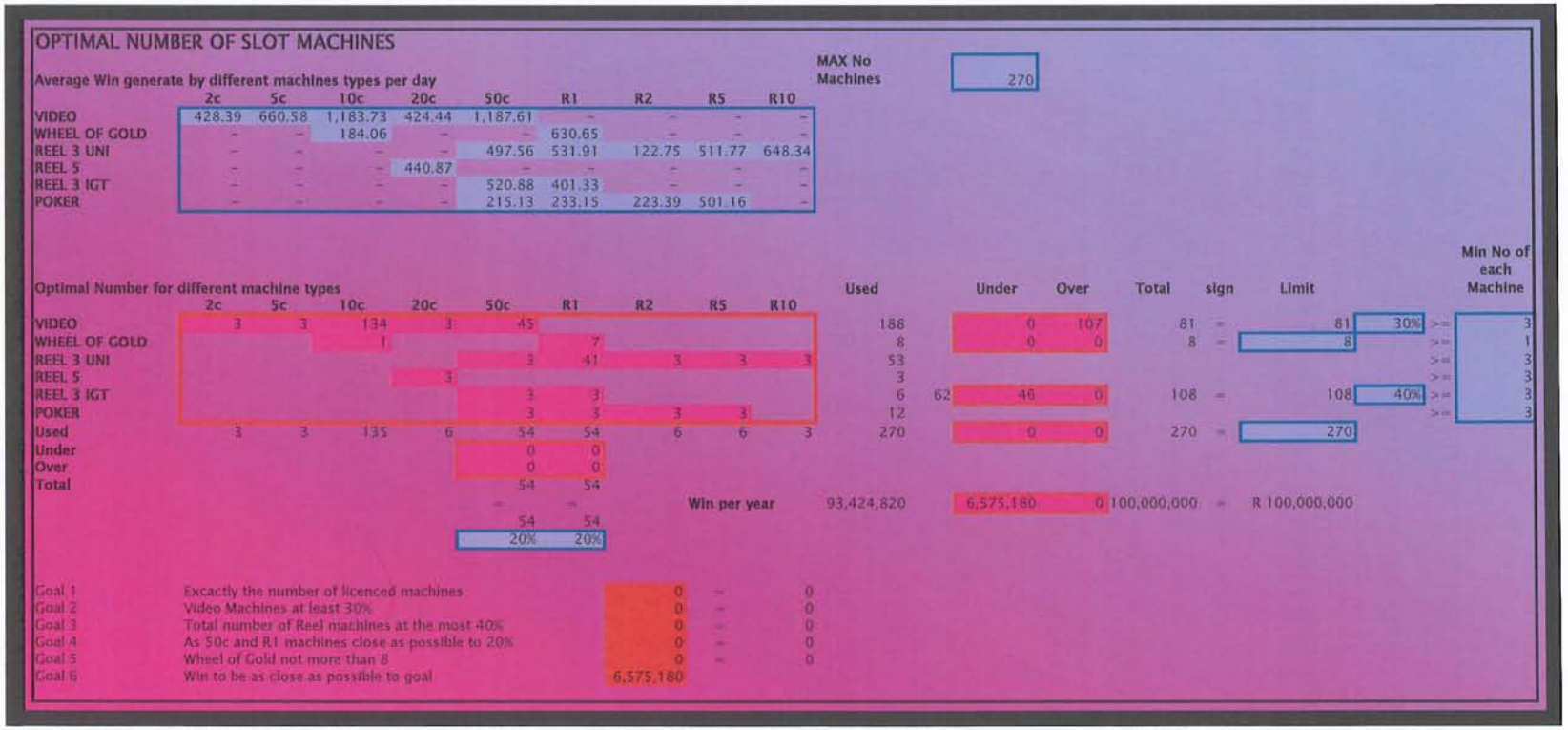
Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
$B$19	Total No per denomination 2c	10	-275699.1	10	49	7
$C$19	Total No per denomination 5c	10	-190949.75	10	49	7
$D$19	Total No per denomination 10c	59	0	10	49	1E+30
$E$19	Total No per denomination 20c	10	-271143.9	10	42	4
$F$19	Total No per denomination 50c	108	0	54	54	1E+30
$G$19	Total No per denomination R1	54	-237914.3	54	42	36
$H$19	Total No per denomination R2	10	-350524.1	10	11	4
$I$19	Total No per denomination R5	6	0	5	1	1E+30
$F$19	Total No per denomination 50c	108	1416.2	108	49	54
$G$19	Total No per denomination R1	54	0	108	1E+30	54
$J$19	Total No per denomination R10	3	0	3	1E+30	0
$K$13	VIDEO Total No per Type	180	0	216	1E+30	36
$K$14	WHEEL OF GOLD Total No per Type	8	36040.1	8	38	6
$K$13	VIDEO Total No per Type	180	0	81	99	1E+30
$K$14	WHEEL OF GOLD Total No per Type	8	0	2	6	1E+30
$K$15	REEL 3 UNI Total No per Type	53	0	15	38	1E+30
$K$16	REEL 5 Total No per Type	7	0	3	4	1E+30
$K$17	REEL 3 IGT Total No per Type	6	-47661.7	6	38	0
$K$18	POKER Total No per Type	16	0	27	1E+30	11
$K$19	Total No per denomination Total No per Type	270	432061.45	270	36	49
$T$17	<= Tot No Real Machines	66	0	108	1E+30	42

Figure 19: Sensitivity report for the optimal number of machines (LP)

Source: T1c Sensitivity Report No Machines

APPENDIX 7: GOAL PROGRAMMING : OPTIMAL NUMBER OF MACHINES

a. Without denomination constraints



OPTIMAL NUMBER OF SLOT MACHINES

MAX No Machines: 270

Average Win generate by different machines types per day

	2c	5c	10c	20c	50c	R1	R2	R5	R10
VIDEO	428.39	660.58	1,183.73	424.44	1,187.61	-	-	-	-
WHEEL OF GOLD	-	-	184.06	-	-	630.65	-	-	-
REEL 3 UNI	-	-	-	-	497.56	531.91	122.75	511.77	648.34
REEL 5	-	-	-	440.87	-	-	-	-	-
REEL 3 IGT	-	-	-	-	520.88	401.33	-	-	-
POKER	-	-	-	-	215.13	233.15	223.39	501.16	-

Optimal Number for different machine types

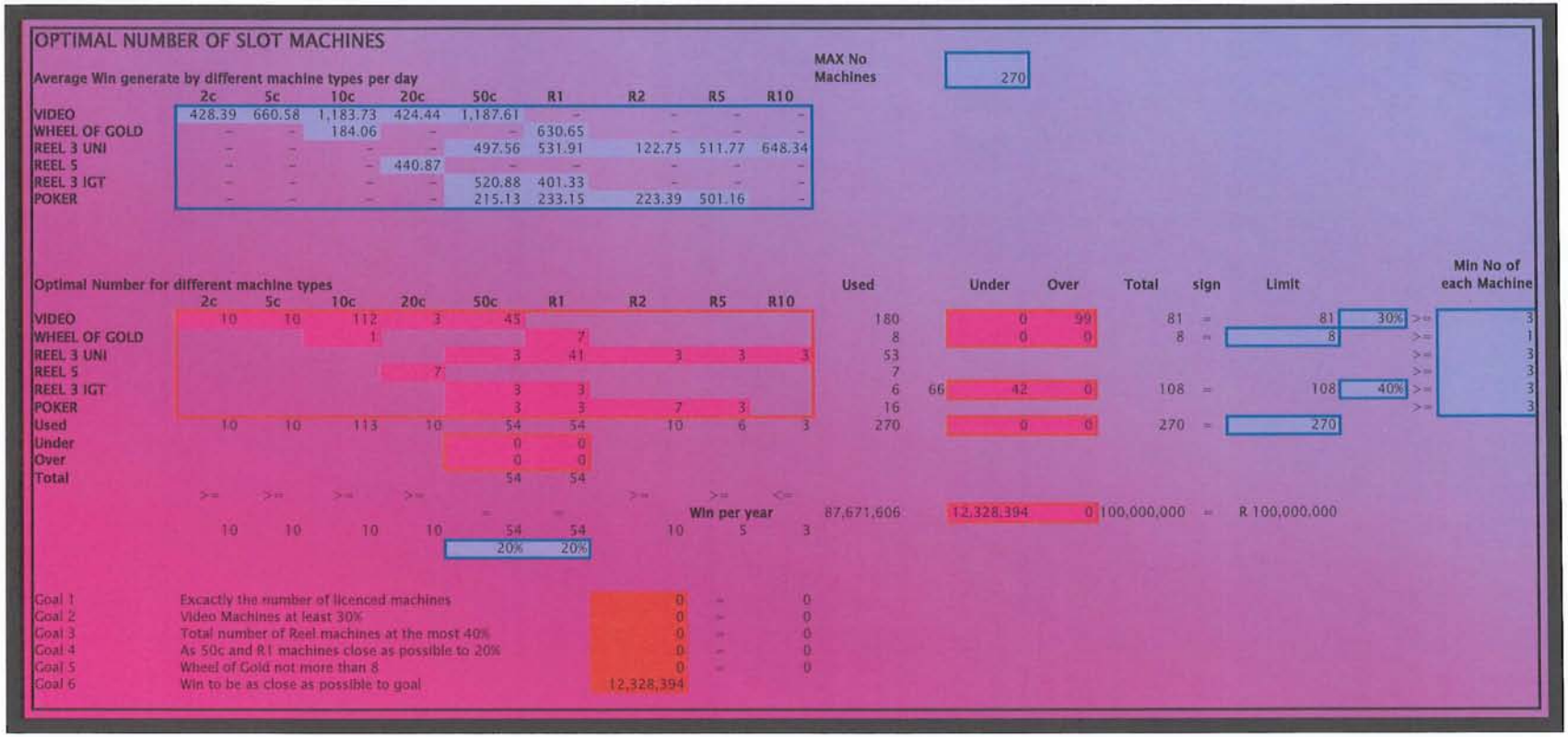
	2c	5c	10c	20c	50c	R1	R2	R5	R10	Used		Under	Over	Total	sign	Limit			Min No of each Machine
VIDEO	3	3	134	3	45					188		0	107	81	=	81	30%	>=	3
WHEEL OF GOLD			1			7				8		0	0	8	=	8		>=	1
REEL 3 UNI					3	41	3	3	3	53								>=	3
REEL 5				3						3								>=	3
REEL 3 IGT					3	3				6	62	46	0	108	=	108	40%	>=	3
POKER					3	3	3	3		12								>=	3
Used	3	3	135	6	54	54	6	6	3	270		0	0	270	=	270			
Under					0	0													
Over					0	0													
Total					54	54													
					=	=				Win per year		93,424,820	6,575,180	0	100,000,000	=	R 100,000,000		
					54	54													
					20%	20%													

Goal 1	Excactly the number of licenced machines	0	-	0
Goal 2	Video Machines at least 30%	0	-	0
Goal 3	Total number of Reel machines at the most 40%	0	-	0
Goal 4	As 50c and R1 machines close as possible to 20%	0	-	0
Goal 5	Wheel of Gold not more than 8	0	-	0
Goal 6	Win to be as close as possible to goal	6,575,180		

Figure 20: Optimal number of each type and denomination machine using goal programming

Source: T1d Goal Programming No Machines

b. With denomination constraints



OPTIMAL NUMBER OF SLOT MACHINES

MAX No Machines: 270

Average Win generate by different machine types per day

	2c	5c	10c	20c	50c	R1	R2	R5	R10
VIDEO	428.39	660.58	1,183.73	424.44	1,187.61	-	-	-	-
WHEEL OF GOLD	-	-	184.06	-	-	630.65	-	-	-
REEL 3 UNI	-	-	-	-	497.56	531.91	122.75	511.77	648.34
REEL 5	-	-	-	440.87	-	-	-	-	-
REEL 3 IGT	-	-	-	-	520.88	401.33	-	-	-
POKER	-	-	-	-	215.13	233.15	223.39	501.16	-

Optimal Number for different machine types

	2c	5c	10c	20c	50c	R1	R2	R5	R10	Used		Under	Over	Total	sign	Limit		Min No of each Machine
VIDEO	10	10	112	3	45					180		0	99	81	=	81	30% >=	3
WHEEL OF GOLD			1			7				8		0	0	8	=	8	>=	1
REEL 3 UNI					3	41	3	3	3	53							>=	3
REEL 5				7						7							>=	3
REEL 3 IGT					3	3				6	66	42	0	108	=	108	40% >=	3
POKER					3	3	7	3		16							>=	3
Used	10	10	113	10	54	54	10	6	3	270		0	0	270	=	270		
Under					0	0												
Over					0	0												
Total					54	54												
	>=	>=	>=	>=	=	=	>=	>=	<=									
	10	10	10	10	54	54	10	5	3	Win per year		87,671,606	12,328,394	0	100,000,000	=	R 100,000,000	
					20%	20%												

Goal 1	Exactly the number of licenced machines	0	-	0
Goal 2	Video Machines at least 30%	0	-	0
Goal 3	Total number of Reel machines at the most 40%	0	-	0
Goal 4	As 50c and R1 machines close as possible to 20%	0	-	0
Goal 5	Wheel of Gold not more than 8	0	-	0
Goal 6	Win to be as close as possible to goal	12,328,394		

Figure 21: Optimal number of each type and denomination machine using goal programming

Source: T1e Goal Programming No Machines

APPENDIX 8: ANSWER REPORT : OPTIMAL NUMBER OF MACHINES

Microsoft Excel 11.0 Answer Report
Worksheet: [T1d.xls]Goal programming
Report Created: 2005/04/04 12:34:52 AM

Target Cell (Min)

Cell	Name	Original Value	Final Value
$H$34	Win to be as close as possible to goal	6,575,180	6,575,180

Adjustable Cells

Cell	Name	Original Value	Final Value
$B$14	VIDEO 2c	3	3
$C$14	VIDEO 5c	3	3
$D$14	VIDEO 10c	134	134
$E$14	VIDEO 20c	3	3
$F$14	VIDEO 50c	45	45
$D$15	WHEEL OF GOLD 10c	1	1
$G$15	WHEEL OF GOLD R1	7	7
$F$16	REEL 3 UNI 50c	3	3
$G$16	REEL 3 UNI R1	41	41
$H$16	REEL 3 UNI R2	3	3
$I$16	REEL 3 UNI R5	3	3
$J$16	REEL 3 UNI R10	3	3
$E$17	REEL 5 20c	3	3
$F$18	REEL 3 IGT 50c	3	3
$G$18	REEL 3 IGT R1	3	3
$F$19	POKER 50c	3	3
$G$19	POKER R1	3	3
$H$19	POKER R2	3	3
$I$19	POKER R5	3	3
$F$21	Under 50c	0	0
$G$21	Under R1	0	0
$F$22	Over 50c	0	0
$G$22	Over R1	0	0
$M$14	VIDEO Under	0	0
$N$14	VIDEO Over	107	107
$M$15	WHEEL OF GOLD Under	0	0
$N$15	WHEEL OF GOLD Over	0	0
$M$18	REEL 3 IGT Under	46	46
$N$18	REEL 3 IGT Over	0	0
$M$20	Used Under	0	0
$N$20	Used Over	0	0
$M$24	Win per year Under	6,575,180	6,575,180
$N$24	Win per year Over	0	0

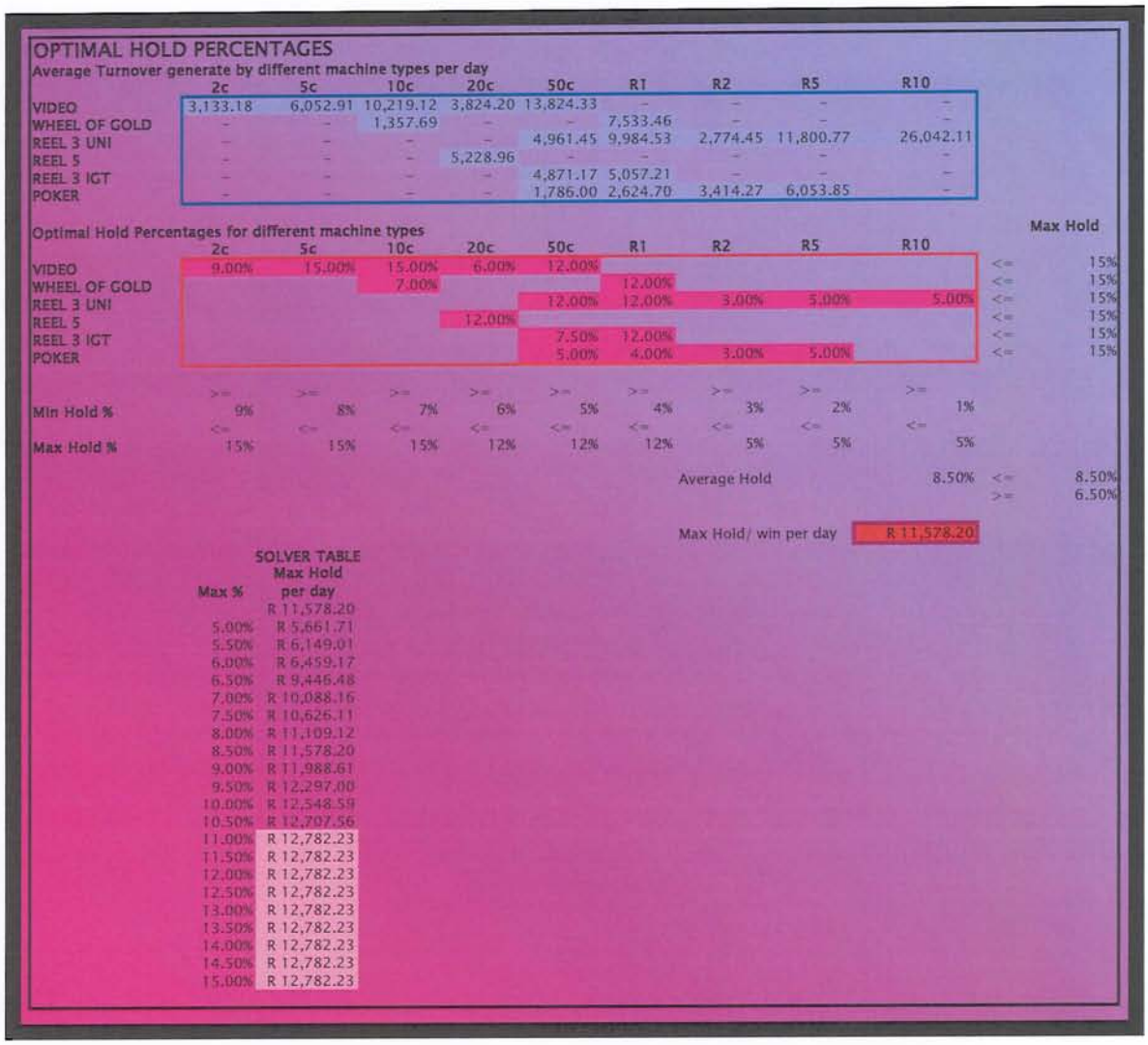
Constraints

Cell	Name	Cell Value	Formula	Status	Slack
$F$23	Total 50c	54	$F$23=$F$25	Binding	0
$G$23	Total R1	54	$G$23=$G$25	Binding	0
$H$29	Exactly the number of licenced machines	0	$H$29=$J$29	Binding	0
$H$30	Video Machines at least 30%	0	$H$30=$J$30	Binding	0
$H$31	Total number of Reel machines at the most 40%	0	$H$31=$J$31	Binding	0
$H$32	As 50c and R1 machines close as possible to 20%	0	$H$32=$J$32	Binding	0
$H$33	Wheel of Gold not more than 8	0	$H$33=$J$33	Binding	0
$O$14	VIDEO Total	81	$O$14=$Q$14	Binding	0
$O$15	WHEEL OF GOLD Total	8	$O$15=$Q$15	Binding	0
$O$18	REEL 3 IGT Total	108	$O$18=$Q$18	Binding	0
$O$20	Used Total	270	$O$20=$Q$20	Binding	0
$O$24	Win per year Total	100,000,000	$O$24=$Q$24	Binding	0
$B$14	VIDEO 2c	3	$B$14>=$T$14	Binding	0
$C$14	VIDEO 5c	3	$C$14>=$T$14	Binding	0
$D$14	VIDEO 10c	134	$D$14>=$T$14	Not Binding	131
$E$14	VIDEO 20c	3	$E$14>=$T$14	Binding	0
$F$14	VIDEO 50c	45	$F$14>=$T$14	Not Binding	42
$D$15	WHEEL OF GOLD 10c	1	$D$15>=$T$15	Binding	0
$E$17	REEL 5 20c	3	$E$17>=$T$17	Binding	0
$F$16	REEL 3 UNI 50c	3	$F$16>=$T$16	Binding	0
$G$16	REEL 3 UNI R1	41	$G$16>=$T$16	Not Binding	38
$H$16	REEL 3 UNI R2	3	$H$16>=$T$16	Binding	0
$I$16	REEL 3 UNI R5	3	$I$16>=$T$16	Binding	0
$J$16	REEL 3 UNI R10	3	$J$16>=$T$16	Binding	0
$F$18	REEL 3 IGT 50c	3	$F$18>=$T$18	Binding	0
$G$18	REEL 3 IGT R1	3	$G$18>=$T$18	Binding	0
$F$19	POKER 50c	3	$F$19>=$T$19	Binding	0
$G$19	POKER R1	3	$G$19>=$T$19	Binding	0
$H$19	POKER R2	3	$H$19>=$T$19	Binding	0
$I$19	POKER R5	3	$I$19>=$T$19	Binding	0
$G$15	WHEEL OF GOLD R1	7	$G$15>=$T$15	Not Binding	6

Figure 22: Answer report for the optimal number of machines (GP)

Source: T1d Answer Report Goal Programming

APPENDIX 9: LINEAR PROGRAMMING : OPTIMAL HOLD PERCENTAGES



OPTIMAL HOLD PERCENTAGES

Average Turnover generate by different machine types per day

	2c	5c	10c	20c	50c	R1	R2	R5	R10
VIDEO	3,133.18	6,052.91	10,219.12	3,824.20	13,824.33	-	-	-	-
WHEEL OF GOLD	-	-	1,357.69	-	-	7,533.46	-	-	-
REEL 3 UNI	-	-	-	-	4,961.45	9,984.53	2,774.45	11,800.77	26,042.11
REEL 5	-	-	-	5,228.96	-	-	-	-	-
REEL 3 IGT	-	-	-	-	4,871.17	5,057.21	-	-	-
POKER	-	-	-	-	1,786.00	2,624.70	3,414.27	6,053.85	-

Optimal Hold Percentages for different machine types

	2c	5c	10c	20c	50c	R1	R2	R5	R10		Max Hold
VIDEO	9.00%	15.00%	15.00%	6.00%	12.00%					<=	15%
WHEEL OF GOLD			7.00%			12.00%				<=	15%
REEL 3 UNI					12.00%	12.00%	3.00%	5.00%	5.00%	<=	15%
REEL 5				12.00%						<=	15%
REEL 3 IGT					7.50%	12.00%				<=	15%
POKER					5.00%	4.00%	3.00%	5.00%		<=	15%
	>=	>=	>=	>=	>=	>=	>=	>=	>=		
Min Hold %	9%	8%	7%	6%	5%	4%	3%	2%	1%		
	<=	<=	<=	<=	<=	<=	<=	<=	<=		
Max Hold %	15%	15%	15%	12%	12%	12%	5%	5%	5%		

Average Hold 8.50% <= 8.50%
>= 6.50%

Max Hold/ win per day R 11,578.20

SOLVER TABLE

Max %	Max Hold per day
	R 11,578.20
5.00%	R 5,661.71
5.50%	R 6,149.01
6.00%	R 6,459.17
6.50%	R 9,446.48
7.00%	R 10,088.16
7.50%	R 10,626.11
8.00%	R 11,109.12
8.50%	R 11,578.20
9.00%	R 11,988.61
9.50%	R 12,297.00
10.00%	R 12,548.59
10.50%	R 12,707.56
11.00%	R 12,782.23
11.50%	R 12,782.23
12.00%	R 12,782.23
12.50%	R 12,782.23
13.00%	R 12,782.23
13.50%	R 12,782.23
14.00%	R 12,782.23
14.50%	R 12,782.23
15.00%	R 12,782.23

Figure 23: Optimal hold percentage per type & denomination of machines (LP)

Source: T1e Linear Programming hold percentages

APPENDIX10: ANSWER REPORT : OPTIMAL HOLD

Microsoft Excel 11.0 Answer Report
Worksheet: [T1f.xls]Linear Programming Hold %
Report Created: 2005/04/04 12:53:46 AM

Target Cell (Max)

Cell	Name	Original Value	Final Value
$J$28	Max Hold/ win per day	R 11,578.20	R 11,578.20

Adjustable Cells

Cell	Name	Original Value	Final Value
$B$13	VIDEO 2c	9.00%	9.00%
$C$13	VIDEO 5c	15.00%	15.00%
$D$13	VIDEO 10c	15.00%	15.00%
$E$13	VIDEO 20c	6.00%	6.00%
$F$13	VIDEO 50c	12.00%	12.00%
$D$14	WHEEL OF GOLD 10c	7.00%	7.00%
$G$14	WHEEL OF GOLD R1	12.00%	12.00%
$F$15	REEL 3 UNI 50c	12.00%	12.00%
$G$15	REEL 3 UNI R1	12.00%	12.00%
$H$15	REEL 3 UNI R2	3.00%	3.00%
$I$15	REEL 3 UNI R5	5.00%	5.00%
$J$15	REEL 3 UNI R10	5.00%	5.00%
$E$16	REEL 5 20c	12.00%	12.00%
$F$17	REEL 3 IGT 50c	7.50%	7.50%
$G$17	REEL 3 IGT R1	12.00%	12.00%
$F$18	POKER 50c	5.00%	5.00%
$G$18	POKER R1	4.00%	4.00%
$H$18	POKER R2	3.00%	3.00%
$I$18	POKER R5	5.00%	5.00%

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
$J$25	Average Hold <=	8.50%	$J$25<=$L$25	Binding	0
$J$25	Average Hold <=	8.50%	$J$25>=$L$26	Not Binding	2.00%
$B$13	VIDEO 2c	9.00%	$B$13<=$B$23	Not Binding	0.06
$B$13	VIDEO 2c	9.00%	$B$13>=$B$21	Binding	0.00%
$B$13	VIDEO 2c	9.00%	$B$13<=$L$13	Not Binding	0.06
$C$13	VIDEO 5c	15.00%	$C$13<=$L$13	Binding	0
$D$13	VIDEO 10c	15.00%	$D$13<=$L$13	Binding	0
$E$13	VIDEO 20c	6.00%	$E$13<=$L$13	Not Binding	0.06
$F$13	VIDEO 50c	12.00%	$F$13<=$L$13	Binding	0
$C$13	VIDEO 5c	15.00%	$C$13<=$C$23	Binding	0
$C$13	VIDEO 5c	15.00%	$C$13>=$C$21	Not Binding	7.00%
$D$13	VIDEO 10c	15.00%	$D$13<=$D$23	Binding	0
$D$14	WHEEL OF GOLD 10c	7.00%	$D$14<=$D$23	Not Binding	0.08
$D$13	VIDEO 10c	15.00%	$D$13>=$D$21	Not Binding	8.00%
$D$14	WHEEL OF GOLD 10c	7.00%	$D$14>=$D$21	Binding	0.00%
$D$14	WHEEL OF GOLD 10c	7.00%	$D$14<=$L$14	Not Binding	0.08
$E$13	VIDEO 20c	6.00%	$E$13<=$E$23	Not Binding	0.06
$E$13	VIDEO 20c	6.00%	$E$13>=$E$21	Binding	0.00%
$E$16	REEL 5 20c	12.00%	$E$16<=$E$23	Binding	0
$E$16	REEL 5 20c	12.00%	$E$16<=$L$16	Binding	0
$E$16	REEL 5 20c	12.00%	$E$16>=$E$21	Not Binding	6.00%
$F$13	VIDEO 50c	12.00%	$F$13<=$F$23	Binding	0
$F$13	VIDEO 50c	12.00%	$F$13>=$F$21	Not Binding	7.00%
$F$15	REEL 3 UNI 50c	12.00%	$F$15<=$F$23	Binding	0
$F$15	REEL 3 UNI 50c	12.00%	$F$15>=$F$21	Not Binding	7.00%
$F$15	REEL 3 UNI 50c	12.00%	$F$15<=$L$15	Binding	0
$G$15	REEL 3 UNI R1	12.00%	$G$15<=$L$15	Binding	0
$H$15	REEL 3 UNI R2	3.00%	$H$15<=$L$15	Not Binding	0.02
$I$15	REEL 3 UNI R5	5.00%	$I$15<=$L$15	Binding	0
$J$15	REEL 3 UNI R10	5.00%	$J$15<=$L$15	Binding	0
$F$17	REEL 3 IGT 50c	7.50%	$F$17<=$F$23	Not Binding	0.045
$F$18	POKER 50c	5.00%	$F$18<=$F$23	Not Binding	0.07
$F$17	REEL 3 IGT 50c	7.50%	$F$17>=$F$21	Not Binding	2.50%
$F$18	POKER 50c	5.00%	$F$18>=$F$21	Binding	0.00%
$F$17	REEL 3 IGT 50c	7.50%	$F$17<=$L$17	Not Binding	0.045
$G$17	REEL 3 IGT R1	12.00%	$G$17<=$L$17	Binding	0
$F$18	POKER 50c	5.00%	$F$18<=$L$18	Not Binding	0.07
$G$18	POKER R1	4.00%	$G$18<=$L$18	Not Binding	0.08
$H$18	POKER R2	3.00%	$H$18<=$L$18	Not Binding	0.02
$I$18	POKER R5	5.00%	$I$18<=$L$18	Binding	0
$G$14	WHEEL OF GOLD R1	12.00%	$G$14<=$L$14	Binding	0
$G$14	WHEEL OF GOLD R1	12.00%	$G$14<=$G$23	Binding	0
$G$15	REEL 3 UNI R1	12.00%	$G$15<=$G$23	Binding	0
$G$14	WHEEL OF GOLD R1	12.00%	$G$14>=$G$21	Not Binding	8.00%
$G$15	REEL 3 UNI R1	12.00%	$G$15>=$G$21	Not Binding	8.00%
$G$17	REEL 3 IGT R1	12.00%	$G$17<=$G$23	Binding	0
$G$18	POKER R1	4.00%	$G$18<=$G$23	Not Binding	0.08
$G$17	REEL 3 IGT R1	12.00%	$G$17>=$G$21	Not Binding	8.00%
$G$18	POKER R1	4.00%	$G$18>=$G$21	Binding	0.00%
$H$15	REEL 3 UNI R2	3.00%	$H$15<=$H$23	Not Binding	0.02
$H$15	REEL 3 UNI R2	3.00%	$H$15>=$H$21	Binding	0.00%
$H$18	POKER R2	3.00%	$H$18<=$H$23	Not Binding	0.02
$H$18	POKER R2	3.00%	$H$18>=$H$21	Binding	0.00%
$I$15	REEL 3 UNI R5	5.00%	$I$15<=$I$23	Binding	0
$I$15	REEL 3 UNI R5	5.00%	$I$15>=$I$21	Not Binding	3.00%
$I$18	POKER R5	5.00%	$I$18<=$I$23	Binding	0
$I$18	POKER R5	5.00%	$I$18>=$I$21	Not Binding	3.00%
$J$15	REEL 3 UNI R10	5.00%	$J$15<=$J$23	Binding	0
$J$15	REEL 3 UNI R10	5.00%	$J$15>=$J$21	Not Binding	4.00%

Figure 24: Answer report for optimal hold percentages (LP)

Source: T1e Answer Report hold percentages

APPENDIX 11: SENSITIVITY REPORT : OPTIMAL HOLD

Microsoft Excel 11.0 Sensitivity Report
Worksheet: [T1f.xls]Linear Programming Hold %
Report Created: 2005/04/04 12:53:47 AM

Adjustable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
$B$13	VIDEO 2c	9.00%	-173799.00%	3133.18	1737.99	1E+30
$C$13	VIDEO 5c	15.00%	118174.00%	6052.91	1E+30	1181.74
$D$13	VIDEO 10c	15.00%	534795.00%	10219.12	1E+30	5347.95
$E$13	VIDEO 20c	6.00%	-104697.00%	3824.2	1046.97	1E+30
$F$13	VIDEO 50c	12.00%	895316.00%	13824.33	1E+30	8953.16
$D$14	WHEEL OF GOLD 10c	7.00%	-351348.00%	1357.69	3513.48	1E+30
$G$14	WHEEL OF GOLD R1	12.00%	266229.00%	7533.46	1E+30	2662.29
$F$15	REEL 3 UNI 50c	12.00%	9028.00%	4961.45	1E+30	90.28
$G$15	REEL 3 UNI R1	12.00%	511336.00%	9984.53	1E+30	5113.36
$H$15	REEL 3 UNI R2	3.00%	-209672.00%	2774.45	2096.72	1E+30
$I$15	REEL 3 UNI R5	5.00%	692960.00%	11800.77	1E+30	6929.6
$J$15	REEL 3 UNI R10	5.00%	2117094.00%	26042.11	1E+30	21170.94
$E$16	REEL 5 20c	12.00%	35779.00%	5228.96	1E+30	357.79
$F$17	REEL 3 IGT 50c	7.50%	0.00%	4871.17	90.28	1046.97
$G$17	REEL 3 IGT R1	12.00%	18604.00%	5057.21	1E+30	186.04
$F$18	POKER 50c	5.00%	-308517.00%	1786	3085.17	1E+30
$G$18	POKER R1	4.00%	-224647.00%	2624.7	2246.47	1E+30
$H$18	POKER R2	3.00%	-145690.00%	3414.27	1456.9	1E+30
$I$18	POKER R5	5.00%	118268.00%	6053.85	1E+30	1182.68

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
$J$25	Average Hold <=	8.50%	9255223.00%	0.085	0.002368421	0.001315789
$J$25	Average Hold >=	8.50%	0.00%	0.065	0.02	1E+30

Figure 25: **Sensitivity report for the optimal hold percentages (LP)**

Source: T1e Sensitivity Report hold percentages

APPENDIX 12: LINEAR PROGRAMMING : OPTIMAL HOLD PERCENTAGES AND OPTIMAL NUMBER OF MACHINES

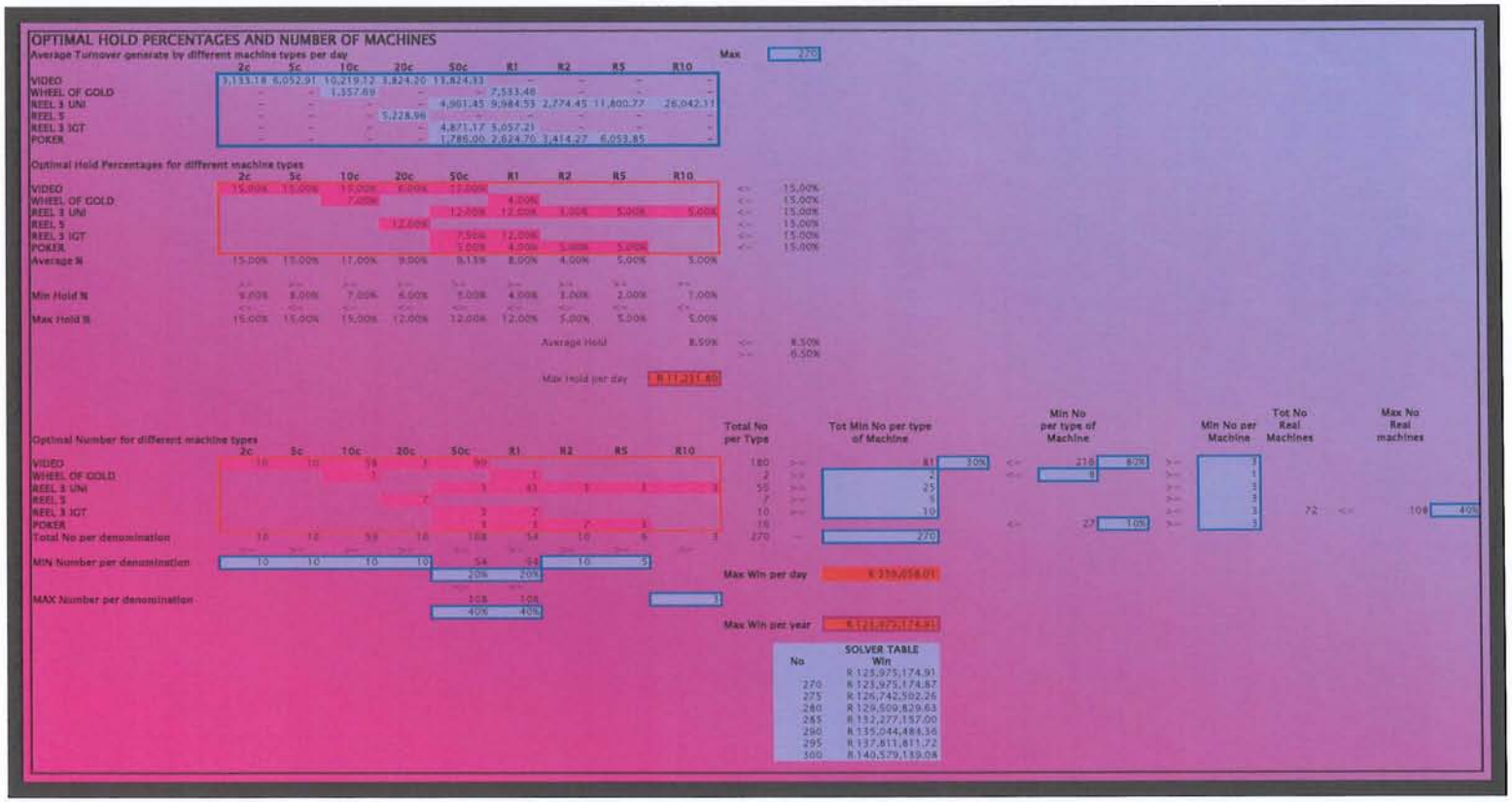
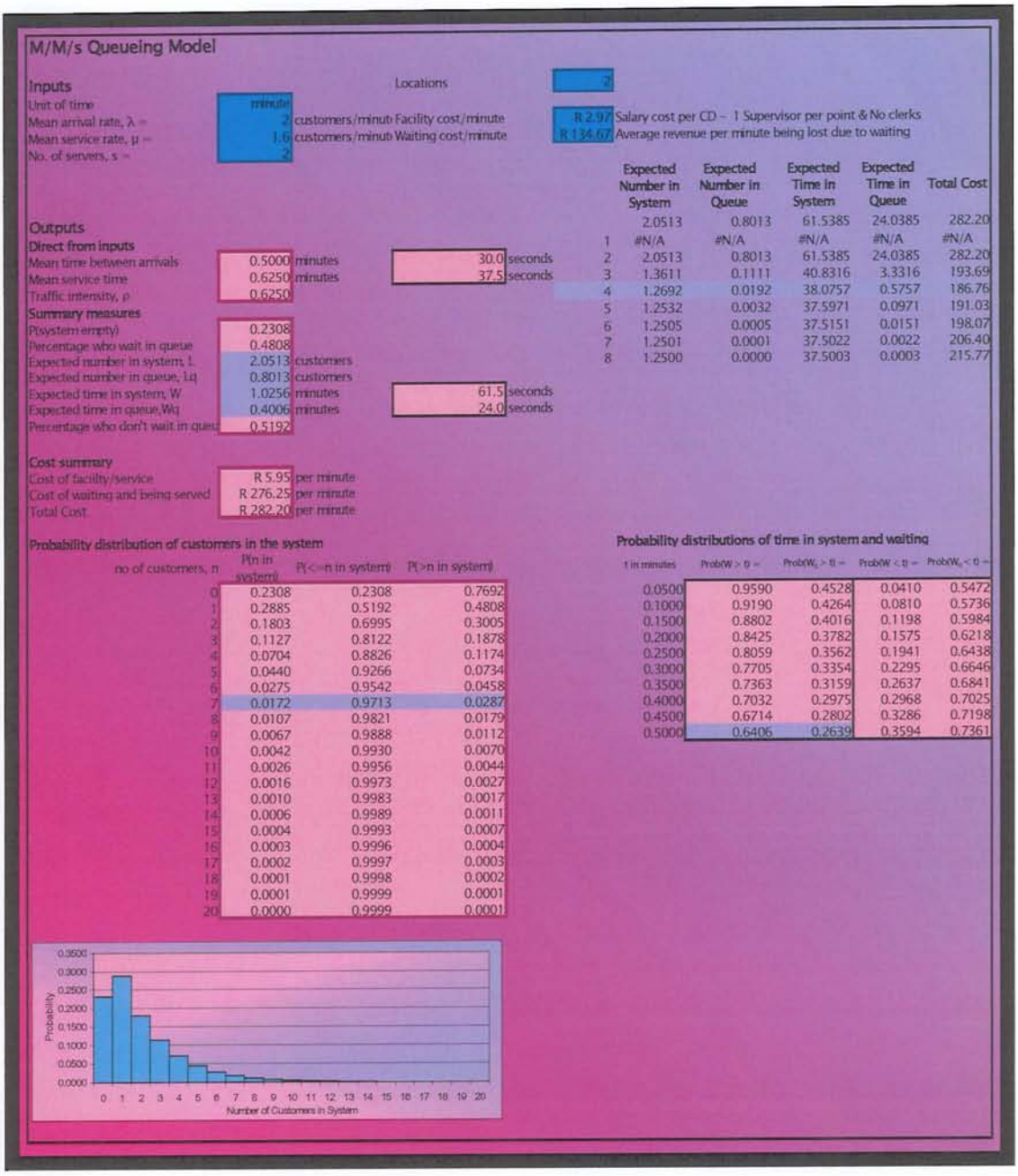


Figure 26: **Optimal hold percentages and number of machines generating maximum wins**

Source: T1f Optimal hold percentage and No machines

APPENDIX 13: M/M/s QUEUING FOR TWO SERVICE POINTS AT TWO LOCATIONS



M/M/s Queueing Model

Inputs

Locations: 2

Unit of time: minute
Mean arrival rate, λ = 2 customers/minute; Facility cost/minute
Mean service rate, μ = 1.6 customers/minute; Waiting cost/minute
No. of servers, s = 2

R 2.97 Salary cost per CD – 1 Supervisor per point & No clerks
R 134.67 Average revenue per minute being lost due to waiting

	Expected Number in System	Expected Number in Queue	Expected Time in System	Expected Time in Queue	Total Cost
	2.0513	0.8013	61.5385	24.0385	282.20
1	#N/A	#N/A	#N/A	#N/A	#N/A
2	2.0513	0.8013	61.5385	24.0385	282.20
3	1.3611	0.1111	40.8316	3.3316	193.69
4	1.2692	0.0192	38.0757	0.5757	186.76
5	1.2532	0.0032	37.5971	0.0971	191.03
6	1.2505	0.0005	37.5151	0.0151	198.07
7	1.2501	0.0001	37.5022	0.0022	206.40
8	1.2500	0.0000	37.5003	0.0003	215.77

Outputs

Direct from inputs

Mean time between arrivals	0.5000	minutes	30.0 seconds
Mean service time	0.6250	minutes	37.5 seconds
Traffic intensity, ρ	0.6250		

Summary measures

P(system empty)	0.2308		
Percentage who wait in queue	0.4808		
Expected number in system, L	2.0513	customers	
Expected number in queue, Lq	0.8013	customers	
Expected time in system, W	1.0256	minutes	61.5 seconds
Expected time in queue, Wq	0.4006	minutes	24.0 seconds
Percentage who don't wait in queu	0.5192		

Cost summary

Cost of facility/service	R 5.95	per minute
Cost of waiting and being served	R 276.25	per minute
Total Cost	R 282.20	per minute

Probability distribution of customers in the system

no of customers, n	P(n in system)	P(<=n in system)	P(>n in system)
0	0.2308	0.2308	0.7692
1	0.2885	0.5192	0.4808
2	0.1803	0.6995	0.3005
3	0.1127	0.8122	0.1878
4	0.0704	0.8826	0.1174
5	0.0440	0.9266	0.0734
6	0.0275	0.9542	0.0458
7	0.0172	0.9713	0.0287
8	0.0107	0.9821	0.0179
9	0.0067	0.9888	0.0112
10	0.0042	0.9930	0.0070
11	0.0026	0.9956	0.0044
12	0.0016	0.9973	0.0027
13	0.0010	0.9983	0.0017
14	0.0006	0.9989	0.0011
15	0.0004	0.9993	0.0007
16	0.0003	0.9996	0.0004
17	0.0002	0.9997	0.0003
18	0.0001	0.9998	0.0002
19	0.0001	0.9999	0.0001
20	0.0000	0.9999	0.0001

Probability distributions of time in system and waiting

t in minutes	Prob(W > t) =	Prob(Wq > t) =	Prob(W < t) =	Prob(Wq < t) =
0.0500	0.9590	0.4528	0.0410	0.5472
0.1000	0.9190	0.4264	0.0810	0.5736
0.1500	0.8802	0.4016	0.1198	0.5984
0.2000	0.8425	0.3782	0.1575	0.6218
0.2500	0.8059	0.3562	0.1941	0.6438
0.3000	0.7705	0.3354	0.2295	0.6646
0.3500	0.7363	0.3159	0.2637	0.6841
0.4000	0.7032	0.2975	0.2968	0.7025
0.4500	0.6714	0.2802	0.3286	0.7198
0.5000	0.6406	0.2639	0.3594	0.7361

Figure 27: M/M/s Queuing Model – Two servers, two locations

Source: T2 M/M/s

APPENDIX 14: SIMULATION FOR ONE SERVICE POINT

SIMULATION OF QUEING IF ONE SERVICE POINT IS AVAILABLE

Interarrival times — Mean: 0.49

Service time — 0.61 mean

RN	Inter-arrival time	Time of arrival	Time service starts	RN	Service time	Time service ends	Idle time server	Waiting time of client	Queue length	No
		0	0			0				0
0.51329	0.33	0.33	0.33	0.13933	1.20	1.53	0.33	0.00	0.00	1
0.87446	0.07	0.39	1.53	0.78768	0.15	1.67	0.00	1.14	1.00	2
0.72871	0.16	0.55	1.67	0.50646	0.41	2.09	0.00	1.13	2.00	3
0.88487	0.06	0.61	2.09	0.92648	0.05	2.14	0.00	1.48	3.00	4
0.34959	0.51	1.12	2.14	0.77688	0.15	2.29	0.00	1.01	4.00	5
0.06818	1.32	2.44	2.44	0.89826	0.07	2.50	0.15	0.00	0.00	6
0.89783	0.05	2.49	2.50	0.79863	0.14	2.64	0.00	0.01	1.00	7
0.68934	0.18	2.67	2.67	0.31473	0.71	3.38	0.03	0.00	0.00	8
0.38385	0.47	3.14	3.38	0.25264	0.84	4.22	0.00	0.24	1.00	9
0.47243	0.37	99.93	117.31	0.40754	0.55	117.86	0.00	17.37	29.00	190
0.88819	0.06	99.99	117.86	0.04711	1.86	119.72	0.00	17.86	30.00	191
0.88745	0.06	100.05	119.72	0.99105	0.01	119.72	0.00	19.67	31.00	192
0.19036	0.81	100.86	119.72	0.95290	0.03	119.75	0.00	18.86	31.00	193
0.62170	0.23	101.10	119.75	0.81932	0.12	119.88	0.00	18.66	32.00	194
0.01287	2.13	103.23	119.88	0.58395	0.33	120.20	0.00	16.65	32.00	195
0.46410	0.38	103.60	120.20	0.12679	1.26	121.46	0.00	16.60	32.00	196
0.37449	0.48	104.09	121.46	0.25006	0.85	122.31	0.00	17.38	33.00	197
0.02606	1.79	105.87	122.31	0.75372	0.17	122.48	0.00	16.44	29.00	198
0.41376	0.43	106.31	122.48	0.01539	2.55	125.03	0.00	16.18	30.00	199
0.31803	0.56	106.87	125.03	0.88839	0.07	125.10	0.00	18.16	30.00	200
Average	0.53	50.39	64.67		0.62	65.29	0.01	14.28	24.28	
Std Dev	0.57	30.42	35.60		0.64	35.57	0.07	6.27	12.05	
Max	3.06	106.87	125.03		3.88	125.10	0.87	22.01	39.00	
Min	0.00	0.33	0.33		0.00	1.53	0.00	0.00	0.00	

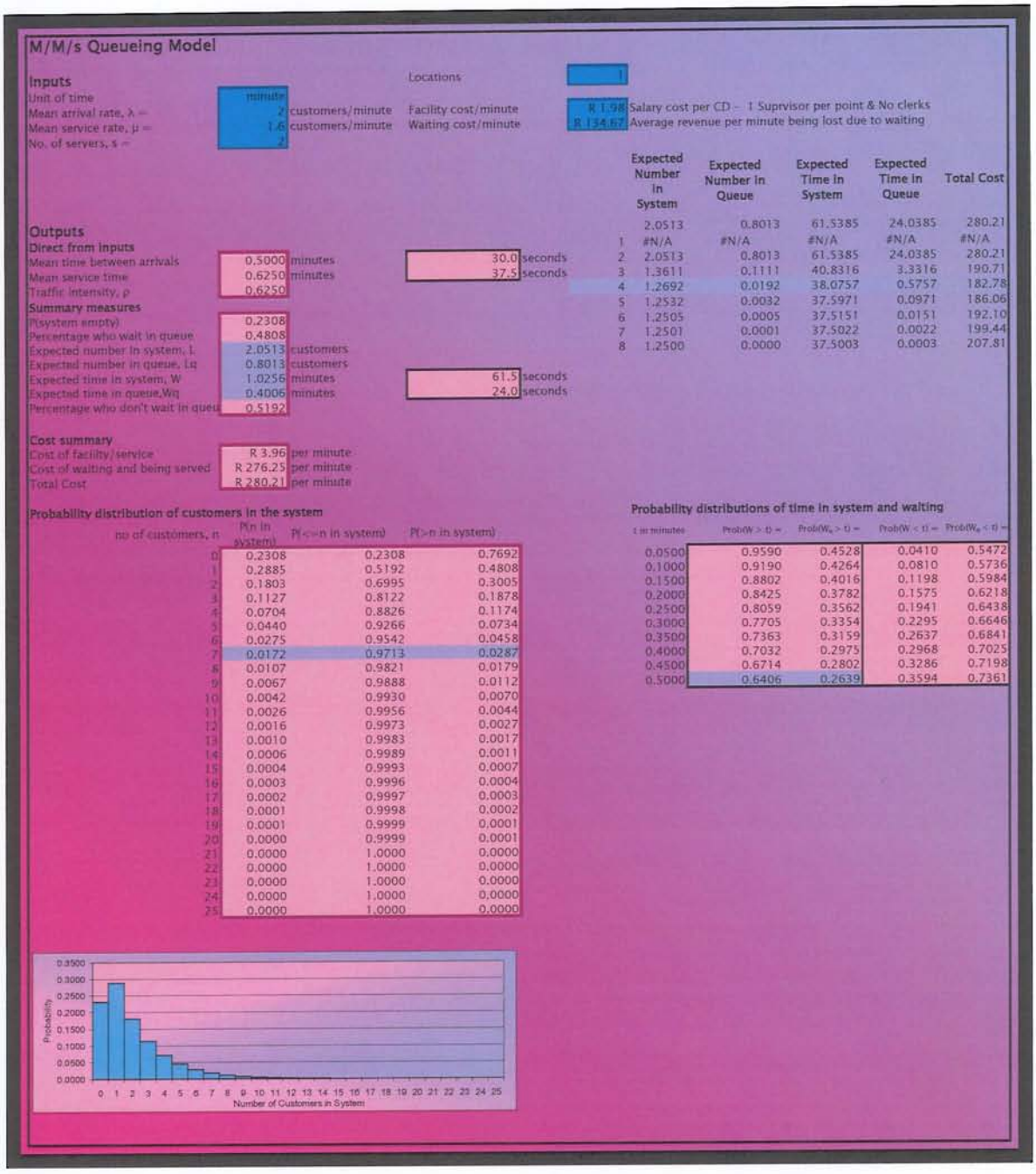
		Waiting time of client	Queue length
Simulation	1	14.28	24.28
	2	13.14	23.04
	3	3.95	7.22
	4	10.94	20.05
	5	13.51	23.43
	6	11.82	20.43
	7	18.02	29.68
	8	7.56	12.86
	9	16.22	24.89
	10	13.87	23.52

	Waiting time of client	Queue length
Mean	11.40	19.96
Standard Error	1.63	2.29
Median	13.32	23.23
Mode	#N/A	#N/A
Standard Deviation	5.15	7.23
Sample Variance	26.54	52.27
Kurtosis	-0.56	-0.62
Skewness	-0.73	-0.73
Range	15.53	22.46
Minimum	2.49	7.22
Maximum	18.02	29.68
Sum	113.97	199.64
Count	10	10
Confidence Level(95.0%)	3.69	5.17

Figure 28: Simulation using one service point

Source: T2b Simulation

APPENDIX 28: M/M/s QUEUING FOR TWO SERVICE POINTS AT ONE LOCATION



M/M/s Queueing Model

Inputs

Unit of time	minute	Locations	1	
Mean arrival rate, λ =	2 customers/minute	Facility cost/minute	R 1.98	Salary cost per CD – 1 Suprvisor per point & No clerks
Mean service rate, μ =	1.6 customers/minute	Waiting cost/minute	R 134.67	Average revenue per minute being lost due to waiting
No. of servers, s =	2			

Outputs

Direct from inputs

Mean time between arrivals	0.5000 minutes	30.0 seconds	
Mean service time	0.6250 minutes	37.5 seconds	
Traffic intensity, ρ	0.6250		

Summary measures

P(system empty)	0.2308		
Percentage who wait in queue	0.4808		
Expected number in system, L	2.0513 customers		
Expected number in queue, Lq	0.8013 customers		
Expected time in system, W	1.0256 minutes	61.5 seconds	
Expected time in queue,Wq	0.4006 minutes	24.0 seconds	
Percentage who don't wait in queu	0.5192		

Cost summary

Cost of facility/service	R 3.96	per minute
Cost of waiting and being served	R 276.25	per minute
Total Cost	R 280.21	per minute

	Expected Number in System	Expected Number in Queue	Expected Time in System	Expected Time in Queue	Total Cost
	2.0513	0.8013	61.5385	24.0385	280.21
1	#N/A	#N/A	#N/A	#N/A	#N/A
2	2.0513	0.8013	61.5385	24.0385	280.21
3	1.3611	0.1111	40.8316	3.3316	190.71
4	1.2692	0.0192	38.0757	0.5757	182.78
5	1.2532	0.0032	37.5971	0.0971	186.06
6	1.2505	0.0005	37.5151	0.0151	192.10
7	1.2501	0.0001	37.5022	0.0022	199.44
8	1.2500	0.0000	37.5003	0.0003	207.81

Probability distribution of customers in the system

no of customers, n	P(n in system)	P(<=n in system)	P(>n in system)
0	0.2308	0.2308	0.7692
1	0.2885	0.5192	0.4808
2	0.1803	0.6995	0.3005
3	0.1127	0.8122	0.1878
4	0.0704	0.8826	0.1174
5	0.0440	0.9266	0.0734
6	0.0275	0.9542	0.0458
7	0.0172	0.9713	0.0287
8	0.0107	0.9821	0.0179
9	0.0067	0.9888	0.0112
10	0.0042	0.9930	0.0070
11	0.0026	0.9956	0.0044
12	0.0016	0.9973	0.0027
13	0.0010	0.9983	0.0017
14	0.0006	0.9989	0.0011
15	0.0004	0.9993	0.0007
16	0.0003	0.9996	0.0004
17	0.0002	0.9997	0.0003
18	0.0001	0.9998	0.0002
19	0.0001	0.9999	0.0001
20	0.0000	0.9999	0.0001
21	0.0000	1.0000	0.0000
22	0.0000	1.0000	0.0000
23	0.0000	1.0000	0.0000
24	0.0000	1.0000	0.0000
25	0.0000	1.0000	0.0000

Probability distributions of time in system and waiting

t in minutes	Prob(W > t) =	Prob(W_q > t) =	Prob(W < t) =	Prob(W_q < t) =
0.0500	0.9590	0.4528	0.0410	0.5472
0.1000	0.9190	0.4264	0.0810	0.5736
0.1500	0.8802	0.4016	0.1198	0.5984
0.2000	0.8425	0.3782	0.1575	0.6218
0.2500	0.8059	0.3562	0.1941	0.6438
0.3000	0.7705	0.3354	0.2295	0.6646
0.3500	0.7363	0.3159	0.2637	0.6841
0.4000	0.7032	0.2975	0.2968	0.7025
0.4500	0.6714	0.2802	0.3286	0.7198
0.5000	0.6406	0.2639	0.3594	0.7361

Figure 29: M/M/s Queuing Model – Two servers, one location

Source: T3 M/M/s

APPENDIX 16: M/M/s QUEUING FOR REAL PEAK TIMES

M/M/s Queueing Model

Inputs

Unit of time	Minute		Locations	2	
Mean arrival rate, λ =	7	customers/Minute	Facility cost/Minute	R 4.45	Salary cost per CD - 1 Suprvisor per point & No clerks
Mean service rate, μ =	1.6	customers/Minute	Waiting cost/Minute	R 134.67	Average revenue per minute being lost due to waiting
No. of servers, s =	5				

Outputs

Direct from inputs

			Seconds
Mean time between arrivals	0.1429	Minutes	8.6
Mean service time	0.6250	Minutes	37.5
Traffic intensity, ρ	0.8750		

Summary measures

P(system empty)	0.0066		
Percentage who wait in queue	0.7075		
Expected number in system, L	9.3278	customers	
Expected number in queue, Lq	4.9528	customers	
Expected time in system, W	1.3325	Minutes	80.0
Expected time in queue,Wq	0.7075	Minutes	42.5
Percentage who don't wait in queu	0.2925		

Cost summary

Cost of facility/service	R 22.25	per Minute
Cost of waiting and being served	R 1,256.20	per Minute
Total Cost	R 1,278.45	per Minute

	Expected Number in System	Expected Number in Queue	Expected Time in System	Expected Time in Queue	Total Cost
	9.328	4.953	79.953	42.453	1278.454
1	#N/A	#N/A	#N/A	#N/A	#N/A
2	#N/A	#N/A	#N/A	#N/A	#N/A
3	#N/A	#N/A	#N/A	#N/A	#N/A
4	#N/A	#N/A	#N/A	#N/A	#N/A
5	9.328	4.953	79.953	42.453	1278.454
6	5.411	1.036	46.377	8.877	758.324
7	4.699	0.324	40.277	2.777	670.876
8	4.485	0.110	38.442	0.942	651.412
9	4.412	0.037	37.820	0.320	652.000
10	4.387	0.012	37.605	0.105	659.977
11	4.379	0.004	37.533	0.033	671.173
12	4.376	0.001	37.510	0.010	684.121
13	4.375	0.000	37.503	0.003	698.308
14	4.375	0.000	37.501	0.001	713.559
15	4.375	0.000	37.500	0.000	729.819

Probability distribution of customers in the system

no of customers, n	P(n in system)	P(<=n in system)	P(>n in system)
0	0.0066	0.0066	0.9934
1	0.0290	0.0356	0.9644
2	0.0634	0.0990	0.9010
3	0.0924	0.1914	0.8086
4	0.1011	0.2925	0.7075
5	0.0884	0.3809	0.6191
6	0.0774	0.4583	0.5417
7	0.0677	0.5260	0.4740
8	0.0593	0.5852	0.4148
9	0.0518	0.6371	0.3629
10	0.0454	0.6825	0.3175
11	0.0397	0.7221	0.2779
12	0.0347	0.7569	0.2431
13	0.0304	0.7873	0.2127
14	0.0266	0.8139	0.1861
15	0.0233	0.8371	0.1629
16	0.0204	0.8575	0.1425
17	0.0178	0.8753	0.1247
18	0.0156	0.8909	0.1091
19	0.0136	0.9045	0.0955
20	0.0119	0.9165	0.0835
21	0.0104	0.9269	0.0731
22	0.0091	0.9360	0.0640
23	0.0080	0.9440	0.0560
24	0.0070	0.9510	0.0490
25	0.0061	0.9572	0.0428

Probability distributions of time in system and waiting

t in Minutes	Prob(W > t) =	Prob(W_q > t) =	Prob(W < t) =	Prob(W_q < t) =
0.0500	0.9762	0.6730	0.0238	0.3270
0.1000	0.9516	0.6402	0.0484	0.3598
0.1500	0.9264	0.6090	0.0736	0.3910
0.2000	0.9008	0.5793	0.0992	0.4207
0.2500	0.8750	0.5510	0.1250	0.4490
0.3000	0.8490	0.5242	0.1510	0.4758
0.3500	0.8231	0.4986	0.1769	0.5014
0.4000	0.7972	0.4743	0.2028	0.5257
0.4500	0.7714	0.4512	0.2286	0.5488
0.5000	0.7459	0.4291	0.2541	0.5709

Figure 30: M/M/s for real peak times

Source: T4 M/M/s

APPENDIX 17: PRESENTATION


2005 3 13


CASINO
R169 000
2005 3 13

Current Situation

- 262 Machines, can grow to maximum of 270 machines.
- Maximum Hold % of 15%, average Hold % of 8,5%.
- Denominations vary from 2c to R10.
- Types of machines: Video, Poker, 3 and 5 Reel machines, Wheel of Gold.
- Profit of R53 million in 2004.

Problem Statement

- 1. To determine the maximum win (profit) generating the optimal combination of machines of the different denominations and types, as well as the optimal hold percentages.
- 2. To determine the minimum number of staff operating the Cash Desks to ensure minimum (economically viable) waiting times for customers.

Methods Applied to Problem

- 1. **Maximum Profit**:
  - Linear Programming.
  - Goal programming.
- 2. **Minimum Servers**:
  - Observation of interarrival times & service times.
  - M/M/s queuing Models (exponential distribution).
  - Simulation.

Maximum Profit – Findings

- **Current Profit:** (262 Machines ⇒ R53 m)
- **Maximum Profit:**
- Number of machines using average Win/machine
  - 262 Machines ⇒ R84.7 m
  - 270 Machines ⇒ R87.7 m
  - Solver Table: 300 Machines ⇒ R110.7 m
- Number of machines with goal of R100 m
  - 270 Machines ⇒ R92 m
- Number of machines using average Turnover/machine & hold % (non-linear)
  - 270 Machines ⇒ R123.9 m
  - Solver table: 300 Machines ⇒ R140.5 m

Minimum Servers - Findings

- Minimum number of Servers:
- Normal peak times
  - 1 - impossible
  - 2 - expected waiting time ⇒ 24 sec
  - 4 - expected waiting time ⇒ 0.5 sec (optimal)
- Real peak times
  - 5 - expected waiting time ⇒ 42 sec
  - 6 - expected waiting time ⇒ 9 sec (optimal is 8 but max points available are 6)

Questions?