

Role of Information Systems in KSA Small and Medium Enterprises (SMEs)

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Abstract: Information has become a basic resource in economic systems, especially in enterprises. In order to maintain enterprises to continue and survive, it is necessary to collect and store everything that helps them serve their activity, and from here, enterprises need to work on collecting, processing, storing and transmitting such information through information systems. In light of globalization, the world has become deeply sophisticated and fast-paced economically speaking. As a result of the depth of this development and the rapid changes in the field of information technology, the world has entered the era of information society. In this era, KSA Small and Medium Enterprises have become a common factor in the growth of the KSA economy, especially when implementing and applying information system methods in enterprises. This paper aims to discuss the growth of KSA SMEs in recent years and explore the role of information systems in their prosperity.

Keywords: SMEs, KSA, Information Systems, KSA economy, SMEs.

I. INTRODUCTION

The small and medium enterprises (SMEs) are affected by the changes in the business environment such as wide developments in information technology and communications systems. As traditional management and systems failed to make these small and medium-sized enterprises able to compete, grow and survive, the use of modern technologies and systems for contemporary management has become a necessity. Information Systems (IS) were introduced to assist in the growth and survival of SMEs with the aim of improving the processes within enterprises [15].

In this article, we briefly present the literature survey of the role of Information Systems in SMEs in KSA. After that overview of SMEs in the KSA, their impact on the KSA economy is discussed. Also, some light is shed on how the KSA government competently caters to the growth of SMEs. Then we investigated the role of IS in KSA SMEs, where KSA SMEs stand on the basis of IS adoption and the challenges faced by SMEs on implementing IS. Finally, we explore the strategies of IS in KSA SMEs and discuss that through real-life examples, highlighting the role of IS in achieving competitive advantages.

II. LITERATURE SURVEY

Most of the previous research papers on SMEs in the KSA discussed how an enterprise is considered either a small business or medium-sized enterprise.

The Council of Saudi Chambers [14] and Otsuki [3] say that the distinction between small and medium-size enterprises is based on the number of employees in the enterprise, while Hertog [2] distinguishes between them in his research paper according to the annual revenue. Previous studies also focused on the impact of small and

medium-sized enterprises in the KSA in relation to the economy booming in the KSA [2, 4].

Little research is done on the role of information systems in small and medium-sized enterprises (SMEs). Some research has been conducted in this field, but from other countries. SMEs in developing countries such as the KSA have different situations and circumstances that need further investigation. According to Bhagwat and Sharma (2006), there are numerous benefits for SMEs in utilizing IS such as enhancing their competitive advantages, reducing costs, bettering client administration, improving decision making [24]. In KSA SMEs, the use of IS to acquire knowledge was quite limited. SMEs' orientations towards knowledge using IT for collaboration and codification increased. The level of the use of the internet and emails was high. There are some factors which influence the use of IT in Saudi SMEs such as the absence of professional providers of IT solutions, which prevents SMEs from adopting information systems [25]. So in this paper, we discuss the role of Information Systems in the growth of SMEs in Saudi Arabia.

III. SMES IN KSA

In Saudi Arabia, SMEs represent about 93 percent of total enterprises and about 24.7 % of total employment. SMEs can be defined based on three criteria: the number of employees, annual sales and company origins. Most of public/private bodies dealing with small and medium-size enterprises are based on the number of employees as the first criterion [2].

The United Nations Industrial Development Organization (UNIDO) defined a small and medium-sized enterprise as one run by one owner who has full responsibility dimensions; strategic and tactical, and the

number of its employees ranges between 10 and 50. The Council of Saudi Chambers defined SMEs as ones where the number of employees is not more than 50 and annual sales are not more than five million riyals [14].

According to the *Saudi Arabian General Investment Authority* (SAGIA), the number of employees in small businesses is less than 60 and in medium-size ones, it is less than 100 [3]. On the other hand, Hertog defines small enterprises as having less than \$1.3 million of capital, and medium-sized enterprises as having less than \$5.4 million of capital [2]. SMEs are an important tool for achieving the goals of the Saudi economy, which contributes to the diversification of production and employment of citizens, which is very important for the future of the KSA and its youth.

A. Saudi SMEs and Economy

SMEs are important for some reasons such as their ability to employ a large work force. Thus SMEs reduce unemployment, which is a major concern in Saudi Arabia. Another reason is the simplicity of SMEs establishment and administrative structure [27]. The activities carried out by Saudi SMEs affect the Saudi economy as they employ 40% of the total number of employees in Saudi Arabia. Therefore, they contribute to about 28% of the national economic activity of the Kingdom [2]. The increased use of the Internet and computers in Saudi Arabia, and the rapid globalization increase the intensity of competition in Saudi SMEs [1]. So, many Saudi SMEs tend to produce technologies to provide products and services in an innovative manner. All these factors influence SMEs in Saudi Arabia, urging them to adopt innovative strategies and technologies to organize and manage their businesses, to keep up with the tremendous advancements in information technologies and to achieve competitive advantages.

Information systems' effect on the globalization of economic activities is both an opportunity and a threat to the growth of SMEs [4]. So, according to [20], the role of SMEs in the KSA is pivotal for supporting many national priorities like:

- Creating a more dynamic private sector participation with a more flexible and diverse economy.
- Promoting the transition to a knowledge-based economy and enabling innovation, through homegrown champions that can compete with international players.
- Achieving a growth that is more inclusive and balanced through addressing the bottom of the income pyramid, which includes micro enterprises.

B. Governments' role in the growth of SMEs in KSA

The Saudi government provides support for small and medium-sized enterprises by adopting several measures, which represents the Kingdom's commitment to the WTO. There are massive success stories from SMEs where they have a considerable number of jobs at minimal costs. For example, in Saudi Arabia, the labor market of ICT is

filling many places in SMEs with Saudi people. The government has allocated some resources to extend programs to develop SMEs in the recent years. There are currently more than 50 public and non-profit entities that are engaged to promote the activities of SMEs covering many services and investors, which adds to investment opportunities.

According to SAGIA [20], these activities are: Co-Investment with public sector funds to finance SMEs, developing the expat Labor market, raising the skills of the Saudi workforce and providing support services for SMEs.

1) *Co-Investment with public sector funds to finance SMEs*: Previously, the government launched a lending mechanism through Kafala program. The government today is keen on launching SMEs that are engaged in investments with investors in the private sector. Also, there are plans to build investment opportunities for SMEs with entrepreneurs and investors (local/foreign).

2) *Developing the expat Labor market*: The government has provided legislations to develop and organize the expat labor market through large recruitment firms. Take, for example, the Ajeer program that aims to increase the recruitment services and also to govern the relationship between the customer and the expat recruitment firms.

3) *Raising the skills of Saudi workforce*: The Human Resources Development Fund (HRDF) has a large combination of programs to develop the KSA workforce capabilities. For example, Hafiz support programs of employment for SMEs. Also, there is a number of other entities that invested in developing the education sector aiming at promoting talents such as TVTC, Doroob and Colleges of Excellence. Moreover, in the education sector, universities establish new programs, especially in the fields of innovation, finance and entrepreneurship, and they foster such programs in the KSA e.g. Princess Nourah University.

4) *Providing support services for SMEs* : The government is investing in the development of capabilities that enable SMEs to have advantages and get integrated to facilitate operations, especially in procurement and HR systems.

5) *Encouraging SMEs in the KSA involves female entrepreneurs* : like Prince Sultan Abdulaziz Fund [27].

6) *Support of Saudi SMEs from American sources*: "U.S. Saudi Women's Forum on Social Entrepreneurship" is a program offered by the U.S. State Department. This is a massive effort among the US State Department and the College of Wellesley that work together with a group of students from the College of Dar Al Hekma in Jeddah, KSA; all of them are concerned with the opportunities in the KSA business [27].

IV. SMES AND INFORMATION SYSTEMS

Information systems (IS) are interconnected and organized components of people, computer hardware, software, communications networks, and data resources that operate together to collect, process and deliver

information and knowledge. Commercial companies and other organizations rely on IS to manage their processes, interact with their customers and suppliers, and process and manage financial accounts and their human resources. From the components of an IS, we can see that one of the roles of IS is to take data and convert them into information, then into organization knowledge. Today, most SMEs cannot grow and survive without using IS. IS provide a base of information that helps these enterprises solve the problems they face. This also helps them manage the planning process for sales and control, and this leads to the improvement of companies' products and advancement.

Some small and medium-sized enterprises do not use information systems at the beginning of their businesses for several reasons such as ignoring the importance of information systems, using such systems may consume a lot of time and is highly costly. When they use information systems, they upgrade and improve their performance. Also, the quality of information and the productivity of individuals and organizations are improved through the use of IS. Information systems improve the efficiency and effectiveness of SMEs; there is a remarkable relationship between the increase of management efficiency in terms of goal achievement and the use of such systems that led to an increase in managers' saved time. Raising the level of productivity through the completion of tasks over time, e.g. business' transformation to mechanization, greatly helps in achieving economic savings. Also, reducing labor costs can be attained by shifting to information systems [13].

A. *The role of IS in health institutions in KSA*

The rapid development in the field of information systems which spread in all areas, including hospitals and clinics, led to the development of information technology that is used as a means to develop, facilitate and achieve gains through the use of such information systems in organizations. Many doctors in KSA have facilitated their work by converting from paper health reports to electronic ones. An enormous amount of health information has created issues when utilizing traditional paper-based systems. For instance, paper-based medicinal records are lost, which results in significant problems. For example, the requirement for rehashed analytic tests postpones the arrangement of considerations, leads to legal problems and defers patients' discharge process. Consequently, medical centers began to utilize IS to enhance the quality of work.

IS are created for hospitals and clinics to help the medical staff access and process a large amount of information, which improves the work quality through coordination and sharing of stored information. An IS aims to manage all healthcare activities e.g. planning, monitoring, coordination and decision making, which ensures the improvement of records and their availability on demand by making the information accessible to decrease the waiting time prior to obtaining the desired information, lessen the duplication of medications administration and back the making of better choices identified with patient care considerations.

A lot of technology companies specialized in clinical systems offer fundamental solutions in order to maintain full patient information along with electronic and medical bills, and the clinical data based on medical records. The upgraded version of clinics management system is a hospital information system; the relevant corporate information systems of hospitals currently focus on small and medium-sized enterprises. The development of these software companies have made things much easier for all users and ensured great benefits for doctors and nursing departments, receptionists, administration departments and patients. Such information systems make life easier and less prone to human errors resulting from unnecessary daily activities.

Balsam is a company in the KSA that builds information systems for SMEs in the medical sector. Balsam offers a complete package of healthcare management through solutions for the management of the main "OASIS" health information system, which provides a wide range of clinical, financial, administrative and specialized facilities.

OASIS management information systems in hospitals have many features. The lab system, for example, requires a lot of initial groups consisting of different tables such as test codes, the range of reference, quality control standards, formats of the existing work, and so on. This process is time-consuming, and requires a lot of thought and effort on the part of the supervising staff. If it is possible to transfer this collection of raw data to another location with the application of such systems, this will spare the specialized staff a lot of effort during the preparation of the laboratory application in hospitals. In turn, this will provide a high degree of uniformity and consistency in hospital operations.

IS enhance inter-hospital communication at the application level so that hospital staff can easily access the information required; they also provide an online access to patients' medical history anywhere within the network, not only to improve the quality of treatment, but also to reduce the cost of patient care by reducing repeated treatment. All this can be achieved if there is an effective communication at the application level through computer systems. The OASIS application provides such connectivity levels, which eliminates delays and inaccuracies that are usually associated with telephone or paper-based communications.

B. *Saudi SMEs level on the basis of Information System adoption*

There are three levels that show how Saudi SMEs adopt IS in their enterprises:

1) *Level 1:* Saudi SMEs in this level of IS adoption have only the basic IT infrastructure like computer, LAN, etc. So, these firms use IT only for data processing and basic communication. Take for example, AL-Hassaniya Company.

2) *Level 2:* Saudi SMEs have an application to automate functions, but these applications have not been activated yet. Take, for example, Seif Company.

3) *Level 3:* Saudi SMEs have automated core business functions and processes by using Enterprise Resource Planning (ERP) systems that achieve complete process automation and integration. Take, for example, Hospital Management System (HMS) in health institutions.

C. Challenges faced by SMEs upon the implementation of IS

Although SMEs seem to be rising, they must be aware of the available technologies that can be utilized for the proper business uses. Some of the challenges faced by SMEs upon the implementation of IT/IS are the limited awareness, lack of IT support, lack of IT literacy, varying skills of IT awareness and management, inexperience in using consultants, lack of suitable Infrastructure and limited resources [6].

1) *Limited Awareness:* Many SMEs do not have knowledge of the available technologies to be applied in the institutions to increase productivity and help in the decision-making process.

2) *Lack of IT Support:* It is difficult for SMEs to attract employees in IT departments, or even retain them, for large organizations need them greatly and offer them higher salaries compared to SMEs. So, IT personnel are hard to afford for SMEs.

3) *Lack of IT Literacy:* Employees in SMEs work for several years on a specific and consistent pattern. These employees are not IT intellectuals and they oppose changing the work patterns that have been applied for several years.

4) *Varying Skills of IT Awareness and Management:* The success of most organizations depends on managers' skills and how they make decisions. If managers are not trained in terms of management and leadership skills, incongruities will be found, as far as thinking and skills are concerned, which may cause collisions during the implementation of their plans.

5) *Inexperience in Using Consultants:* Most SMEs have little experience in identify good consultants. To implement projects of SMEs successfully, they should have good consultants to save time, effort and cost. In cases where failures occur in projects, they will be very costly for SMEs.

6) *Lack of suitable infrastructure and limited resources:* The unstable and weak economic status leads to the delay of IS/IT implementation in SMEs.

V. THE STRATEGY OF IN IS SMEs

SMEs are inadequately served by the existing information systems strategy (ISS) methods of development. The ISS needs to consider the markets normally possessed by organizations. Numerous firms of the sort have assets that are hard to imitate. Rivalry is regularly thick; SMEs are not able to control products' cost or amount in the competitive markets. The contingent and standard perspective of competitiveness, in terms of cost or differential, is a big problem facing SMEs. It is

unrealistic for them to have the ability to secure customers and suppliers.

The resource-based view (RBV) strategy may be more fitting as a basis for ISS improvement in SMEs. By using a resource-based view, the core capabilities are deconstructed into three components: externalities, process and competence. However, SMEs always do processes and have products or services that are hard to simulate. So, this resource-based view (RBV) strategy became helpful for SMEs to attain the competitive advantage.

The resource-based view disputes that competitive advantages occur when the gathering resources of firms are infrequent; the valuable non-substitutable and hard-to-emulate expression of the resource-based view strategy is through the confession and utilization of the firm's essential competences. These competences make the base for a business strategy. SMEs preserve competitiveness through an integration of these capabilities. So, information systems are used to manage knowledge; information system strategies are important for developing an IS programmer to manage that knowledge. Information systems are considered a strategic resource for the organization of small and medium enterprises, especially where the importance lies in its ability to bring a lot of advantages such as flexibility, speed, monitoring output and providing services that fit clients' needs.

Information systems support and help in decision-making strategies and, thus, improve the decision-making process. Information systems can also provide a strategic role through using modern information technology to assist in the creation and growth of creative and unique products that are hard to imitate. Activating the strategic role of information systems is important for providing organizational and technical requirements for information systems of strategic information planning as an important resource to provide hardware and sophisticated systems ready for such strategic planning, like decision support systems.

A. IS strategies in Saudi SMEs

We managed to communicate with some of the staff members of the Chamber of Commerce in Abha, KSA. They gave us some information about some of Abha's small and medium-sized enterprises.

For example, AL-Hassaniya Company and Seif Company are both specialized in the sale of spare parts of cars, but they adopt different methods. In other words, AL-Hassaniya Company uses information systems to implement its work plan, whereas Seif Company does not use such systems. Seif Company has no major Information System and its enterprise resources are managed through an old system using manual file entries. This company faces many difficulties when sending some information and resources outside the company and its staff are under continuous work pressure.

This company does not apply or use IS because this may be highly costly and take much time. Nevertheless, that

company has achieved high profits without using IS. On the other hand, AL-Hassaniya Company uses Enterprise Resource Planning. This system is useful for the company and is also flexible; it requires an extra effort, but the benefits obtained by this system outweigh the cost.

When the methods adopted by these two companies are compared, we see some difference, e.g. the skill of employees in AL-Hassaniya Company are high, compared with Seif Company. The quality of information at AL-Hassaniya Company is high. Also, the productivity of individuals and the organization at large has improved. These factors lead AL-Hassaniya Company to expand, increase their profits and thus, it became one of the big companies in Saudi Arabia.

VI. THE COMPETITIVE ADVANTAGES OF IS IMPLEMENTATION

The definition of competitive advantage according to [9] is “An advantage that a firm has over its competitors, allowing it to generate greater sales or margins and/or retains more customers than its competition”. The SMEs are considered small rather than large, but the size of small and medium enterprises does not represent an obstacle; they have positive aspects with which they can achieve excellence such as proximity to market, flexibility, reaction speed and the speed of adjustment. These features are important for increasing the competitive advantage in the small and medium-sized enterprises when any change occurs in the contemporary environment. The flexibility of SMEs has three kinds: a flexible process that allows freedom, and speed and re-employment of resources, a flexible organizational change regulation that is quick and has a low cost and a flexible strategy in the selection and adjustment of goals. These features help SMEs to respond to rapid changes faster than large enterprises.

The competitive advantage is no longer optional; it rather became inevitable for SMEs that seek to survive and grow. Here comes the need to establish information systems to meet the globalized challenges and changes rapidly, orderly and without any mistakes. So, the existences of information systems in SMEs helps create competitive advantages globally and locally. Information systems affect competition of SMEs in three ways [10]:

- IS change the structure of enterprises, and during that, they change competition rules.
- IS produce competitive advantages via presenting SMEs with new methods to distinguish their competitors.
- IS spawn new processes from existing operations.

IS help SMEs raise the competitive position as relying on information systems can easily compete players in the labor market. Information systems help organizations that adopt the competitive vigilance method; competitive vigilance is strict and careful follow-up of the movements of competitors by collecting information about them. Information systems are considered a competitive advantage of SMEs because enterprises today do not pay heed to the concept of competitive advantage without possessing integrated management information systems [11].

The implementation of information systems in organizations leads to cost reduction which eventually leads SMEs to achieve competitive advantages. Moreover, enterprises' vision focuses on how to retain competitiveness via adopting information systems in SMEs [5]. On implementing IS, an SME must have a ‘value-creating strategy’ that is not used by others. SMEs can have the competitive advantage depending on two things: a) the structure of the enterprise, and the role of information systems in decreasing the cost and in managing huge information properly. b) the resource-based view strategy. So, the competitive advantages increase due to the ability of enterprises to amass capabilities and resources that are non-substitutable, valuable, difficult to simulate, and rare.

Some field studies that have been conducted have shown that there is a strong relationship between SMEs and competitive advantage with IS, such as in: *Information Technology Interventions for Growth and Competitiveness in Micro-Enterprises*.

The authors explore how small enterprises can adopt information and communication technology to grow and achieve competitiveness. The researchers conducted a field study of a set of seven small enterprises in which they used action research for treating small enterprises through an IT therapy process. This process includes allocating IT solutions for opportunities and problems, and developing a longer-term project plan of IT for each business. The increase in the competitiveness of these small enterprises was evaluated by using the focus dominance model [12].

The fact is that till now, there are no field studies on Saudi SMEs to demonstrate the effectiveness of information systems in achieving the competitive advantage. But by reasoning, based on the research conducted on SMEs outside the KSA, there is an affirmative link between the presence of information systems and the competitive advantage of SMEs. The information systems play an important role in SMEs to achieve competitive advantages.

VII. CONCLUSION

Most of the previous studies focus on the impact of KSA small and medium enterprises on the booming KSA economy. The research done by Ahmad [26] explores the strategies of SMEs in the KSA. Most studies do not discuss the role of adopting information systems in SMEs. Saudi SMEs are keen to implement IS to grow in the market, but they lack the infrastructure and technical skills which can aid them to fulfill their objective in the future.

In our research, we discussed these challenges and we found that information systems play a great role in the growth and survival of SMEs in Saudi Arabia. Implementing IS in many SMEs will increase their competitive advantages. The KSA government provides great support for small and medium enterprises; this is a chance for investors to establish SMEs adopting IS.

Finally, increasing the number of SMEs that apply information systems will facilitate their work and enable them to compete globally.

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