

# Evaluating e-Commerce Success – A Case Study

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**Abstract:** The business community in the past decade has been characterised by debate over the value or effectiveness of e-Commerce and how this type of technology needs to be implemented. During this period the business world has witnessed many examples of failures of Internet based business. There is little doubt that the high failure rate in Dot.Coms had much to do with misconceptions regarding the ease with which e-Commerce could be implemented. Unrealistic expectations caused tried and tested business rules to be abandoned as hyperbole over took sound business sense. Although it is clear today that the Internet and the Web can facilitate business processes to add value to organisations, this technology has to be managed with considerable care. This paper reports on a case study conducted in kalahari.net, a well known South African e-Tailing business.

This case study highlights several valuable lessons to do with the evaluation of an e-Commerce investment and how to ensure its success. Specifically the case study closely examines aspects of kalahari.net's IS management policy, and identifies a set of preliminary e-Commerce success dimensions.

**Keywords:** e-Business, e-Commerce, Internet business, web-facilitated business, Information Systems Management, business evaluation, IS success

*In brick and mortar organizations, applications support the business, but in e-Businesses applications are the business (Kroll, 2001).*

## 1. Introduction

In the ten years, approximately, since e-Commerce became a major issue there have been many attempts to create and operate successful businesses facilitated by this technology. The establishment of a very large number of Dot.Com businesses during the second half of the 1990s reflects the high hopes which were placed in this technology. Most of these attempts have failed and the reasons for such failures are well catalogued (See for example Ames, 2001; Carton, 2001). The number of successes has been relatively small and the lessons, which can be learnt from these organisations, are not yet well known. What has become clear though, is that basic business principles still hold (Remenyi et. al. 2004).

Over the last decade, a multitude of studies have focused on various aspects of the practice of e-Commerce. Several of these studies have focused on measures and frameworks for evaluating the success of the IS function. DeLone and McLean's review of the academic and trade journals over a seven year period (1996-2002) found that "most of the articles were conceptual in nature..." (DeLone & McLean, 2004: 35). As a contribution towards operationalizing e-Commerce success metrics, this paper reports on an ongoing investigation into e-Commerce success factors. The paper presents a single case study of a well known South African e-Commerce venture,

kalahari.net<sup>1</sup>, which is regarded as one of the successes in the e-Commerce environment in that region (Financial Mail: 2004). In particular the case study examines the complexities involved in managing kalahari.net's information systems, and highlights a preliminary set of indicators of success of the IS function.

## 2. Background to e-Business in South Africa

South Africa was not immune to the e-Commerce hype. According to the Department of Trade and Industry, expectations that the Internet would boost SA's economy and revolutionise the market by allowing small firms to compete equally with larger rivals did not materialise. The general manager of information technology and communications is quoted as saying that "Many of the initial hopes of the internet revolution have been disappointing" (Stones, 2002). As well as the disappointments of the SME sector, larger organisations which participated in the e-Commerce gold rush also ran into problems. There are many examples of this. The following are some of the well known examples in South Africa.

- Broadcast Interactive Group, an internet venture with the backing of several radio stations, closed before it was properly off the ground.

<sup>1</sup> kalahari.net® is a Trademark and this is recognised by the authors.

- In July 2001, Woza, a successful independent online content company closed down after its main investor, Bytes Technology Group pulled out – even though it claimed a page impression rate of 5.5 million a month.
- The Shoppingmatrix.com, which set out to mainly retail DVDs and music CDs shut down after alleged cash flow problems.
- The SPAR national supermarket chain closed down its online shopping site due to extremely poor sales via the site.
- The banking venture Blue Bean and Twenty20 were also South African e-Commerce ventures that did not last very long (with the latter recently being relaunched).

The Department of Trade and Industry, claims that the biggest disappointment of the Internet had been its failure to empower small businesses through its capacity of allowing them to communicate more easily with customers and trading partners, and to close the gap between big and small companies. They claim that among the problems faced by start-up online companies in South Africa, businesses underestimated the necessity of having a trusted brand name to secure online sales (Stones, 2002).

A survey of online retail activity in South Africa (Goldstuck: 2002) reports that the failure rate of e-Commerce in South Africa was 35% (2000-2002) and this was predicted to grow to 40%. This survey points out that online retail in South Africa is “at a very early stage of its market penetration, and remains deeply immature in its implementation.”

Many factors contributed to the demise of the online retail market during this period. In general it can be stated that the business world underestimated the complexities and importance of many aspects of business including marketing, finance, human resources as well as not properly appreciating the challenges offered by the technology itself. Thus organisations like Boo.Com failed as much from technological and IS management blunders as it did from general business incompetence.

In light of the foregoing, research into e-Business in South Africa is timely in assisting practitioners to obtain an understanding of the complexities surrounding this business paradigm. The authors have chosen to conduct a detailed study of the well-known South African business called

kalahari.net. The objective of this case study is to evaluate this organisations success and to identify some of the key characteristics of its operation which have lead to this success. Although this case study is wide ranging in scope its main thrust is related to how kalahari.net manages and evaluates its IS function.

### **3. Research methodology**

The approach to this case study draws mainly on interpretivist methods. Cognoscente of recent criticisms of the value of management research (Starkey & Madan: 2001) and that of the relevance of certain types of empirical research in IS (Benbasat & Zmud: 1999), the authors adopted a case study approach (Yin: 1994).

The rationale of using a case study was to allow an in-depth examination of a real world problem based on an existing company already engaged in e-Commerce. Case study research according to Harrison (2002: 177) is more aptly described as a strategy than a method. It sets out to address the understanding of a phenomenon within its operating context. Of necessity, case study research is about making sense of the complexities of a real-world working environment and this is the approach taken here.

The primary sources of data for the case study were interviews with knowledgeable informants from within kalahari.net, one of whom became a co-author of this paper. The interviews took place during June and August 2004 and during March 2005. The interview transcripts were analysed using qualitative content analysis (Henning, 2004: 104-109) to reduce the data through a process of coding. Motivations for choosing a qualitative approach to this investigation are provided by Babbie & Mouton (1998:270).

The authors made several visits to the premises of kalahari.net. In addition to this we also reviewed a number of public documents of the holding company, and carefully examined the web site. This also included registering as a customer, and making a purchase. The authors also generated a “complaint” to kalahari.net’s customer support section, to determine how this was handled by the system.

### **4. An overview of KALAHARI.NET®**

kalahari.net is a South African based business referred to by its owners and managers as an e-Tailer<sup>2</sup>. It is a web and Internet facilitated

<sup>2</sup> An e-Tailer is an online retailer... and in the B2C sector, the business model focuses on sales to the individual customer (Laudon & Traver, 2003: 71).

business which sells products such as books, CDs, DVDs, videos, software, hardware, wine, and health care goods. These products are sourced from South Africa, and elsewhere. In addition to these products kalahari.net has a number of online partners through which products such as ticketing solutions to theatres, cinemas and major events may be bought.

kalahari.net is operated as a business unit of Via Afrika which is a wholly owned subsidiary division of Naspers Limited. Naspers is listed on the Johannesburg Stock Exchange and Nasdaq in New York. Naspers Limited, is today a R10 billion turnover enterprise and has R8 billion assets (Naspers, 2004). Via Afrika controls a number of different businesses operating as independent business units in book publishing and distribution, niche retail and entertainment, and in private education. In 1998 Naspers decided to take advantage of the opportunities offered by the Web and the Internet and launched through its subsidiary, Via Afrika, a number of internet businesses which included 24.com (now mweb.co.za), kalahari.net, fin.24.com and news24.com.

As mentioned above kalahari.net was first envisaged as a book selling business. The idea for this came from the CEO of Naspers. John van Relihan, who was responsible for Via Afrika's book club division, grabbed this opportunity. At this point they owned the largest book club in Africa. With so much publicity concerning the apparent success of Web based businesses such as Amazon.com it was thought that this could be emulated in South Africa and Via Afrika could do it.

Some "venture capital" money was allocated by the holding company to fund the operation. John van Relihan set up an independent team and they began working towards the creation of an e-Commerce operation.

This was the period of extraordinary hype concerning the Web and it was generally thought that it was not difficult to set up an e-Commerce operation and that it could be achieved in a short period of time. The dictum emanating from American business schools and consultants in this period was that with as little as \$50,000 and within 60 days an e-Commerce website could be up and running. This type of thinking omitted the issue of on-going costs and revenue and the breakeven period. As there was no-one in the Via Afrika group with e-Commerce experience this type of exaggeration appears to have been believed.

As a result of this thinking there was virtually no preparation for kalahari.net. There was no business case prepared, although it was generally thought that a breakeven situation would be reached in two years. No rationale for suggesting a period of two years to reach the breakeven point has been offered and even today after six years, breakeven has not been achieved. Furthermore there was no risk analysis performed. The development of the website was rushed and a launch took place in October 1998 approximately one month after the decision was taken to get into this business.

Not surprisingly the Website attracted little business. The problems with the first attempt to make kalahari.net an e-Business were typical of the many errors made by start up Dot.Com of that period.

The marketing plan was ill conceived. The technological issues and challenges, especially relating to information systems architecture, were not really understood. The web-site interface is described as being "horrendous", with long download times, and poor information on the site. The crucial internal data loading process took weeks and resulted in unreliable product data. There was no fulfilment process in place. The kalahari.net team was made up of three business oriented people, and approximately ten newly graduated IT students. The sourcing policy was not well thought through. The funding was not well conceived or planned – Via Afrika had what they refer to as an "open book" basis for funding kalahari.net. In addition, there were inadequate internal controls with which to manage the businesses.

Failure was certainly staring them in the face. The sum of the potential loss was not big in the Naspers world but the failure of an e-Commerce venture in the full light of the public media was a most unattractive prospect.

As a result of this predicament management at both kalahari.net and Via Afrika decided to re-launch the business. Via Afrika appointed Susan van der Schijff who had a direct marketing background to take over the reigns at kalahari.net in March 1999. Susan had been the product developer for the book club and she had a much better understanding as to what an e-Business was about. The re-launch took place in October 1999 and in so doing the kalahari.net management ensured that:-

- A more knowledgeable and experienced team was put in place. The largely inexperienced IT staff were dismissed, and a new team of only

four people were recruited. This included a seasoned IT manager as well as a web-site designer.

- The back office systems were reorganized to become more responsive to the needs of a web-facilitated business and the fulfilment processes were redesigned.
- The web-site itself was substantially overhauled.
- The relationships with suppliers were strengthened to ensure that more accurate product data was provided.
- The direct marketing experience of the new general manager, was used to implement new strategies to attract and retain customers. This included diversifying the product base.

Thus, in 1999, kalahari.net was re-launched in a much more thoughtful and professional way, keeping a close watch on all the important business variables. Since the re-structure and the re-launch of Kalahari.net the business has grown from strength to strength, as indicated by its increasing turnover shown in Figure 1.

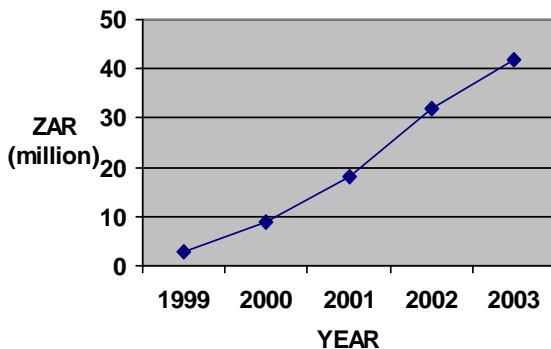


Figure 1: kalahari.net turnover

Over the past 6 years kalahari.net has become known as one of the best recognised e-Commerce brands in South Africa. It is not only well established but it has become a role model in South Africa. It was recently rated as the best site (Figure 2) from among of a possible 1000 websites (including Amazon.com) in a Financial Mail survey (Financial Mail, 2004). It was identified as the subject of this study as it offers many lessons for both well established Internet facilitated business as well as for those who wish to enter this market for the first time.



Figure 2: Kalahari.net ® Home Page (Screen shot shows partial page only)

## 5. An evaluation of Kalahari.net

As mentioned above kalahari.net is regarded as a successful e-Commerce or e-Business in South Africa. According to members of staff the reasons why kalahari.net is considered as such are:-

- Its year on year growth;
- It's the biggest B2C e-Commerce website in SA;
- It has 200,000 registered customers;
- It has received accolades from the South Africa press especially the prestigious Financial Mail;
- It has no domestic competition;
- It was the first e-Business to be fully compliant with the Electronic Communications and Transactions (ECT) Act;
- It is close to breakeven and intends to start making profits in the 2005-2006 period.

The company is regarded as a success despite the fact that it has not yet broken even. Breakeven is anticipated soon. However kalahari.net has the financial backing of a more substantive parent company which may probably be able to sustain it for quite some time if that was to become necessary. It is therefore problematical to really call kalahari.net a commercial success. It certainly is a public relations and awareness success and it is very beneficial to the Naspers Limited group to have a business which is so highly recognised in South Africa and which is so well regarded. But the objective of business is ultimately profit – or at least not making losses - and this has not yet been achieved. Therefore care needs to be taken with the use of the word success. If kalahari.net was an independent operation where the owner managers had to go to the financial market for

funding it is questionable as to whether it would have survived the hiatus in the financial markets.

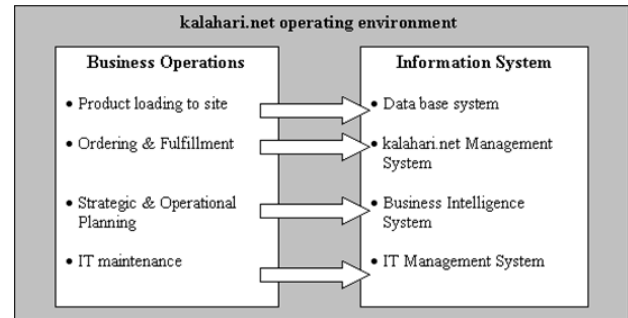
Our evaluation of kalahari.net is that the work of the past 5 years has positioned the business so that if the current growth performance is sustained and if costs are kept under control it will become a profit generator in the near future. But referring to kalahari.net as a business success when it has not yet reached its breakeven point after six years is not a description we would readily wish to use.

## 6. Meeting the IS management challenge

As mentioned above one of the major objectives of this research was to understand how kalahari.net managed the IS function (comprising 4 major systems – See Figure 3) which is regarded as a core aspect of any e-Commerce business. The interviews reveal some very interesting IS management issues. Some of these are recognised as tried and tested IS management practices, however there are some innovative ideas in use at kalahari.net as well.

Before discussing the detail of some of the management processes used by the IS function in kalahari.net it is useful to point out how critical they perceive their IS function to be for their business. Besides the fact that the website has to function without error 24/7 they also rely heavily on a wide range of other information. In the words of management,

*“Without a database there is no website and with no website there is no business. Data is needed to allow us to feed the site. Information such as how many items are available on the website, what the stock availability is, our pricing, the number of days to deliver and the number of days for products to arrive are essential. We monitor the supply chain closely. Where the stock is coming from? How much is international or how much is local? The weight, the volumetric mass, delivery dates, when will the customer receive an order, how many customers did receive on time, how many did not, to mention only some of the issues.”*



**Figure 3:** There are 4 central Information Systems at kalahari.net

In addition, the IS function is required to report weekly on issues such as, cash flows, order received per day, order deliveries per day, cost per order income, postage cost per order, exception reports on suppliers' costs.

There are also reports required on operational issues such as website down time, downloading of website time for customers etc. The management of kalahari.net clearly believe that their business is fuelled by information.

The following sections provide an overview of key areas of the organisation's IS management and operations. We view these as having a central role to play in achieving success with their IS.

### 6.1 Aligning the IT and business stakeholders

When the kalahari.net website initially commenced operations in 1998 the relationship between business managers and the embryonic Information Technology (IT) department was at a very low ebb. Thus in the initial period of kalahari.net's operations, the IS were plagued by serious problems such as bugs, and generally inadequate performance. This is hardly surprising when one considers the fact that the website was developed and was up and running within one month by what was in effect very young and inexperienced people.

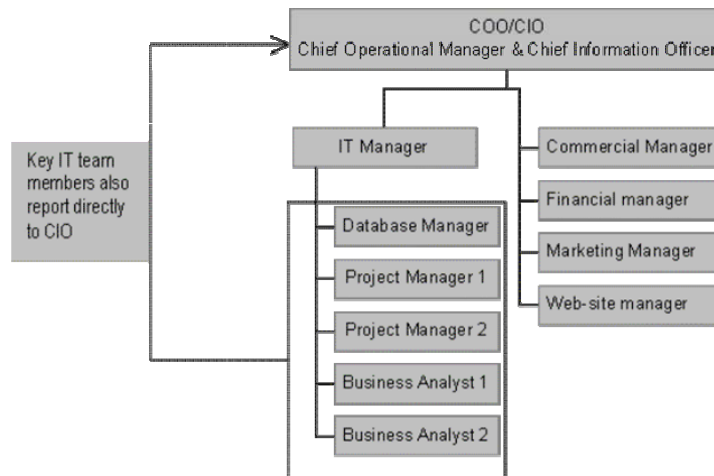
Due to the rush to be in business the initial attitude of business managers was "Get something going, get it on the web", without proper consideration as to the implications of their requests. This is clearly an unsatisfactory approach to IS. However the IS function responded as best it could by trying to implement these requests without fully understanding what was really required. This led to unsatisfactory systems which in turn resulted in distrust between the two parties and an eventual a substantial breakdown in communications.

After this rather messy start the senior management made a strategic decision to bring

together in a much more functional way the business and IS stakeholders. In working towards this they firstly outsourced the IS department in total – the management of kalahari.net felt that the extra burden placed on managing IS personnel placed a burden on their abilities to keep focused on the business. In doing so, a very important condition was placed on outsourcing - the outsourced partner was required to base its personnel at kalahari.net’s headquarters in Cape Town. Secondly controls embodied in IS development and maintenance methodologies were introduced for all aspects of IS work.

## 7. Maintaining the business and IT partnership

The philosophy behind kalahari.net attitude to maintaining a sense of partnership between the business and the IS function was to ensure continuous dialogue between these two groups. This was affected through regularly scheduled meetings.



**Figure 4:** kalahari.net Business Task Team

The IS-Business partnership is maintained using a three-pronged strategy:

The first step in establishing this dialogue was to establish a weekly business-prioritising meeting. A task team of business stakeholders (see Figure 4) meets weekly with IT managers to address immediate, short-term and medium term priorities. These team meetings had a positive effective in fostering greater co-operation between the Business and IS, as well as between different managers of the business.

Secondly, attention was focused on systems development methodologies. IBM Rational Unified Process®, or RUP®, methodologies were introduced. RUP®, is a comprehensive, Web-enabled set of software engineering best practices that provide guidance for streamlining the team’s activities (Kroll, 2001). Business analysts at kalahari.net have given RUP the thumbs up, and favour its ability to provide sets of project documentation that is meaningful to both IT and business stakeholders. In this way all the role-players can participate meaningfully systems development phases. As a result of the implementation of this new methodology,

business stakeholders became fully involved in all phases of the systems development life cycle (see Figure 5).

Thirdly, key IT team members became involved in decision making at all levels. They are involved in making IT project decisions as well as in routine business meetings at which issues such as gross profit, budgets, turnover etc. are discussed.



**Figure 5:** RUP® Systems Development Cycle  
Source IBM [http://www-306.ibm.com/software/awdtools/rup/]

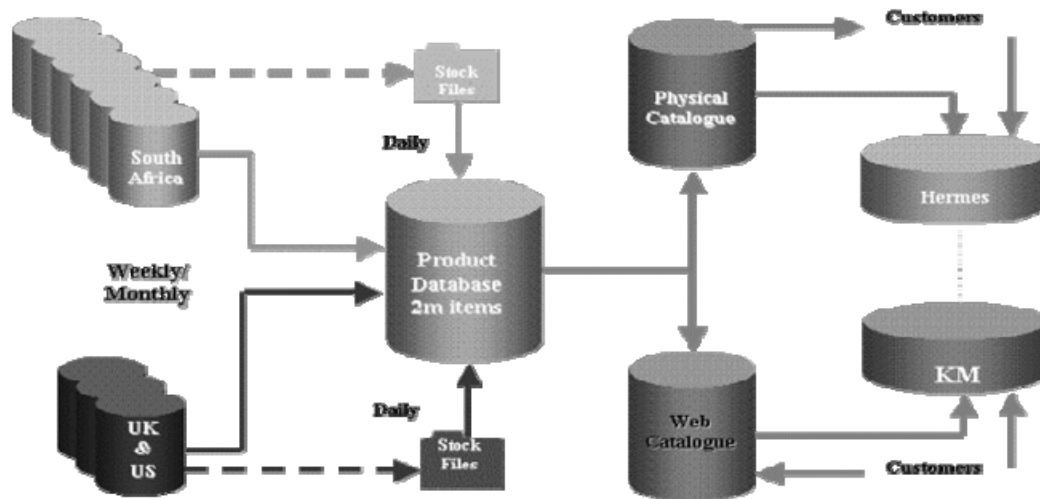


### 7.1 Database management is central to operations

Central to e-Tailing is the management of a large database. kalahari.net is linked to approximately 400 supplier databases all over the world – these range from 2 million products down to only 2 products. A primary kalahari.net database houses all product information (See Figure 6). Extreme care is taken to ensure the accuracy of the data. There is no room for

errors e.g. a DVD that should retail for R899 should not be sold for R89.99.

Suppliers are totally responsible for providing the data to the primary databases each day. Since it is not possible to manually check such a huge stock database, exception reporting takes place to identify errors e.g. selling price is lower than the cost price.



**Figure 6:** Ensuring suppliers update the database with accurate data is an all important business process. Source [ kalahari.net@]

In addition to exception reporting, a suppliers report is maintained to determine how many suppliers have actually sent through an updated data file, at what time did the report come through, and how long did it take to upload.

### 7.2 Ordering and fulfilment

The kalahari.net Management System (KMS) which is essentially a CRM system handles all ordering and fulfilment processing. Central to ensuring that these key processes function smoothly, is once again, the integrity of the data being handled.

KMS is used to monitor the purchasing cycle. Orders to suppliers are compiled twice daily, and depending on the facilities available at the supplier end, these are either electronic (EDI, FTP, email) or manual (via fax). All transactional data relating to orders in the pipeline are handled by KMS. This is processed and is available as a report which gets prioritised each morning at the start of the day. Based on the data and supplier reports, customers are contacted regarding delivery of products on time. kalahari.net also utilises manual methods such as telephone or fax to verify orders to suppliers.

### 7.3 Efficient delivery systems

Suppliers and couriers have deadlines and must adhere to agreed SLAs e.g. overseas suppliers have an hour after receiving a FTP file to report on fulfilment problems – thereafter they have up to 24 hours to have products transported to a designated courier. Within 2 days the products are shipped to kalahari.net’s distribution centre near Cape Town International airport. Thereafter the shipping agents at the airport have 1 day to clear customs and excise and to transport the goods to distribution centre where streamlined processes ensure minimum delays in delivery to the customer.

### 7.4 Essential web-site features

There are several key features on the Web-site that are viewed by kalahari.net’s management as central to success.

The first of these is the site’s search engine. The use of the search facility by a customer usually marks the commencement of a potential transaction. Consequently the search facility is continuously tested. In addition to this all searches conducted are produced as

reports in order for the Marketing department to monitor the interests of shoppers.

Secondly, downloading time of the web pages is considered crucial. kalahari.net prides itself on providing its customers with a download time of 8 seconds or lower and considerable resources have been spent on design and technical infrastructure to make this a reality. Monitoring of the download time takes place through continuous testing of the loading time.

Thirdly, merchandising is viewed as being important. Quick turn around on updating stock items – IT must be able to support updating of products – they to achieve updating within 10 minutes.

Fourthly, with regards the payment gateway kalahari.net ensures that within 2 seconds a customer will receive feedback on verification of card, as well as authorisation of payment.

### 7.5 Business intelligence for management decision making

At the core of both strategic and operational decision-making is a Business Intelligence System (BIS) (Figure 7). Information from BIS is used for both strategic as well as day-to-day planning. BIS is an IS responsibility with a manager assigned to the BI system reporting to the CIO.

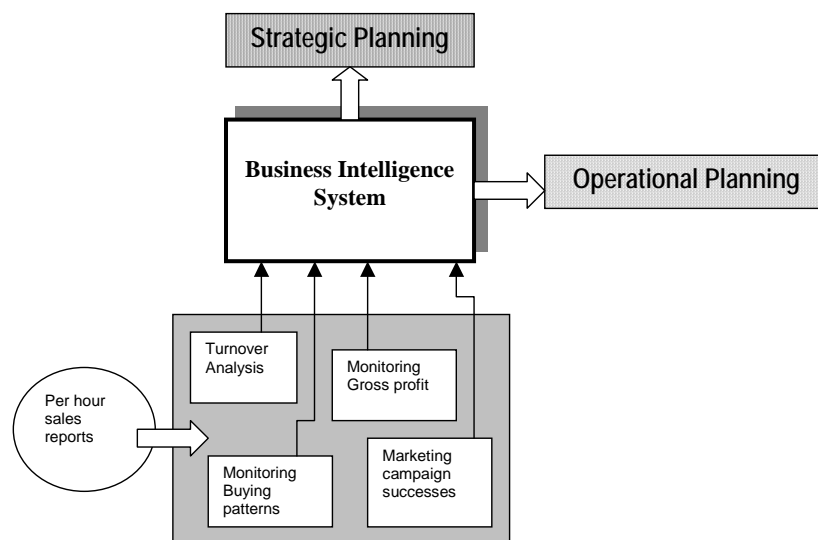


Figure 7: Business Intelligence System

As one of the core functionalities, the BIS provide hourly and daily sales reports, which are either used operationally or presented as detailed turnover analysis report to senior management. Turnover is also monitored per product category which can be viewed at any time of the day. This report assists in monitoring feedback on marketing, doing customer profiling, and in identifying areas in which the kalahari.net brand needs to be strengthened. Gross profit is also monitored daily in order that managers make decisions speedily when profits fall below expected margins.

### 7.6 Trust and privacy

In South Africa, the Electronic Communications and Transaction (ECT) Act was promulgated in 2002. The Act introduces a number of regulations to SA's e-commerce community. Among other things, the Act provides for the protection of consumers in

terms of privacy and the security of electronic payments (South Africa, 2002).

In 2002 a B2C e-Commerce Readiness Survey was conducted by South African based Buys Attorneys and Trust Online, examining the websites and legal notices of 607 South African websites. Buys and Trust Online examined legal notices, privacy policies, terms and conditions of use, disclaimers and security policies. kalahari.net was found to be the only company that was 100% compliant with the ECT Act. As a result, in August 2002, the company went public, with a claim that it was the first South African e-Tailer to be compliant with the requirements of the ECT Act and was also fully in support of the efforts made to protect the consumer (e-Strategy, 2002).



## 8. Key elements of the business model

kalahari.net's management is emphatic that traditional business rules apply in the way they conduct business. However they are aware of the key differences between managing a brick and mortar retailing operation and that of an e-Commerce shop front.

First and foremost a brick and mortar-retailing model is essentially a collection model – the business procures products from suppliers and the customer goes to the business to “collect” the goods. However e-Tailing is a delivery model – customers don't collect but they receive.

Secondly, e-Commerce is a direct marketing business. All direct marketing principles are applicable whereas brick and mortar use distribution marketing. This is a very critical difference to the brick and mortar environment.

Thirdly, the demand on speed in the e-Commerce environment is much greater – customers are not tolerant if products are not available in the same way that they can be with a brick and mortar business.

Fourthly packaging in e-Commerce is crucial as the business is responsible for delivery of goods.

Fifthly, the database is a major difference e.g. a brick and mortar retailer is not as concerned about customer databases in the same way as the e-Commerce business. Accurate data pertaining to delivery addresses, email addresses, correct products etc. are of paramount importance.

Lastly, a very sound relationship with suppliers is required to ensure that the suppliers understand the importance of supplying accurate product data.

## 9. Towards an evaluation of the IS function

The way in which the IS function at kalahari.net evolved is interesting for several reasons.

During the initial period it appears that the IS requirement for an e-Business was substantially underestimated. Via Africa charged into this business with no real understanding of what IS infrastructure was required to create an organisation like

kalahari.net and to establish an industrial strength online business.

The IS team which developed the early website were clearly not adequately experienced from either a technological or from a business point of view. The comments made by kalahari.net concerning the IS function's lack of communications and understanding, although present in many organisations, seems to have been chronic in this case.

The termination of their employment and the outsourcing of the IS function seems to have been an inevitable consequence of the lack of planning undertaken in the pre-launch phase and the poor management during the first year of operation. Disposing of the IS team in this way this could not be regarded as a sign of successful management and it is likely that it was not confidence building for the other members of the organisation either.

At the re-launch of the business there is clearly a new understanding of the role of IS in such an online retailing organisation. The IS function has effectively moved to the centre of the stage. IS is perceived as being a major focus of business attention and the IS staff is brought right into the centre of business decision-making.

The regime of regular meetings of business and IS colleagues and quick follow up of decision and solutions to problems demonstrates a whole new understanding of how to use this technology. The use of modern systems methodologies that caters for the involvement of all stakeholders is also an indication of the new attitude towards IS in the business.

The following provide some indication that in the current setup of the IS function is performing at a satisfactory level:

- There is a very small error rate recorded on the product database.
- The payment gateway, and checkout process works smoothly.
- There are a number of payment options, all of which work well. This is due also in part to a strong relationship with the relevant 3<sup>rd</sup> parties.
- The web-site was voted as the best of a 1000 sites by the public. This is an indication that it is meeting the needs of its clientele.

- The synergies between the four major IS (and their associated portfolio of applications) discussed in this paper, appears to support the attainment of the business objectives - the bottom line of which is to get closer to break-even.

Like the evaluation of the success of the kalahari.net business, in general it is too early to pronounce on the success of the IS function - but it is nonetheless easy to see a much clearer understanding of the importance of IS in their business and a much more intensive approach to integrating IS and business functions.

## 10. Future requirements

Current management of the IS infrastructure occurs on a needs basis - with the impact on turnover being the most common indicator of success/failure. We would rather suggest that the business requires an integrated assessment procedure. Such a procedure must provide a framework to evaluate the various components of the IS infrastructure, in a way that gives management the ability to monitor the impact of the technology (and thus their investment) on the attainment of specific

business objectives. Such an assessment should be conducted periodically, so as to aid medium term and longer-term decision-making.

As a starting point towards an integrated assessment procedure, a summary of critical e-Commerce functions that require IS support are identified. These are presented in Figure 8, which highlights a preliminary set of IS related metrics that were identified during the investigation. These metrics are mapped onto Angehrn's ICDT model (Angehrn, 1997). The ICDT model identifies four virtual spaces on the internet (Information, Communication, Transaction and Distribution spaces), and is one useful way of differentiating the applicability of metrics. Furthermore these four virtual spaces lend themselves to the customer buying cycle (van der Merwe & Bekker, 2003) viz. need recognition, gathering information, evaluating information, making a purchase. The organization of metrics in this way will allow kalahari.net management to monitor critical areas of the business, in terms of identified needs e.g. an increase in page hits, but decrease in purchases may prompt a closer look at items associated with the *Virtual Transaction Space*.

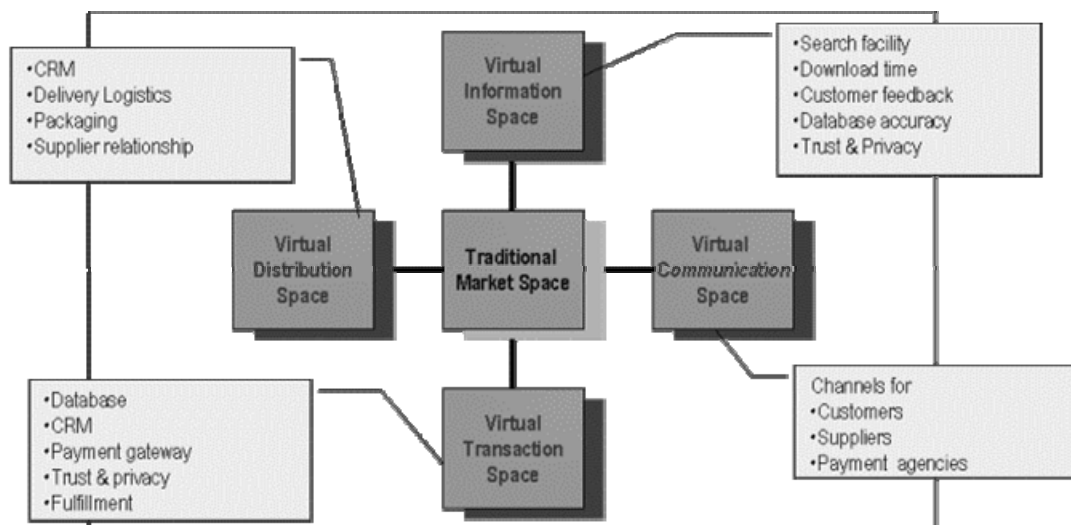


Figure 8: Preliminary metrics for evaluating e-commerce success

## 11. Lessons from the case study

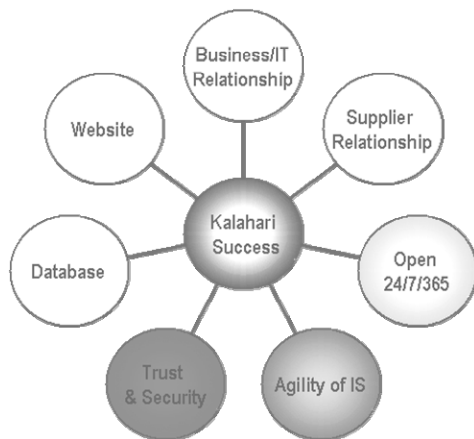
From the discussions with the management of kalahari.net it is apparent that they believe that there are several special issues on which they have to focus which are different to a traditional bricks and mortar business. These issues as well as other pertinent success criteria, highlighted in the foregoing discussion, are presented in Figure 9, as a set of critical success factors.

In particular the following areas of business operations are deemed to be critical to the success of the e-Commerce business:-

- At all costs the electronic shop-front must be kept open and active 24/7/365 – this includes ensuring the availability of a hot-site. Site under construction notices and other distractions by which the shop-front is not available are extremely counter

productive to the business. The electronic shop-front needs to be as attractive as possible and have as wide an appeal as possible.

- Agility and flexibility - the IS infrastructure must allow for the business to be agile in responding to product updates to the web-site, advertising of specials etc. Changes have to be made immediately. Any substantial lead-time involved represents lost revenues.
- An effective, efficient, database infrastructure is essential for a successful online retailing business. An on-line shop lives by its twin databases. These are the product database which represents the inventory in the shop front and needs to be both up-to-date and error free and the client database which represents the main market opportunities. The product database needs to be seamlessly connected to the procurement and delivery systems to ensure that the correct items are delivered on time.
- IT and business stakeholders need to think together, and engage in joint decision making across all areas of business – including “non-IT” issues. There is just no room for a “culture-gap”.



**Figure 9:** Critical success factors of the business

Make every effort to ensure the privacy of customer data. In the e-Tailing environment, the volume of successful transactions, is directly dependent on the trust the customers have in your systems' ability to offer secure transactions.

The web-site requires: minimum download time, accurate and smooth searching facilities, minimal click through rates, a quick payment facility, pre-

orders facilities for purchasing of products prior to product launch, and visible security features. The electronic shop-front needs to centre around the customer.

## 12. Conclusion

In this paper we have described a South African e-Business operating in the B2C environment. A set of preliminary metrics for evaluation, as well as Critical Success factors, has been identified. The key aspects of the findings of the case study indicate a few important lessons regarding both the management of IS and that of the business. In addition to the lessons already outlined, the following need to be highlighted:

- One of the key issues relating to the creation, deployment, and maintenance of IS infrastructure in an e-Business relates to the relationship between business and IT stakeholders. The case study demonstrates that e-Business requires the bringing together of these stakeholders in not only the day-to-day management of the business, but also in key-decision making structures. Furthermore, the utilisation of systems development methodologies that are friendly to all stakeholders has been shown to be a contributory factor to this relationship.
- The use of a modern IT management tool is crucial to keeping the IS infrastructure functioning. Systems need to be monitored vigilantly, and have to be kept as lean as possible to ensure reduced workloads on both systems and people.
- Business is business, be it electronic or brick and mortar. However, the common element is the financial statements. Money does count, and kalahari.net has demonstrated that all eyes are on problems that directly affect turnover and gross-profit. Indeed these are monitored and reported daily, and business reacts with agility, if either of these are not meeting targets. The company's information system is always the first stop in reacting to a falling bottom line.
- In the electronic on-line trading environment, database technology is the most central aspect of the IS infrastructure. Extreme care, and diligence is taken to ensure that product data, and customer data, is accurate. There is no room for errors,

and successful transactions depends entirely on the way in which this is managed.

It is not our intention to offer these findings as generalizations for the e-Business sector in South Africa, and elsewhere, but rather to offer these findings as an initial set of criteria that could be used to adapt business models, and improve management practice. Many of the issues raised are mostly pertinent to the B2C environment, but

issues around procurement of goods are important to the B2B sector as well.

Future work includes, further investigation and collection of empirical evidence of e-Commerce success metrics in order to verify and extend those identified; comparison of findings in this case study to others; and the development of more comprehensive framework for measuring the performance of IS in e-Commerce businesses.

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