Managing Strategic Information Systems: A Systemic Perspective

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Abstract

In this study the general systems theory (GST) depicted in a universal system language will be applied to the concept of managing information systems in organizations. This study will show that the concept and science of ‘strategy’ is very much associated with the systemic view which is enshrined in the general system perspective i.e. Islamic world view. This means that there must be a fit between the technology and its philosophy and the strategy and tactics approaches used in organizations to achieve long term competitive sustainability which is associated with strategic management. This study will provide a unified approach (universal system language) to integrate management and its decision making and organizations and their information systems using strategic scientific terminologies.

Introduction

Strategic management was and still one of the most important strands of management. Strategic information systems thus derived its importance from strategic management and from the strategic role played by Information and communication technologies (ICTs) at the individual, organizational and societal levels. Furthermore, the GST has been grounded in Islam and which renders ICTs (philosophically congruent with GST) an appropriate technology for Muslim nations and the world at large. These factors together necessitate the integration between strategic management from one side, and information systems on the other. The study will indicate clearly that the system science is the appropriate language to conceive strategy and strategic thinking. Furthermore, GST is the basic model to represent all strands of management that are associated with strategic information systems.

Philosophical and theoretical Underpinnings
The general system theory initiated by Bertalanffy and has been redefined by (Higgo, 2009) to accommodate universal principles. This depends upon natural structure shared between living and non-living systems and which has been shown to be associated with Islamic theory of thought (Higgo, 2009). This shared structure contains (7 layers – levels, 5 elements integrated in a circular fashion – cybernetic model – and dual structure). This constitutes the language of systems and it is proven to be universal unlike the language of mathematic which is linear reductionist and partial. This is why mathematical language is unable to represent systemic reality which is part from the universal systemic language. However, these concepts are superb in terms of defining requisite and optimal structures and processes of organizations and their information systems together with their management. This means the GST, depicted in a universal system language, to perceive information systems, their organization, and their management from a unified approach (systemic, Islamic reality). However, the cybernetic model has been developed by Beer (1984) to chase organizational viability; which somewhat constitutes one element from the GST. Nevertheless, the GST theory addresses viability, sustainability, learning and globalization. Moreover, this framework of structure and process can be conceptualized in modeling terms; i.e. it can model any kind of phenomena. The model thus defined, will be applied to explain strategic aspects and will be extended to perceive and redefine how support is provided in organizations. Furthermore, management, in strategic sense, will be redefined; when applying this model to organizational decision making i.e. institutionalization of actions; as decision making itself, core of management, will be perceived from a systemic perspective (Higgo, 2010). Thus theory and practice of the GST can be perceived from scientific innovation to cultural integration. In this sense, GST can be perceived as a competitive business model for the Muslims and it is a gift from Almighty ALLAH (SWT) to humanity at large.

System’s Boundary

The system’s boundaries are a widely used concept (Churchman, 1965). Also decision makers as people have limited processing power (Miller, 1966) and they have to adopt a rational and bounded approach (Simon, 1967). This is why people will not work in an open space, and they need to constrain their actions by drawing boundaries around their decision problems. Working in an open space is not something possible for human beings, because of their sheer limitations to conceive and conceptualize open-ended situations. This is why in order to act in real life situations; one has to draw a boundary. This is also reflected in the biological and physical systems which are created by Almighty ALLAH (SWT) to show the optimal and requisite way to human designs and actions. The setting of boundaries around any phenomena reflects holistic and dynamic imperatives in terms of coverage and scope. The choice of a requisite boundary is a focal point for strategy. The choice of the boundary is problematic as it separates the internal environment from the external environment. Internal environment can somewhat managed with limited control possible. However, the external environment can only be regulated via proper interactive processes. This means that a viable, enlightening post-post modernistic approach is
needed to provide full scope and manifestations. However, the structure of the language used in strategy is dual (internal and external environment; strength and weaknesses). This means that not only the cybernetic model of the GST is used to conceptualize strategy; but also the dual structure. Also the requisite structure of the organization has to be based upon seven levels to reflect systemicity that we find in the human body as well the layers of network systems.

**Strategic thinking**

Dealing with the internal environment with regard to weaknesses and strengths, and with the external environment in terms of opportunities and threats, has to be tackled via strategic thinking (Porter, 1984). This means that without the concept of boundaries, it is hard to deal with strategic thinking. This means that all those who advocate strategic thinking must be in way or another, systems thinkers. This means that statistical data has to be converted into information systems to provide information about the past, present and so expectations about the future reality. Using the GST makes it easy to learn intelligently, to perceive, conceptualize and act. Strategic thinking is needed for balancing actions and reactions, and for sustaining and guarding turbulent environments. In this sense strategy is an instrument to carry out actions to achieve and substantiate the goals stated clearly in a strategic plan.

**Standardization**

The universal system model depicted in Figures (1, 2, 3, and 4) is unique in dealing with local as well as global phenomena simultaneously (cybernetic model based upon bounded elements in term of wholes or parts). Thus interpreting information from the internal environment using the five functions of management model; which are modified within the universal systemic model will render a standard approach based upon systemic imperatives. This model will result in regulating the internal environment of the organization and will enhance the process of interacting tactically with the external environment. For example, one can deal with competition in a tactical way; but your ability to compete in turbulent environments is strategic. However, when applying the GST as standard model we are going to achieve sustainable competitiveness. For example, figure 1 show how strategic management can be triggered from strategic planning, building organizational structures, coordinating between units, sections and departments; and controlling the planned against the actual. While decision making is the core for strategic management as it is prevails in every other function. Figure 2 show how the strategy begins the sales and marketing department and follow the cycle to end in the sales and marketing department again. This circularity reflects viability, sustainability and learning and shows that strategic management is a cyclical and on-going process of continuous improvement and enhancement to seek perfection in the internal environment actions or when dealing tactically with the external environment. Thus this circular and cybernetic model represents any
managerial and technological phenomena and in strategic fashion. Thus it is a post-post modernist approach to perceive reality and propose strategic solution to its problems.

**Reconceptualizing the strategic support**

Thus information systems and their roles have to be redefined. The universal model must be used to guide the analysis, design and coding i.e. the development process. The intelligence of the information system is not by using artificial intelligence to develop closed types of support systems but by using an intelligent model that well-suited to deal with and interact with the internal as well as the external environment of organizations (here not only the information systems but also both management and the organization are perceived from a systemic perspective). The role of the information systems with regard to their organizations is of an organic nature (a system within a whole supra systems) Achoff (1967). It plays the role of the central nerve, and the nucleolus to the cell and atom. Even the statistical data and statistical tools must be perceived as systemic instruments (Higgo, 2011b), analyzed in a proper way to provide strategic support. The information systems department must be able to generate a lot of varieties (tactics) to defend the system in times of turbulences (Ashby, 1964). Organizations have to resort to their information systems to find intelligent solutions to internal and external problems. Attention must be paid here to the boundaries stated in these systems; including the information systems. Thus developing and managing information systems from a systemic perspective makes it easy to transfer knowledge and hence actions from one context to another and makes the whole process a unified whole. However, it is important to note that (ICTs) are systems that are based upon the GST. For example the network systems is based upon 7 layers, the computer system (Cybernetic) is based upon 5 elements integrated in a circular way and the whole technology is based upon the dual or binary structure (0,1); which used to be called the digital era.

**Reconceptualizing management**

The Western mechanistic management approach depends upon individualism. Individualism is a way of life in the West and very much influencing management theory and practice. Thus it is part of the western culture. However, in Muslim countries, and in Sudan in particular, people see themselves as a web of relationships; and collectivism is the basis of culture and the basis of cultivation in land and buildings e.g. ‘Nafeer’. This is, in fact is based upon and determined by the teachings and doctrine of Islam. Thus collectivism and collective value system has to be perceived from the Islamic world view. Islam, the universal religion that determines their code of behavior and this is where the GST has been generated. Thus imposing the traditional management approach, which relies upon and generated from the individualistic culture, will
lead to cultural clash. Special emphasis and attention must be paid to the philosophical and ideological underpinnings before applying management theories; this is in addition to psychological invalidity and fallacy of the mechanistic approach (Higgo, 2011a). Thus management science approach in Muslim countries and in Sudan particularly, must be based upon system science that is based upon the GST. The right management approach must be based upon managerial and business functions after being reorganized (systemized) using the GST. Thus the other traditional management approaches are completely irrelevant to be taught in business schools of Sudan and Muslim Countries alike; and even more when it is used in conjunction with management of strategic information systems. Thus the general system approach represents a philosophical shift or a new paradigm compared with the traditional approach. This approach models both parts and wholes using a unified language and then integrates parts and wholes where fast and hard achievements can be attained. Thus it is legitimate to ask that we need to redefine management which is associated with the concept of control to a more of regulating in a dynamic fashion. However, management has to deal with both the internal as well as the external environments. This rejects decision support systems using traditional models that chased only well-structured types of problems, and within stable environment, in a reductionist manner (Higgo, 2010). Nevertheless, using artificial intelligence to develop expert systems- a closed type of systems- to claim to produce solutions to problems using past experience to cast and resolve new problems in new environments; is a fallacy. However, the proper approach is to interpret information internally and external using a managerial model which is equipped to deal with the internal as well as the external environments given the requisite and proper modeling instruments. This is the strategic visions which will be integrated with the organization’s strategy and provide us with a valid model to link internal and external aspects of management, and to regulate organizational actions and reactions. However, strategy is widely accepted as the capstone that integrates the different functional fields of management. Without standardizing and conceptualizing from a systemic perspective (i.e. GST), integration will not be possible. Nevertheless, integration will lead to value added in terms of excellent products and services, competitive prices and stakeholder satisfaction. The four figures below show the systemic models of management and the organization. The decomposition of the decision making (central function) has produced the decision making system; while the decomposition of the information systems (central function of the organization) has produced the information system model. Thus the four figures are interrelated and very well interconnected. Thus they can be integrated to form a complex whole in reality and in the minds of managers and decision makers; together with new cultural values emerging. Thus the figures from (1) ……to (4) illustrate that not only the managerial functions, the functional fields of business, the functions of decision making and the information systems tables can be integrated in a circular manner; but also all these functions can be integrated as they are generated philosophically from one base i.e. Islam. The universal religion that unifies the whole universe via the GST.
Conclusion

This paper links strategic management with the universal system language; i.e. linking strategic thinking with Islamic theory of thought. The role of management, decision making, organization and their information systems has been redefined. Management has been redefined from the classical notion of ‘control’ in an exclusive manner; to be associated also with a more flexible approach ‘regulation’ i.e. control is one of five elements of management. This occurs as management needs to deal with internal and external environments of organizations. The universal system model has been shown to be valid to develop organizational systems together with their information systems and in addition to offering a philosophically distinct approach to their management. Furthermore, strategy and tactics has been reconceptualized and integrated with this vision to chase ill-structured and messy types of problems and to sustain organizational goals. These kinds of problems may emerge locally or globally within the context of strategic management. This study is intended to deliver a new type of culture that is associated with systems science and technology based upon the newly developed model of the general systems theory. Thus in this study, we have integrated various instruments of systems to attain a sustainable complex whole which will have local and global consequences and implications. Also this study confirms that the GST is strategic organizational phenomena; capable of putting various parts together. And hence will make the unity of science a reality.
References


Higgo, A. (2004), System thinking theoretical grounding, conceptual clarity and Islamic roots, King Abdel-Aziz Islamic journal, vol.17, No. 3.


Appendix

Figure 1 Managerial functions organized systemically (managerial systemic theory)

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Figure 2 decision making elements organized systemically (decomposed from Management and thus show the process and the interrelationship among the components)
Figure (2) shows how strategic decision can be conceptualized, alternatives are generated and a choice is made. This happen with multiple feedbacks between the centre and other parts.

Figure 3: Organization functions perceived systemically (cybernetic model)
Figure 4 information systems database perceived as a cybernetic system (decomposed from the organizational functions)