Management Information Systems Research for Small and Medium Enterprises: A Sustainability Perspective

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Abstract

The management information systems (MIS) research and its significant contribution towards small and medium enterprises (SMEs) improvement is analysed via sustainability. Corporate sustainability along with its business significance is highlighted from new entrepreneur perspective. SMEs and their susceptibility in this modern era with sustainability, call it sustainable SMEs (SSMEs) is addressed. SMEs and their opportunity to work with large-scale organization with the help of computer based systems is highlighted. Finally presents an insight of MIS research towards SSMEs.

Keywords: Small and medium enterprises (SMEs), Sustainability, Management information systems (MIS)

1. Introduction

Over the years, the business environment has become extremely complex and highly integrated, resulting a sudden rise to the numerous business functions and operations at the workplace. Primarily a huge volumes of data that is being generated every day, along with managers experiencing difficulties in making effective decisions due to these complexities [9, 10]. At the same time, the management function is increasingly experiencing the challenge of keeping track of all the diverse organizational resources, numerous business activities, as well as in monitoring the entire business process and the huge order-turnover processes. In response these, most of the modern businesses have established information systems (computer based), which help keeping track of all their activities right from the planning stage to the delivery of value to the final consumer in the product market [5].

As a result, a highly competitive entrepreneurial atmosphere demands that managers should be clear concerning aspects of the business, should plan effectively, and should be in position to make fast smart business decisions at each stage of the operation chain in order to succeed [10]. This has gradually led to the evolution of the Management Information System (MIS), an advancement in computer based systems, as a software tool for supporting the decision making function of the organization; many studies have highlighted the multiple benefits of the MIS as a decision making tool of the organization.

Over the years, this MIS has taken part in improving productivity, quality and many business aspects start quickly contributing significantly for the modern corporate world.
However, it also starts carrying some limitations due to fast changing marketing and business trends; which are beyond the scope of this research. At the same time, the research and development of MIS is also fine-tuned, incorporating certain environmental issues, addressing the modern business world. Automation and work environment has become a significant part of the modern corporate world. Computerization of several routine tasks and echo friendly work environment has surfaced several new facets to modern businesses.

However, it is an undeniable fact that the continued deterioration of natural environments in the modern global business era poses greater risks as well as opportunities for the present businesses, which further underpins the need to fine tune the organizational thought processes towards sustainability [7]. In that respect, modern organizations are facing yet another crucial challenge of generating decisions that focus on sustainability and innovative environmental strategies, thereby leading to the evolution of the modern Sustainable SMEs that are fine-tuned towards social responsibility as well as sustainable development. The SSMEs research is still growing, thereby increasingly highlighting the modern SSMEs focus on environmental responsibility as well as technology up-gradation for strategic business advantages. Generally, environmental responsibility encompasses the measures to reduce, recycle material, while technology up-gradation entails the use of computer based systems such as the MISs among other innovative tools. A vast proportion of literature covers the contributions of the MIS to the establishment of SSMEs; for that reason, this present study will explore the Management Information Systems research and its impact on Sustainable Small and Medium Enterprises (SSMEs).

2. The Management Information System concept for SMEs

There are numerous definitions of the MIS concept but all of them reach consensus that the system provides information, which supports the decision making function of the organization [8]. The MIS has been around for nearly two decades, but it has evolved to encompass the growing information technologies, thus, in todays’ business context, MIS is a computerized business processing system that generates information that is vital for the organizations’ decision making processes, for the aim of achieving business goals [12]. The MIS is central to the functioning of the organization because it collects raw data from various ends, converts it into useful information, and sends it to the parts of the organization that need to benefit from the said information, thereby fulfilling the information needs of individuals, teams, and management respectively.

The MIS generates different types of information such as descriptive, diagnostic, predictive, as well as prescriptive information; descriptive information identifies the present conditions thereby partly helping in identifying the problems. Diagnostic information measures the disparity between “what is” and “what ought to be” while predictive information is concerned with the possible future trajectories or outcomes; the prescriptive type of information provides answers to what should be done to address the problems the organization is facing. In that respect, the MIS provides the organization with effective past, present, prediction information that is vital for the efficient running of the organization. Therefore a typical MIS system in the organization today is a computerized database of financial information organized and programmed to produce regular reports on operations for every level of management in the organization [2].

The MIS plays a crucial role in the organization because it becomes increasingly challenging for individuals to decipher crucial information from the vast data collected by the organization with clarity and conciseness without the help of computerized systems. The MIS
eliminates the possibility of human error in terms of completeness, accuracy, validity, timeliness, as well as value of information in the analysis and evaluation of data that is significant for key decision making in the organization. In that respect, an effective management information system makes it easy to handle large volumes of data, to confirm the validity of information, process and analyse complex data giving multi-dimensional views; furthermore, this system enables the quick search and retrieval of data, mass storage of data, fast communication of information as well as quick responses to the constantly shifting needs of information.

Among the MIS concepts for SMEs one need to analyze the information from three different perspectives as detailed below.

A. Value of Information for SMEs: The value of information is very essential for a new entrepreneur while setting up his/her business. For example, the information pertaining to the strategic location of business, existing competitors and the social community. Therefore an entrepreneur should possess preliminary knowledgeable about the product, place and location such as climate changes and natural sources availability at the business location. Information is always dynamic, keep changing, might impact the initial views of the entrepreneur, to remain competitive in the changing market. Most of the times the value of ‘information’ is implicit rather than explicit, results in a chain reaction. For example, information support business decision, these business decisions demands actions, and finally these actions affect business achievements, which help determining the organizational performance.

B. Information as a software tool for Entrepreneurs (Intelligent Decision Making): This information is fed in to the computer based systems (results in software tools) and make use of them for decision making. For example, one often comes across process and product tools, for improving the productivity and quality of the business. Sustainability issues like climate changes, use of renewable energy sources, etc, come under the umbrella of business process, for new entrepreneurs. These software tools (enriched with information) ultimately designed and used based on the economic feasibility of the business, aiming towards particular business goals.

C. Sustainability Information for SMEs: This information is basically required for young entrepreneurs for two main purposes viz., for smooth transfer of business from one generation to the other, and to remain competitive in the volatile market place; as a long term business strategy. This information is essential not only to corporate employees, but also to the business and resources. Sustainability coupled with technology is definitely essential for long term viability of the business. Therefore design of MIS for modern SMEs should primarily include three levels of information viz., Organization level, Application level and User level [3][5].

3. Sustainability and Modern SMEs: A Bridge for Future Generation SMEs

Given the increasing global attention on complex business challenges such as climate change, and the contribution of business operations on the gradual deterioration of the natural environment, the concept of sustainable development has taken a central position in organizational strategies [6]. The concept of sustainability has been taunted as the effective management tool for addressing the combined challenges of climate change and sustainable
business development all over the world. Businesses have to consider sustainability factors in their plans and incorporate them in their operations by adopting the management techniques that help in the planning, organization, and overall control of operations to promote both the business, environmental, as well as societal needs. The MIS is very significant in the establishment of innovative environmental strategies that enables the organizations to tackle the complex challenges besetting their effective operation in the face of the complex market dynamics.

In this modern era, even the small businesses inevitably engage in the conventional business functions of consulting, marketing, sales, research, and communications, among others, thus, MIS has become an integral part of the small business operations [1]. The prevailing MIS research highlights that a vast majority of SMEs have established large computer networks on which they display substantial databases that support their decision making functions to promote sustainable development. Precisely, the MIS research has increasingly become a critical tool for the sustainability of SMEs since it has been established beyond any reasonable doubt that every business needs to have an effective information system in place, to help keep track of all the business functions and operations. Sustainability is a crucial aspect of the SMEs movement, especially given the heightened awareness of the potentially detrimental effect of human actions on the natural environment. For instance, destructive weather events such as earthquakes, tsunamis, and floods, among others have all been attributed to the damaging impact of human actions in the drive for entrepreneurship, and this has led to the growing emphasis on the concept of SSME in the corporate world.

In the context of sustainability, SMEs should take a non-economic stance by focusing on better living and environmental improvements. That is, they must focus on searching new opportunities to create new products and services using new technologies or production methods that lead to the enhancement of social as well as environmental conditions. Moreover, SMEs focus on the efficient utilization of energy and natural resources while harnessing the development potential of the new resources whose exploitation has been found to be cheaper, and resulting to less harmful impacts on society in general. The SMEs have been very successful at implementing sustainability measures due to their effectiveness in manipulating technologies, particularly where they can enhance outcomes, in decreasing the potential negative impact of entrepreneurial activities on the natural environment and the human condition in general. For instance, the SMEs have been successful at implementing various sustainability measures that have enabled them to absorb wastes and pollution cost-effectively, without causing permanent or irreversible harm to the natural environment.

The question of what sustainability factors impact the SMEs business success is completely depends on the nature of SMEs business venture. The following are some of the sustainability factors (not limited to) vital for young entrepreneurs and modern SMEs

a) Use of renewable energy sources
b) Use of pollution control techniques
c) Avoiding the use of Hazardous materials
d) Establishing a link between employees and the existing business community
e) Fine tune the business strategy towards adapting to climate changes
f) Periodically producing suitability reports

The rapid changing technological advancements intertwined with environmental effects also contribute progress of SMEs significantly. The very idea of "sustainability" stems from different perspectives like environmental and ecological sciences. Investigation of sustainability via MIS support for SMEs and entrepreneurs is precisely the focus of this research. Modern MIS functionality needs to support sustainability and help entrepreneurs, remain competitive.

4. Impact of MIS Research for SSMEs

Within the modern corporate world, MIS has become a key ingredient in the organizational transaction processing as well as business operations, since it provides vital reports to the various levels in the organizational hierarchy. Added to this MIS systems are specifically designated to give the right information when needed, enabling managers to exercise effective control of organizational resources and operations. For instance, the MIS provides the mid-level managers with organizational performance reports, which they use to predict future growth direction while the top management utilize the MIS for strategic decisions. There by in this highly competitive global business environment, an effective MIS enables SMEs to win competition since it provides the tools that can be used to evaluate and understand business dynamics both within and outside the SMEs yielding competitive advantage [11]. At the same time, the myriad challenges presented by the complex and fast-changing global business environment, such as effects of green house gases, establishing a strong relation between employees and community members, ways of reducing the pollution and industrial waste. Use of modern automation systems for generating green products and reduce environmental impacts, apart from integrating with strong business process. All these factors invariably exerts a huge pressure on entrepreneurs to respond effectively for sustainability in the face of the resulting socio and environmental circumstances.

On the other hand, an accurate, complete, and timely information is also a key resource in the present highly complex and competitive global business environment. This is precisely important to this modern society for facilitating effective management decisions in the pursuit of organizational development goals [3]. Enterprises need to have the appropriate information at the right time in order to respond effectively to the numerous market dynamics, in order to make profits and to survive the competition in the long term. The MIS research has been very significant to the growth and development of the SSMEs since it has enabled these enterprises to incorporate numerous sustainability factors in their organizational plans thereby making them more resilient and capable of survival in the face of the turbulent changes in the global business environment. Similarly, the incorporation of sustainability factors has enabled the enterprises to adapt to the myriad socio and environmental changes thereby prompting their growth and development effectively; besides that, the SMEs have emerged to be more innovative and productive through the effective utilization of raw materials and energy sources.

Past literature on MIS research clearly highlights three crucial factors of SMEs, viz., management, information, as well as systems; which contribute significantly to the
sustainability of SMEs; each of these factors have a significant impact on SSMEs in varying degrees [1]. The open question to many researchers, is to look for sustainability factors associated with these, and the ways in which MIS can address these. The current MIS research needs to contribute to the sustainability of SMEs by providing management with the basic framework for addressing the sustainability factors; management addresses sustainability factors from the environmental perspective, which takes into account the conservation of crucial environmental factors including air, water, climate as well as ecosystems. MIT research has also helped to fine tune management techniques in enhancing the needs of the SMEs in the present and in the future, thereby aligning the enterprises towards long-term economic performance. In other words, the MIT research highlights the intricate interconnectedness of economic and commercial imperatives with the environmental, as well as societal factors, which only emerges as the SMEs progress. The MIS function enables the SSMEs to track and monitor their functional targets, thereby providing the functional managers with real time information concerning the progress, achievements, and shortfalls in the various aspects of the business. This information is very significant in forecasting and long-term planning of the organization in response to the emerging situations; the value of this information is utilized in remedial actions to rectify the situation in case of shortfalls.

The MIS research has led to the systematization of business operations for the effectiveness of enterprise system designs; effective system designs are the basis for management and operational efficiency since it provides the manager with a variety of management tools that can be used to process data into useful information [4]. Systematization of management provides the SME manager with models and tools that enable him or her to manipulate data in ways that are not manually possible thereby making certain management tasks simpler while considerably enhancing the decision making function.

The MIT research highlights the link between information and sustainability, that is, it recommends the establishment of an information technology infrastructure that is efficient in terms of diminished impacts on the environment such as greenhouse gas emissions from the computing and IT related activities. For example, IT infrastructures that have central desktop power management software in addition to sleep mode functionality when not in use are more efficient in terms of energy utilization. In that respect, the MIS research is impacting SMEs by compelling them to respond to the current environmental as well as societal concerns by enforcing sustainability measures in their IT infrastructures, to promote protection and conservation of the environment while promoting societal needs respectively.

In this modern era, several automation systems for business organization are quickly start addressing sustainability issues, which is especially so for modern SMEs. These systems provide vital information that provides vision for the efficient future utilization of renewable energy sources yielding reduced energy costs. For instance, the environmental management systems require information in the monitoring, evaluation, enhancement, as well as communication of enterprise environmental performance, thereby promoting sustainability of the enterprises respectively. Therefore MIS research fine tuned to contribute significantly to the organizational knowledge concerning the natural environment thereby promoting the establishment of environmental strategies that take into account the protection of the environment and contributing to the enhancement of the natural environment.

Finally the MIS research has prompted SMEs to consider the environmental and social impact of business, to apply the business impacting sustainability factors to enhance their competitiveness, and to connect the sustainability strategy with their prevailing corporate business strategies. Overall, implementation of the MIS has greatly transformed the SMEs by helping them to save money since it promotes the efficient utilization of resources while
considerable reducing waste, apart from enabling SMEs to respond effectively to business risks in their environments. Moreover, SMEs maintain a positive social image and enjoy a wide social acceptance due to their sustainability approaches, which have only resulted due to the implementation of MIS as the decision making tool.

5. Useful Conclusions and Future Possibilities

The existing literature on business management approaches reveals a considerable body of research on the concept of managing people, time and resources through MIS. These MIS systems and their significance in the present global business environment is rapidly changing. This is precisely so, in view of the broadened information and technology (IT) platform coupled with sustainability issues such as environmental and societal changes. MIS research has been very significant to the growth and development of the SSMEs in the highly complex and fast-changing global business environment by enhancing their capacity to respond and contain the myriad environmental and societal changes.

Sustainability being a primary concern for many modern organizations in the present market conditions, MIS research needs to be fine tuned to dire need for strategic decision-making processes that yield competitive advantage for enterprises. It is concluded that the design and architecture of MIS for quick and accurate data processing, enable enterprises to incorporate numerous sustainability factors in their organizational plans. Further making SSMEs more resilient and capable of survival in the face of the turbulent changes in the global business environment, needs further investigation. Incorporating sustainability factors into automation systems like MIS can enabled the business enterprises to adapt to the myriad societal and environmental changes. This might ultimately results in prompting their growth and development effectively. The impact of MIS on MIS is expected to emerge more innovative and productive through the effective utilization of raw materials and renewable energy sources.

References
