An Adaptable Business Intelligence Model for Security Organizations

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Abstract
Business Intelligence (BI) shows prospect both in private and public sectors. It answers the questions of how things can be done and what result it holds. It was observed that most of the BI papers have centered on private sector with little or no attention to public sectors like security organizations. With security organizations representing the heart of any society, the need arises for a well-integrated model that could aid security personnel towards an effective security implementation of any society. The paper studied one of the existing and popularly used model in Information System and observed the need to integrate a feasibility study for an effective BI system in the security organization.In conclusion, the paper developed an adaptable model that could help security organizations create better decision system and provision of a data warehouse of information.
Keywords: Business Intelligence, knowledge acquisition, Information and Communication Technology.

1.0 Introduction

Managers and researchers alike have been working to develop Information System that provides business intelligence (BI). BI is "both a process and a product." The process is composed of methods that organizations use to develop useful information or intelligence, that can help organizations survive and thrive in the global economy. The product is information that will allow organizations to predict the behavior of their "competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment" with a degree of certainty (Vedder, Vanecek, Guynes & Cappel, 1999). BI can also be seen as a system that involves data gathering and storage for knowledge acquisition and Knowledge Management with analytical tools, presenting complex internal and external information to planners and decision makers in a simpler form.
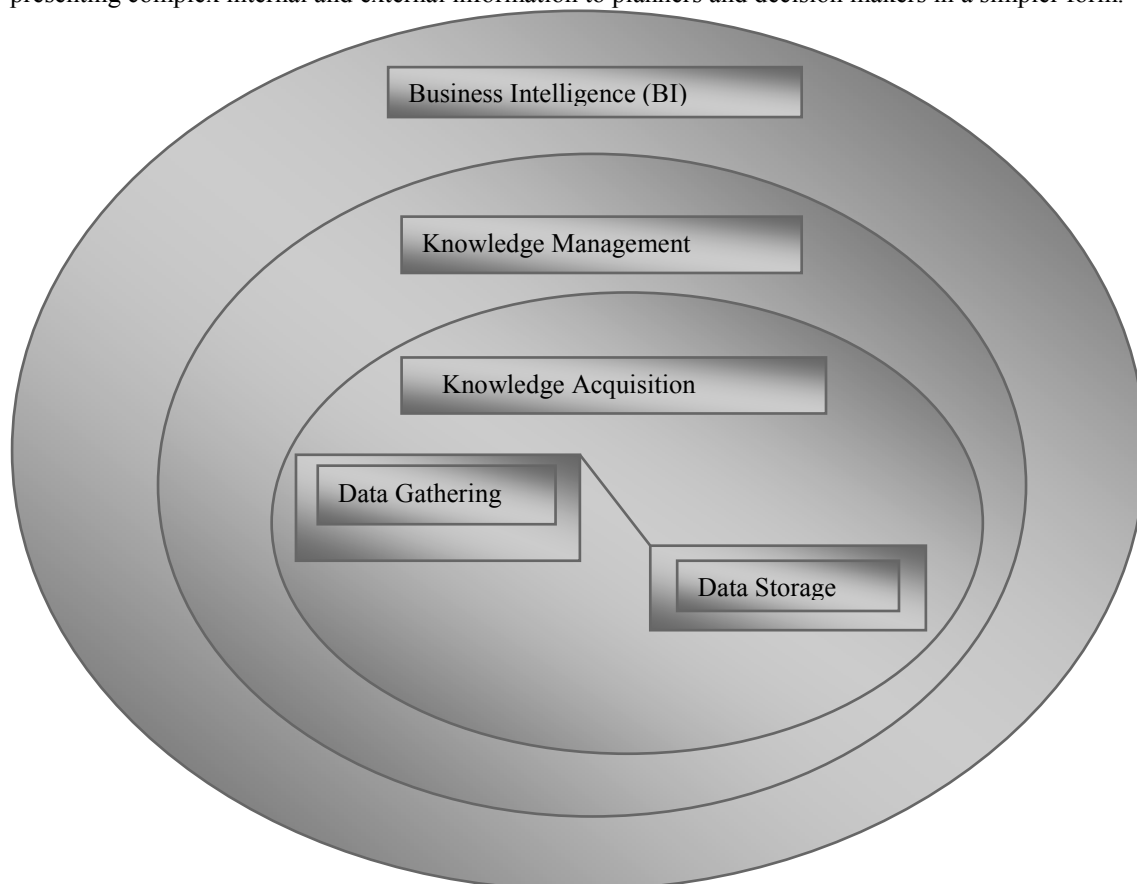

Fig 1: A Simple Illustration of a BI System

Why Business Intelligence system in the ICT world?

Over the past decade, research has shown that Business Intelligence (BI) can be enterprising in some aspects of computing such as Web analytics.

BI is needed in the ICT world in order to be able to analyze data and transform information into an insight that can be used to guide strategic formulation by measuring past activities with the present. This can be achieved by the creation of an easy, accessible and standardized tool for statistics that could be used for command and control, planning and monitoring (decision support system).

Example of a Business Intelligence system is a Data warehouse. Data warehousing is the process of extracting data from disparate applications (internal and external) transforming it into a generic and meaningful format and storing it into a consolidated data repository for business analysis.

The stakes are high for organizations to develop successful BI implementations. Winning companies, such as CISCO, have seen investments in BI to generate increase in revenue and produce cost savings equivalent to a 108% return on investment (ROI) (Cisco, Nigeria webpage 2006). On the other hand, losing companies have spent more resources than their competitors with a smaller ROI, while watching their market share and customer base continuously shrink (Gessner & Volonino, 2005).

In the world today, business intelligence spans many industries and platforms, the concept of interactive intelligence covers activities such as capturing masses of data, directing workflow, sustaining corporate goals and driving real-time performance.

Capturing masses of data: in the Healthcare field, business intelligence has literally made difference between life and death by aiding medical practitioners as they work to control infectious diseases. This has been achieved through keeping structured records of the cause, effect and measures that have been taken in the past, and comparing it with the present and the future.

Directing workflow: BI has been used by organizations or industries like Dangote group to direct progress through close monitoring of policies, production, change in economy etc.

Sustaining Environmental goals: The importance of environmental sustainability is now fore view in the global consciousness due to concern about ecological economics and changes in the climate system. Business Intelligence plays a major role in advancing environmental sustainability as a corporate goal. Organizations now monitor, track and report on environmental impact measures.

Driving real-time performance: With direct marketing, a Telecom industry like Airtel relies on measurement and action to optimize in-process campaign success. Real-time BI information usually spark creative adaption designs to counter issues that could slow down ongoing campaigns.

2.0 Information System success model

In order to organize the diverse research done on IS success factors, DeLone and McLean (1992) developed a model that presents a more integrated and comprehensive view of IS success factors shown in Figure 2. The model consists of six interdependent constructs: *system quality*, *information quality*, *use*, *user satisfaction*, *individual impact*, **and** *organizational impact*.
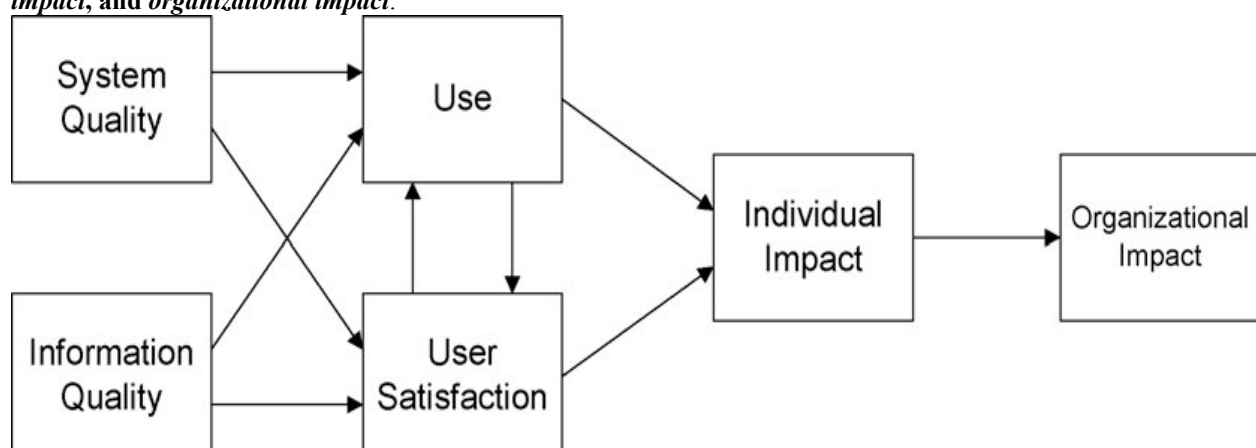

Figure 2: IS success model (adopted from DeLone & McLean, 1992)

- **System quality:** Refers to the quality of user interface, ease of use, quality and maintenance of Program codes, etc. (Seddon, 1997). In this context, system quality can be seen as the flexibility of the type of database design that is been implemented for the system analyst to manage. The ease to carry out operations while avoiding the three major anomalies (Insert, delete and update)
- **Information quality:** This is a survival issue for both public and private sectors and is the fitness for use of information provided and has to do with an aspect of BI known as Data Analysis which is about

synthesizing useful knowledge from collected data.

- **IS use:** Refers to the use of system in carrying out effective and efficient task and activities (Seddon, 1997). This also can be measured with the level of DBS language being implemented.
- **User satisfaction:** In a given "situation is the sum of one's feelings and attitudes toward a variety of factors affecting that situation" (Bailey & Pearson, 1983).
- **Individual impact:** Refers to performance improvement for the user. It is "an indication that an information system has given a user a better understanding of the decision context, has improved his or her decision making productivity, has produced a change in user activity, or has changed the decision maker's perception of the importance or usefulness of the information system" (DeLone & McLean, 1992).
- **Organizational impact:** Measures the impact that the use of the system has on the overall performance of the organization.

A critical study of the DeLone & McLean model revealed that the model is more profit-oriented, where users' satisfaction stands to attract more revenue to the organization. A good adaptation of this model in private sector will boost the BI technique in the organization which in return, will yield positive result to the investment of the organization. Furthermore, the model will not be a promising one for public organizations like security organizations.

DeLone & McLean model lags in public sector (security organization) in the sense that, it does not include evaluation process through feasibility study before the final implementation.

Security is one of the pillars of success in the economy of any country. A society without a good security measure stands to crumble in economy while leaving the masses insecure. Thus, the need arises for Business Intelligence in the security sector of any society.

3.0 Related Works

Ranjan (2009) opined that it is imperative that firms have basic knowledge of some factors (such as customers, competitors, business partners, economic environments and internal operations) in order to make effective and good quality business decisions. He also added that BI enables organizations in making well informed business decisions and can be the source of competitive advantages.

Fields and Sheppard (2013) argued that the old BI models are slow and resource-intensive. Their study proposed six attributes of a rapid-fire BI solution as Speed, Self reliance, Visual discovery, large and diverse data, Ubiquitous collaboration and flexible configuration.

Sell, Cabral, Motta, Domingue and Pacheco (n.d) argued that despite the importance of analytical tools to organizations, they still lack the inference skill of solving the requests of decision makers in a flexible way. The aim of their study was to integrate business semantics into analytical tools by making available semantic descriptions of exploratory functionalities and available services.

Grabova, Darmont, Chauchat and Zolotaryova (2010) opined that most studies that have been conducted on the need for decision support system for small and middle-size enterprises adopted existing solutions and approaches that are appropriate to large scale enterprises, this results to high price, redundant functionality, complexity and high hardware and software requirements when been used in small and middle-size enterprise. The main aim of their study was to design BI solutions that will be suitable for small and middle-size enterprise and thereby do away with the above mentioned challenges.

Davis (2006) looked at right-time BI as the means of delivering the right information in the right format to the right people at the right time for decision making purposes. Their study looked at the steps to implement right-time BI solution. The outcome of their study highlighted the significance of right-time business intelligence as another operational system that adds value to businesses.

These processes will help our security organization to be able to build a system that will enable them forecast the future with the past events.

4.0   Security Organization BI System Model

To demonstrate this, the researchers introduced five major constructs for a proper security measure strategy. These are as follows: information gathering, information scrutinizing, planning, feasibility study and control.
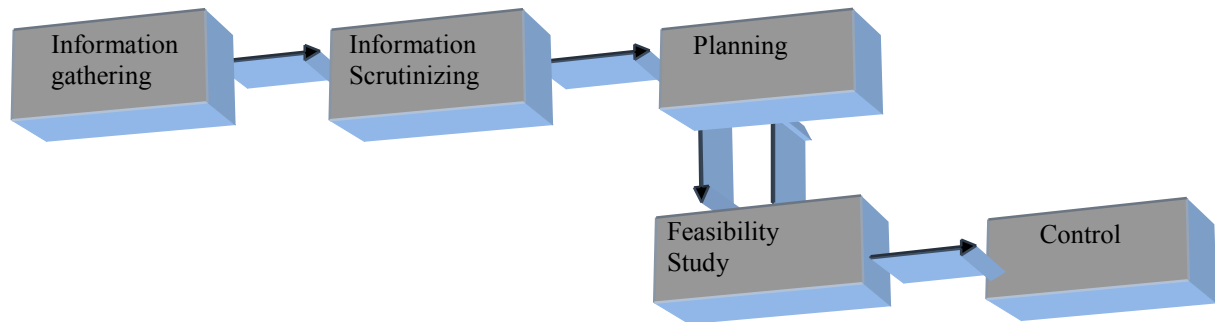
Figure 4: five constructs for a proper BI security measure

Information gathering: this process involves a good communication strategy which will be employed as a means of understanding the environment. A good communication strategy when deployed will help the security team acquire usable information from individuals including defaulters. The method of information gathering may involve the use of questionnaire, personal interviews or group interviews.

Information Scrutinizing: it is important to properly examine the gathered information by separating them into parts. This will enable clarity and exposure of any form of disparity, which will inform the decision of working with the data or discarding the data for another information gathering.

Planning: this involves strategizing security measure as against the convinced outcome of the gathered information. This process entails proper linking of analysis with the security measure.

Feasibility study: this is the most important aspect that informs the BI operation in the security organization. It involves the total overhauling of the implementation process as against the day to day environmental operation of the area into consideration. Should any failure be observed, the first, second and third constructs are subjected back to scrutiny.

Control: this entails the final implementation of the security measure once the feasibility test satisfies the embarked process satisfactorily. In essence, the final security implementation will not be made obvious to the public until the feasibility test has being satisfied.

BI strength in Security Organization
With the use of business Intelligence system in security organizations, the analyst can find out where and when crimes have occurred and can also get a forecast on where future crimes are likely to occur through:

- **Creation of better decision support system**: This will enable proper decision making through easy access to standardized statistical tools for determining cause, monitoring, planning and control through comparison of the present with the past.
- **Provision of a data warehouse of Information**: This will provide access to data both previous and new entries, thereby forming the basis for monitoring of progress.
  It is also possible to see where, when and how incidents have occurred and based on this   information, choose a mode of action.

5.0 Conclusion
Business Intelligence can be applied to the following security needs in order to drive a good security implementation:

- **Measurement**: program that creates a level of performance matrix and benchmarking in order to enable security personnel evaluate their success towards a good security measure.
- **Analytics**: program that builds quantitative measures to arrive at optimal decision and also in the discovering of security technical know-how. It includes data mining, statistical analysis and business process modeling.
- **Reporting/ Enterprise Reporting**: program that builds infrastructure for strategic reporting to serve the strategic management of business and not operational reporting. Examples are data visualization and executive information system.
- **Collaboration/collaboration platform**: programs that get different areas both inside and outside to work together through data sharing and electronic data interchange.
- **Knowledge management**: program to help formulate strategies for an organization through practices to identify, create, represent, distribute and enable adoption of insight and experience that are true business knowledge.

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