A Hybrid Viable System Model: A Proposed Model for Business Decision Making

Dr. Raed Alqirem*   **Dr. Nawaf Alghusin**

Abstract

Viable System Model (VSM) provides a comprehensive form of collective behavior in our globalized knowledge-intensive societies. The situation now arises that information systems are nowadays at threat from market characterized by rapid business change, uncertainty, and intense competition. What is needed is a significant and effective system that influence firm's outputs and inspire decision-making. The aim of this paper is to suggest a theoretical framework of the hybrid viable system model to specify sufficient conditions of businesses for viability.

Keywords: viable system model, decision support systems

I.   Introduction

Recent advances in information systems and their interactions with fluctuations in a business environment produced new ways for gaining competitive advantage. These rapidly sustainable changes present complex problems that a manager has to face today. In order to address the above issues, new systems are required.

VSM has been used widely in research to diagnose existing business structure and design. It is the nature and characteristics of VSM that allow VSM to be used in different situation (Warren and Hutchinson 2003; Bititci et al 1999). The VSM as shown later in this paper has five management functions that include many aspects of knowledge, which must be considered as a whole by businesses and decision maker. It helps to balance the details with attention to relationships among these functional parts, and their integration into the whole picture. Businesses and individuals are all faced with the need to constantly reinvent themselves to adapt to the changes in the environment. Therefore, there is a need to be combined to a decision support system to improve the relations among these parts as well as within them because knowledge about how to analyze problems and solve these problems is a whole system issue. Although VSM is considered to a wide range of scholars a powerful tool for understanding operations and enhancing effectiveness and efficiency, some studies found that VSM in some cases would considered an invaluable tool for targeting the root of the problem in order to discover remedial action needed (Burgess and wake 2012, Vidgen 1998). The aim of this work is to propose that integrating DSS tools in VSM functional part (S4) would give a significant impact in allowing the decision maker to get a deeper insight into the business and reflects the philosophy of decision support systems in focusing not only on assessing the alternatives, but also on the formulation of the problem and analyzing the decision analysis result (Power and Shrada 2007, Turban et al 2005, Swanepoel 2003).

II.   Literature review

II.1 The Viable System Model (VSM)

The VSM has been used as a computing tool to investigate the systematic context of processes in an organization, and to reconfigure the use of their   for decision-making. The VSM founded by Stafford Beer based on the principles of cybernetics. This model has been successfully adapted by many researchers to diagnose existing organizational structure and to develop and create new ones (Azadel et al 2012; Bititci 1999). The VSM consists of five

interrelated subsystems shown in figure (1). Each subsystem represents a certain function of VSM (Beer 1985, Vidgen 1989, Azadel 2012). These functions are:
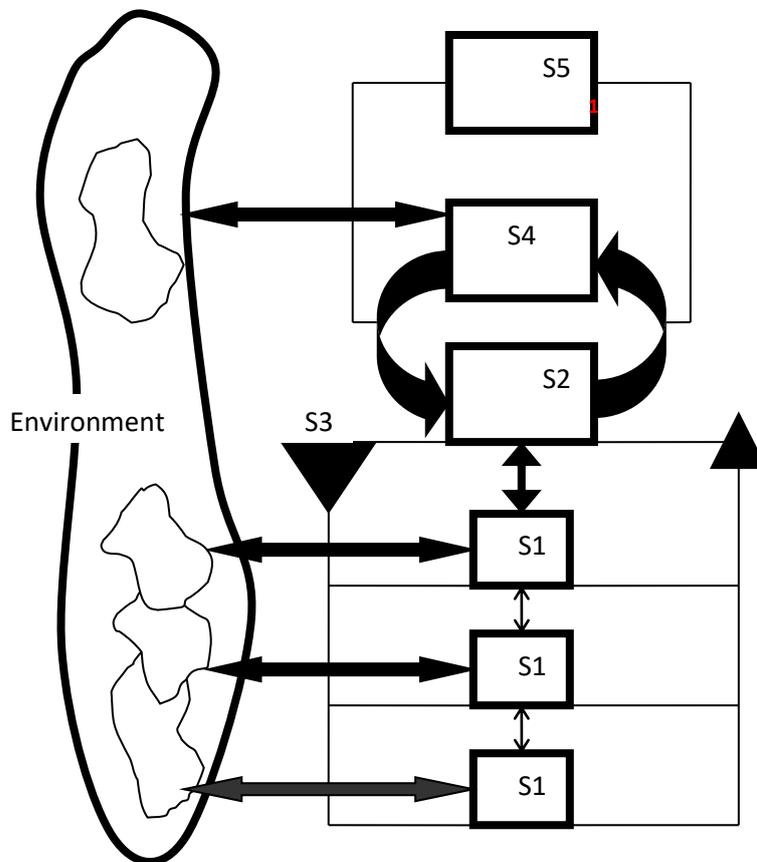

Figure (1): The VSM Structure

System one (Operation): This system carry out the operational business process in the organization. It is the system that interacts with both the internal and external environment, and record the information flow across them. S1 observe and record the daily and routine activities and processes in the organization. It considered the powerhouse of the organization, as their units are actually the units that do the business.

System Two (Stability): This system ensures that all the operational units (S1 units) act in the best interest of the whole organization. It is responsible for ensuring stability between operation departments and units by coordinating their activities.

System Three (Control): It considered as the audit function in the organization that monitor and help S2 with information shortage problems. It is the everyday control as it sits right in the middle of the operational activities, giving ideas about to relocate resources of people and money to eventually improve the business performance.

System Four (Intelligence): It is the development management in the business that ensures the strategic planning and the policy makers are adequately briefed with all the business process inside the organization. S4 transmits information and decision made to S3. It is also linked to S5.

System Five (Strategy): This system's main function to direct and manage the whole business, and balance between internal and external factors. It is the ultimate authority and the senior management that monitor all the business by its policies and rules and the system that build the organization's identity.

II.2 Decision Support Systems (DSS):
The decision support system is a computerized information system that gives support to the manager in the decision making process to solve the encountered problems. Typical characteristics of DSS application are (i) it provides easy access to data in the real time situations, (ii) analyze these data using intelligence tools, and (iii) allows the decision maker to interact with a user-friendly interface in the data analysis process (Oquendo et al 2000, Bakhrankova 2010, Turban 2005, Pehrsson 2013, Power 2008).

DSS consists of four subsystems: (i) data management: it is managed by the database management software (DBMS) which is a software kit for managing data in database. Its tasks are to capture internal and external data, and store it in the data repository to be used when needed to make decisions, (ii) the model management, which is managed by the model, base management subsystem (MBMS) which creates, store, and update models (Sarimveis et al 2008, Brans et al 1998, French 2004, Brehmer 1998). The MBMS assist the decision maker (USER) to choose the appropriate model and adapt it to solve a certain problem, (iii) the knowledge base management subsystem (KBMS) which provides the DSS with the experience and knowledge of how to choose a desirable model. This subsystem is a necessary component as it provides the DSS with intelligence of how to generate, collect, disseminate, and use knowledge to solve problems. Finally (iv) the user interface that allows interactive communication between the user and the DSS application. It is the one component of the DSS that the decision maker interacts with to analyze problems and display the results.

Many researches in this field focused on using DSS in a combination with appropriate effective methods to achieve greater flexibility and effective decisions in businesses (Sarimveis et al 2008, Brans et al 1998, French 2004, Brehmer 1998). Furthermore, DSS literature comprises two main classification: data-based DSS which is based mainly on data mining to create rules, and model-based DSS that emphasize simulation and business intelligence models (Loebbecke and Huyskens, 2009; Pearl, 2000; Bakhrankova, 2010).

III.   The proposed Hybrid viable system
The aim of the proposed hybrid system is to eliminate the risk factors affecting the organization, reduce risks, and responding more efficiently to the fluctuations in business environment.

Beer (1985) argues that organization of viability has a generic character and that this character is invariant to the particular embodiment. 'The question of organizational structure is the most important. If the structure is dysfunctional, then no amount of financial wizardry, of insightful man-management, of business techniques, will save the day. Increasingly, it seems to me, the organizational structure we inherited do not work' (Beer 1985).

VSM as proved by many researchers a powerful tool in analyzing the organizational structure, but VSM in some cases would considered an invaluable tool for targeting the root of the problem in order to discover remedial action needed. Therefore, it is important to

analyze the   opportunities and threats more effectively, and this is our aim here is to show that integrating DSS tools into VSM will cure this issue.

On the other hand, there are issues have been unveiled in most DSS regarding manufacturing businesses. Some of the past research found that DSS in some cases lack to analyze the flow of raw materials in manufacturing system probably and do not address the flow of these materials in the system which causes poor performance and low resource utilization in the system. Another problem of some kind of DSS is the difficulty of integrate these systems with the entire organization's information system (Kasie and Walker, 2016, Mallya et al 2001, Ni and Jin 2012).
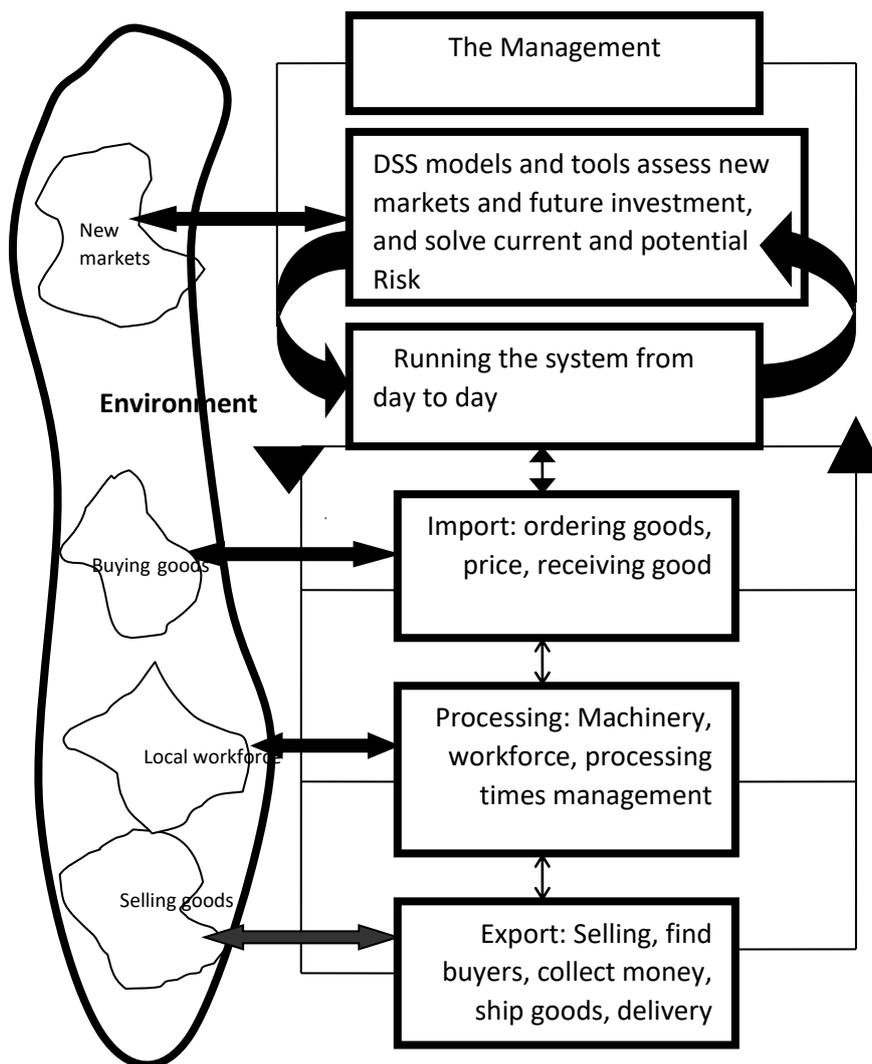

Figure (2): The proposed hybrid system

As shown in figure (2), the above hybrid system of VSM and DSS proposed a solutions to the previous drawback in both VSM and DSS. This solution emphasize the role played by system four in VSM, to transmit information from S1, S2, S3 by which it means to record the daily business transactions.

System two will be responsible for running the system day to day, and will be under supervision of system three.

System three as mentioned before help S2 with information shortage problems, giving ideas about to relocate resources of people and money to eventually improve the business performance. This information from the VSM parts (S1, S2, and S3) is transmitted to S4 to be analyzed.

As mentioned before, system four is the development management of the VSM, which analyzed the information transmitted from other VSM parts and make decisions, and provide the senior management S5 with the analyzed decisions for the purpose of strategy planning. It also informs other VSM systems of the decision made.

The proposed hybrid system incorporates nine major components, namely, VSM, s five subsystems (S1, S2, S3, S4, and S5) and the DSS, s subsystems (DBMS, MBMS, KBMS, and the interface). The DSS integration in VSM, s system four is a novel and powerful suggested approach that will allow the decision makers in system four to explore different scenarios and assumptions to the proposed decision before transmitting these decisions and information to system five. This integration will address and cure the previous drawbacks in both VSM and DSS.

In this respect, the proposed system will be able to provide a tools of observing the structural content, constraining people, structure processes and relations.

The aim of this proposed hybrid system is to allow the decision maker in the organization to get the benefits of two significant methods at the same time and to combine between them in a parallel and cooperative manner. integrate DSS tools will address the problem with VSM and will allow the manager to use the DSS models, past knowledge to enhance the analyses of the organizational structure, and to develop new analytical tools to the manager in system four to help him in assessing new markets and opportunities, analyze future investments, and solve the current problems more effectively

IV.   Conclusion, implications and future research

Understanding businesses, as an integrated completely is a robust platform for various kind of change, the proposed hybrid system illustrates the idea of change, and the benefits of that change.

This paper has assured that the viable system model has really the advantage of being flexible to any changes. The theoretical framework in this paper presented a new hybrid information system, a system that combines two powerful analytical methods capabilities together to understand the business, redesign it, and solve problems in an intelligent form in two potential means.

First, with the existence of VSM intelligence function which is a two-way link between the operational units and external environment, the hybrid system will be intelligent to provide the operational units with feedback on potential risk, markets, technology and all external factors that are likely to be relevant to the business in the future and the capabilities to analyze these factors.

Secondly, the hybrid system is strongly future focused. It will be capable of planning ahead in the existence of changes and complexity, to do so, the hybrid system provides the business with appropriate data and models that matches each potential problem.

As with other conceptual research papers, the expected research findings is limited, as so far we have focused to introduce a new system model.

A suggestion for further research is to investigate whether the proposed viable system model holds managerial and practical advantages to business. Future research is encouraged to explore hybrid viable model, and it is direct, indirect and interactive effects of business processes and activities.

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Authors

Dr. Raed Alqirem*
Faculty of Business, Al-Zaytoonah University of Jordan, drraed@zuj.edu.jo

Dr. Nawaf Alghusin
Faculty of Business, Al-Zaytoonah University of Jordan

*corresponding author