

E Business and the University of Guyana

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Abstract

The age of globalization, declining barriers to cross border trade and advancements in information and communication technologies has brought with it many challenges for businesses. Time and distance no longer pose barriers to competition. In such an environment it is imperative that businesses, the University of Guyana for example, adapt if they are to survive in this ever changing environment. The aim of this paper is to examine the E Business activities of the University of Guyana and to provide recommendations on the way forward especially since the University also faces competition from local private institutions. The conclusion was drawn that E Business (Electronic Commerce) can increase sales and reduce transaction costs of the University of Guyana and ultimately increase its profitability. However, even though the University of Guyana's product (education) lends itself to digitization, it will be unable to take advantage of this, if it is unable to launch its Information and Communications Technology Strategy. Additionally, the lack of an e-commerce and copyright legislation will make it difficult for the university to access global markets and engender confidence in customers that their transactions will be secure or that redress can be sought in the courts for breaches in contracts. The preparedness of lecturers; the state of the economy; every home not having a computer or internet access would also be issues that the university would have to overcome if it is to reap the associated benefits of electronic commerce.

Keywords: *E-Business, Alignment Information Strategy, Business Strategy, E-Commerce, E-Security, Drivers, Culture, Trust, Language*

1.0 Introduction

The University of Guyana is a state owned institution and was established on October 01, 1963. Its aims are:

“to provide a place of education, learning and research of a standard required, and expected of a university of the highest standard, and to secure the advancement of knowledge and the diffusion and extension of arts, sciences, and learning throughout Guyana” (Government Information Agency, 1993).

The University of Guyana has two campuses – The Turkeyen Campus and The Berbice Campus. The Berbice campus, opened in November 2000, was established to provide access to university education to persons in that region who were unable to attend the Turkeyen Campus. Owing to the lack or unavailability of skilled labour in the Berbice region to deliver its programmes at the Berbice Campus, lecturers from the Turkeyen Campus commute to take care of these needs.

The University faces competition from private institutions, local and international, which offer university level training but still has the dominant market share in this sector. Main sources of finance for its operations comes from annual government subventions (subsidy), student fees, rental of real estates, endowment funds, consultancies, funding from resources projects and other donor programmes (Benard, Simon-Saigoo, Da Silva, & La Rose, 2002).

A web page, maintained by the University's Computer Centre, is utilized to market its programmes and to provide information on its activities to interested stakeholders. There are no virtual programmes delivered as yet by the university even though the university is quite cognizant of the propensity of Information and Communication Technology in allowing it to reach a much larger range of customers (students). However, some lecturers utilize the internet to provide information on lectures, assignments and other materials for particular courses taught by them (Benard, Simon-Saigoo, Da Silva, & La Rose, 2002)

The Institute of Distance and Continuing Education, an arm of the University of Guyana, offers a number of courses via distance learning mode two of which are offered online (University of Guyana, 2008). The university has as yet to make full use of ten computers and a server provided under UNESCO-UWI Caribbean Project for Integrated Distance Education (CUPIDE) for online education (UWI/UNESCO, 2007) and had in the past acquired a server to become an ISP which has since become obsolete (Benard, Simon-Saigoo, Da Silva, & La Rose, 2002).

The paper intends to analyze the E-business activities of the University of Guyana relative to six themes: E Business; the Relationship of Business Strategy to Information System Strategy and Information Technology Strategy; Industry and Competitive Analysis; Drivers of E-Commerce; E-Security; Trust, Language, Culture and the Global Economy; and to recommend a way forward.

2. E-Business

Electronic business describes the process of buying and selling or exchanging products, services, and information via computer networks including the internet as well as servicing customers and collaborating with business partners and conducting electronic transactions within an organization. It can take many forms depending on the degree of digitisation of the product (services) sold, the process, and the delivery agent (Turban, Lee, King, & Chung, 2000).

According to Chen (2001) the internet has vastly changed the way in which businesses can be and are conducted by eliminating distance and time. It has made it possible for the education industry to engage in economic activity (e commerce) nationally and internationally through the digitisation of its product and benefit from efficiency gains through reduced transaction costs, faster throughput and better information to all members of the value chain.

The University of Guyana is well aware of this concept and has a website which it utilizes to market itself; to communicate and disseminate information to interested stakeholders within and outside the institution; and as a means of student support (online application and registration). However, as has been

determined by (Chatterjee, Grewal, & Sambamurthy, 2002) not many firms have succeeded in leveraging the many functions offered by the Web in their business activities. This is typical of The University of Guyana which has yet to take further advantage of the other opportunities offered by the web such as the delivery of online courses and online payments of fees which will see them benefiting from the much touted efficiency gains such as reduced transaction costs, faster throughput and better information to all members of the value chain instead of just a few.

3. The Relationship of Business Strategy to Information System Strategy and Information Technology Strategy

The University of Guyana has once sought to become an ISP by purchasing a server which has since become obsolete and in 2007 acquired twenty computers and a server for on line education which has yet to be utilized fully. The question which arises is why has the University of Guyana not been able to take advantage of these tools to improve its business performance and benefit from the efficiency gains obtainable from the web? The answer lies in its mission statement.

‘The mission of the University of Guyana is to discover, generate, disseminate and apply knowledge of the highest standard for the service of the community, the nation and of all mankind within and atmosphere of academic freedom that allows for free and critical enquiry’ (University of Guyana, 2006-2008).

Any information technology strategy should be aligned to the Information system strategy which should in turn be connected to the business strategy of the organization. If there is misalignment among any of these factors then any information and communications strategy will result in failure (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013; Gerard & Grabski, 2002; Robb, 2005).

An examination of the Draft Strategic Plan (2006-2011) for the University of Guyana indicates that Strategic Goal Numbered 5 caters for the deployment of information and communication technologies to improve access and organizational effectiveness and the means by which this would be done is also outlined Table 1. However, the mission statement does not specifically state what the university intends to provide through electronic commerce.

Critical success factors such as the acquisition of cheap broad band being essential to online delivery of courses is also outlined by strategic goal numbered 5. Noteworthy, is the fact that the university had acquired twenty computers and a server; a handful of staff has undergone training in the development and teaching of online courses but only the Institute of Distance and Continuing Education an arm of the University has to date offered any online courses and no mention is made with regard to entire programmes being offered by this method. Additionally, some staff members on their own initiative have developed websites on which they place materials for the courses taught by them for access by students. This is clearly indicative of a lack of coordination between the efforts of the university and that of the staff which results from lack of alignment of IT Strategies with the Business Strategy of the organization. It is obvious too that the university clearly lacks the financial resources to achieve its ICT objectives and as such has to rely on outside help (University of Guyana, 2006-2008). Further, Molla& Licker (2005) found that in developing countries, in the initial stages, the adoption of E commerce is related to organizational factors such as human, business and technological.

4. Industry and Competitive Analysis

An Industry and Competitive Analysis of the University of Guyana (Table 2) revealed that the institution has strengths and opportunities which it can utilise to take advantage of the benefits of ecommerce activity. It has also highlighted those areas that the university will have to overcome if it is to achieve self-sufficiency and not continue its reliance on the government for financing.

- The University of Guyana has a committed staff and the technology to deliver online programmes/courses. It can market itself as a low cost institution owing to its relatively low fees (G\$127,000 or US\$635 per annum). This will serve to attract additional customers (students) and serve to generate additional income from the online delivery of courses/programmes. However, there may be some resistance from lecturers to this mode of delivery since the university has for the past fifty years delivered programmes using traditional methods.
- Present and potential students in Guyana who find it difficult to attend classes at scheduled times, due to the fact that their employers refuse to release them to undergo such training, will particularly benefit from such a venture since they will be able to access materials at times convenient to them and not have to suffer when they are unable to attend lectures.
- The online mode of delivery will also benefit the university since it will enable lecturers to deliver classes from Turkeyen instead of travelling to the Berbice Campus and reduce the costs that are normally incurred when lecturers commute. However, plans would have to be developed to deal with the security of data communications and transactions and the fact that not every home has a computer or internet connectivity.
- The ability to attract foreign students may be inhibited by the small amount graduate programmes offered and the lack of accreditation of many of the university's programmes and thus reduce the ability of the university to enter the global market and capitalize on its online initiative. This will provide competitors of the university with opportunity acquire additional market share.

5. Drivers of E-Commerce

Business organizations exist in an environment that is constantly changing. Their very survival may very well depend on how aware they are of changes in this environment and being able to plan for them. Research by Molla & Licker (2005) indicate that environmental factors impact E commerce activities in developing countries in the later stages. Consequently, it is argued, for the University of Guyana to attain the efficiency gains offered by e-commerce then it too has to take cognisance of the political, telecommunications and technology; legal; social and human; economic environment which are necessary infrastructure for any e-commerce activity and have the power to enable or impede the successful operation of the University's e-commerce initiatives. An analysis of the environment revealed the following:

(i) Political Infrastructure

National policy is seen as a key feature to the success of E Businesses. Specific legislation relating to e-commerce laws and information technology and the liberalization of telecommunication are drivers of e-commerce (Gibbs, Kraemer, & Dedrick, 2002). The government of Guyana is very supportive and aware of the role that information and communications technology can play in enhancing the performance of the economy and to this end have developed an ICT National Strategy (Government of Guyana, 2006). The need for an e-commerce law has also been recognised and to this end the Government has drafted an e-

commerce bill (Government of Guyana, 2005). The passing of this bill will serve to foster trust in the e-transactions of the University.

(ii) Telecommunications and Technology Infrastructure

The liberalization of telecommunication is a means through which the cost of information technology can be driven down. This makes ICT and internet access more affordable to consumers (Gibbs, Kraemer, & Dedrick, 2002). The advent of a new telecommunications provider Digicel has opened the doors somewhat for competition to the monopoly holder Guyana Telephone and Telegraph Co. Ltd. However, not every home has access to a computer despite the One Laptop Per Family (**OLPF**) initiative of the Government of Guyana and internet access is problematic owing to its high costs. This will be an obstacle that would have to be overcome by the university to secure the success of its online initiative locally. The university may have to advertise its services in the traditional manner if it is to reach such customers.

(iii) Legal Infrastructure

There is no e-commerce or modern copyright laws as yet in Guyana. The copyright law dates back to 1956 and according to the Gale Group, (2007) the law takes a pretty slow course in Guyana. This would have implications for persons seeking redress from the courts for breach of online contracts and serve to inhibit transactions flows due to lack of transaction integrity.

(iv) Economic Infrastructure

Guyana is one of the poorest countries in this hemisphere (The Gale Group, 2007). This is probably one of the reasons why the University of Guyana faces so little competition from the other private institutions offering accredited programmes in Guyana and even from abroad. Its fees are relatively cheap and students can access loans from the government of Guyana to pursue programmes at the University of Guyana. This may prove advantageous in attracting students from the Caribbean but disadvantageous since fees received may be insufficient to cover the initial cost of capital of implementing a full scale e-commerce operation and give a required return on investment. However, this may only be in the short term since the characteristics of a digitised product makes the marginal cost of continuing the programme in the long run small.

(v) Social and Human Infrastructure

The lecturers of the university will have to be trained to prepare them to use information and communications technology in the delivery of their courses. This will take time and barriers to resistance to change will have to be overcome. Top management can assist in this regard by offering visions and guidelines to managers in departments and business units about the opportunities and risks in assimilating Web technologies with the emphasis being placed on the positives rather than the negatives. Importantly, when top management actively participate in shaping the vision and strategies for the use of web technologies their actions send powerful signals to the rest of the managerial community (Chatterjee, Grewal, & Sambamurthy, 2002). Hence the ICT initiative of the University of Guyana requires top management championship if it is to move from where it is. As a matter of fact, any change effort requires the participation of everyone in an organization if it is to be successful.

The level of remuneration received by lecturers would also have to be addressed since lecturers may view the initiative of being more work for the same pay.

6. E-Security

Security is important in any financial system and hence web transactions, data and communications need to be protected from being intercepted, read and modified illicitly, users misrepresenting their identity to commit fraud and unauthorized user on one network gaining access to another (Kosiur, 1997) and non-repudiation (Turban, Lee, King, & Chung, 2000). The use of encryption, authentication and firewalls serve to militate against these threats (Kosiur, 1997). Encryption is especially important when it comes to protecting intellectual property rights. Table 3 specifies the security threats along with the corresponding solutions that have to be considered by the University of Guyana if its e-business strategy is to be met with success.

6.1 Corner Stones of Security

Having the right security measures in place will engender the confidence of customers (students). According to the National Computer Security Centre Association (NCSA) as cited in Turban, et al. (2000) there are four cornerstones of secure e-commerce: authenticity; privacy; integrity; and non-repudiation.

- **Authenticity** – TCP/IP use passwords to identify senders but this method is not hacker proof.
- **Privacy** – once a message is received, the sender must be assured that its contents remain private. A record of the sites visited by users is normally logged and unscrupulous use is sometimes made of cookies by some advertisers.
- **Integrity** – care has to be taken that hackers do not tamper or acquire information of customers.
- **No Repudiation** - a digital signature can make it difficult for a customer to deny that an order was placed by him.

Encryption can ensure the confidentiality and privacy of messages and digital signatures can secure authenticity and guard against denial (Turban, Lee, King, & Chung, 2000). This also serves to guard against the cost of breaches to the University of Guyana.

7. Trust, Language, Culture and the Global Economy

Trust, language and culture are key issues which have to be dealt with by any company which uses the web to improve business processes (Schneider, 2007).

7.1 Trust

Trust is a vital element that needs to be considered by organizations wishing to conduct E Commerce activities (Abyad, 2011; Kracher & Corritore, 2004; Shahibi & Fakeh, 2011) and when absent serves as a deterrent to online business transactions (Khorshidi, 2012; Seer, Beracs, & Pop, 2012). Businesses that have brand names find it easier to develop the trust of their customers. Those that do not, like the University of Guyana will have to spend time establishing relationships with customers in order to engender their trust and to this end develop a plan to establish its credibility (Schneider, 2007). One way of doing this is to form a strategic alliance with an educational institution that already has the trust of customers and leverage this trust on to the university. The danger of such a strategy is that it has the potential to destroy the brand of the institution so utilized and there may be reluctance on the part of the institution to enter into such an alliance.

7.2 Language

Different language versions of web site will have to be provided if university is to reach potential customers. Some languages will require multiple translations for the different dialects (Schneider, 2007). This may require them to translate thousands of web pages and given the financial constraints of the university this will no doubt be prohibitive. The cultural element is very important here since this can impact on the user's interpretation of the text placed on websites.

Culture has also been found a determinant of the success of an organization's E Business activities (Seer, Beracs, & Pop, 2012). The combination of language and custom is called culture. The university must take cognisance of the language and custom which makes up the culture of any region in which they propose to operate since symbols and certain words often have different connotations for different people (Schneider, 2007).

7.3 Culture and the Government

Some governments like the Republic of China often control what their citizens are allowed to access via the web and to this end effect legislation to control what they access and others require advertisements to be translated into their language (Schneider, 2007). Clearly this will curtail the countries in which the university can do business.

8. Conclusion

Electronic Commerce can increase sales and reduce transaction costs of firms and ultimately increase their profitability (Schneider, 2007; Seer, Beracs, & Pop, 2012). However, the University of Guyana, even though its product (education) lends itself to digitization, will be unable to take advantage of this unless it is able to launch an Information and Communications Technology Strategy that aligns itself with the mission of the university. The mission of the University however, does not address specifically the issue of electronic commerce and hence may impede the progress of any online initiative. Of importance too is the championship of top management of ICT initiatives and the involvement of everyone in the change efforts of the university which appears to be lacking. The advent of the new Vice Chancellor seem to signal a champion in this regard.

The lack of an e-commerce legislation and copyright laws that date back to 1956 will make it difficult for the university to access global markets since customers will not have the confidence that their transactions will be secure or that they can seek redress from the courts for breaches in contracts. The enactment of an e-commerce or updating of the copyright law will serve to eradicate this but even then customers will still have to deal with a judicial system that is painfully slow.

The preparedness of lecturers to develop and deliver online course content materials is another issue which would have to be dealt with in addition to natural resistance to change owing to age of the organization and its customary way of doing things.

The state of the economy is at present serving as a barrier to global competition but this may not always be the case. Growth in the economy will serve to increase the wealth of citizens and hence make it an attractive environment for competitors to enter, *ceteris paribus*. Additionally, the lack of accreditation for its programmes will also serve to erode its market share in a strong economy.

Methods of dealing with the fact that not every citizen has access to the internet or owns a credit card would have to and can be overcome.

9. Recommendations

- The University of Guyana should include in its mission statement a positive pronouncement of what it intends to make of its e-commerce initiative and charge a specific department or section perhaps the ICT department at Turkeyen with the implementation of its e-commerce initiative. It can even develop a new division to implement its ICT initiatives.
- Use the Berbice Campus which has a small student population to launch a pilot project. The computer lab at the campus has Direct Satellite Link and provides a means for student access. A pilot project will help to uncover problems associated with online delivery of courses and provide solutions for them so that they are not repeated when the university goes on a larger scale.
- Staff who have undergone training in the development and delivery of online courses can be used to train other lecturers. This will result in cost savings and a much broader participation of employees in the ICT initiatives of the university. Additionally, a strategic alliance can be made with the University of the West Indies which has considerable experience in the online delivery of programmes.
- The university should actively pursue measures to ensure that its programmes are accredited since they will not remain unscathed owing to the increasing developments in information and communication technology which has served to remove barriers which formerly kept competitors at bay. This will also enable the university to attract foreign students based on its low fees.
- Acquiring the necessary software to ensure security encryption will enable the university to provide data, transaction and communications security and hence engender confidence in customers.
- Provide a mechanism where students can obtain e-cash to effect online payments.
- Top management should champion the ICT initiative of the university since this will enable them by their actions to stimulate staff and make them more receptive to the change.
- The remuneration of staff would have to be addressed since they may feel that they are doing more work for less pay. This would however, serve to eradicate any cost savings gained from using staff to train others but may help to ensure their cooperation in the ICT initiatives of the University.

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Table 1. ICT STRATEGY- UNIVESITY OF GUYANA

| Strategic Goal 5 | Key Initiatives/Strategies | Expected Indicators/Outcomes | Considerations and Assumptions | Budget Estimate US\$ |
|--|---|--|--|--|
| Deploy Information and Communication Technologies to Improve Access and Organizational Effectiveness. | <p>The University continues to pursue activities in (i) the Caribbean Universities Project for Integrated Distance Education (CUPIDE) and (ii) the Caribbean Knowledge and Learning Network (CKLN) project.</p> | <p>CUPIDE will provide a server for Learning Management systems, learning management software, training in web-based delivery and Learning Management systems, 10 printers and 5 binding machines and Two-way IP enabled VSAT terminals to the 7 IDCE centres. Project is scheduled to end in December 2006.</p> <p>CKLN will provide further training, a ICT/distance education strategic plan, a local area network and Cheap broadband interconnectivity via e-links America.</p> | <p>CUPIDE will pay for the first year of bandwidth for each institution. After that each institution shall be responsible for this cost. UG is approximately US\$15,000 per annum. This cost will be met by fees from the on-line courses.</p> <p>The provision of cheap broadband is essential to the on-line service and it is necessary that CKLN be assigned a broadcasting frequency in each territory. UG has been asked to assist in this.</p> | <p>The Japanese government, through UNESCO, is funding the CKLN project. Total budget is approximately US\$2.5M of which UG is expected to use US\$96,000.</p> <p>The estimate for the entire CKLN project is US\$10.7M. Funding to the tune of approx. US\$8M has been committed by the World Bank, EU, UNDP, OAS, CIDA, CDB and CARICOM.</p> |
| | <p>Construct a multi-media network building to support on-line activities.</p> | <p>Facility established.</p> | <p>Indications are that UG will be required to fund this building.</p> | <p>60,000</p> |

| | | | | |
|--|---|--|---|------------------|
| | Implement continual programme for training staff in the development of on-line courses and the delivery of teaching <i>via</i> the web. | The expected result of this initiative is on-line teaching in at least 10 academic courses and at least 1,000 students pursuing courses. | The University keeps abreast with latest developments in ICT. Tuition fee to be based on full cost recovery. | 10,000 |
| | Automate Library and train staff. | Library system automated. | | To be determined |
| | Develop Software systems to deal with student matters in Registry and Bursary, that are accessible to teaching units. | Registry and bursarial systems computerised by December 2006. On-line registration in place. | Updating of records may have to be contracted out as short term assignment. | 30,000 |

Source: University of Guyana Draft Strategic Plan (2006-2011)

Table 2.INDUSTRY AND COMPETITIVE ANALYSIS-UNIVERSITY OF GUYANA

| STRENGTHS | WEAKNESS |
|--|--|
| <ul style="list-style-type: none"> ➤ Committed Staff ➤ Relatively Low fees ➤ Dominant market share ➤ Server and audio/video equipment to deliver online courses/programmes ➤ Only university in Guyana | <ul style="list-style-type: none"> ➤ Technology infrastructure (not every home has access to a computer or the internet) ➤ The age of the university (50 years) ➤ Lack of accreditation for programmes offered ➤ Special software needed to secure electronic commerce payments ➤ Lack of finance to fund ICT initiative ➤ Few graduate programmes |
| OPPORTUNITIES | THREATS |
| <ul style="list-style-type: none"> ➤ Development of online programmes which can cater for specific needs of customers (students) locally initially and then overseas ➤ Development of a virtual network which can be used by commuting lecturers initially to deliver courses real time to students at the Berbice Campus ➤ Generation of additional revenue through the delivery of web based courses/programmes | <ul style="list-style-type: none"> ➤ Private institutions in Guyana offering distance learning online programmes may develop and erode market share ➤ Global institutions offering distance learning programmes may continue to erode market share |

| | |
|---|--|
| <p>➤ Potential for strategic alliances with institutions which have experience in the delivery of online courses/programmes</p> | |
|---|--|

Table 3. Security Threats and Solutions

| Threat | Security Solution | Function | Technology |
|---|-------------------|--|---|
| Data intercepted and read or modified illicitly | Encryption | Encode data to prevent tampering | Symmetric encryption, asymmetric encryption |
| Users misrepresent their identity to commit fraud | Authentication | Verifies the identities of both sender and receiver | Digital signatures |
| Unauthorised user on network | Firewall | Filters and prevents certain traffic from entering the network or server | Firewalls; virtual private nets |

Source:(Kosiur, 1997)