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THE EVOLVING OF ORGANISATIONAL STRUCTURE AND HOW INFORMATION TECHNOLOGY INFLUENCE ORGANISATION

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Visions for the Future

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TABLE OF CONTENTS

INTRODUCTION	2
BODY.....	3
1. Information technology	3
2. Organisational structure	3
2.1. Overview of organisational structure	3
2.2. Traditional organisational structure	5
2.3. Contemporary organisational structure	7
3. Interaction of information technology and why do organisational structure change	9
4. Influence of information technology on organisational structure	10
4.1. Span of control	10
4.2. Employees empowerment and change in the workforce	11
4.3. New type of workplace and communication	12
5. Prediction of future organisational structure.....	13
5.1. Network/Virtual organisation	13
5.2. Challenges of network/ virtual organisation	13
CONCLUSION.....	15
REFERENCES	16

INTRODUCTION

The revolution of technology, especially the internet has become one of the best invention recently. Information technology is a part of the technological advance. Many discussion has been made stating the interaction between information technology and organisational structure. Organisational structures change over time due to several reasons, including the influence of information technology.

According to the study related to the technology and structure conducted by Woodward (1980), she emphasized the importance of combining technology and right structure that lead to the organisational success. Therefore, in association with the development of technology and the change in structure of organisation, this paper is designed in the field of topic “The evolving of organisational structure and how information technology influence organisation”. In particular, this paper provides the concept of information technology and the different types of organisational structure in both old and new designs will be examined to provide the understanding of characteristics of each structure type. Then, the relation and influences of information technology and organisational structure is discussed, focusing on the span of control, cost reduction, empowerment, communication within an organisation. Lastly, the future structure of organisation will be presented along with some challenges for organisations when participating in the future type of structure.

BODY

1. Information technology

Recently, the world is growing speedily and it is proved that evolving information technology is one of the main driver of this fast growth. The definition of information technology (IT) was conceptualized by various researchers. Some simple examples of IT are fax, voicemail, electronic mail.

IT is a device that control, analyse or exploit information then processing information through a digital computer to the user's communication (Huber, 1990). IT also can be understood as a method of exchanging information through the internet. This is supported by Achimugu et al. (2009) who defined that IT is a fast and convenience way of communication. Another definition of information technology was developed by Kroenke (2012). The researcher stated that an organisation used information technology as a product, method and intervention to create information. According to Laudon and Laudon (2012), information technology comprises of both hardware and software that are adopted by organisations for the purpose of goals achievement.

It is said that currently organisations invest around 3,598 billion of US dollars on IT globally (Charles, 2017). IT resources within an organisation are divided into two main parts, including Information technology (IT) infrastructure and Human information technology (IT) resources. IT infrastructure contains hardware, software, databases and Human IT resources of an organisation is related to the expense for IT personnel (i.e training, wages) (Bharadwaj, 2000).

2. Organisational structure

2.1. Overview of organisational structure

Organizational structure has long been one of the most essential elements in the management field because it is attributed to the basic goal of any businesses and truly reflects

on the fact whether a company succeeds or fails in a particular marketplace. There are a number of different researchers define the term of organisational structure given the fact that this concept varies across the industries that each company has its own structure to operate and attain goals. According to Monavarian et al. (2007), organisational structure is a set of processes that allocating the tasks in order to direct and manage them.

Organisational structure relates to other aspects of organisation, such as size, strategy, technology and culture (Handy, 1993). This term has been expressed similarly by Miller (1989) and Mintzberg (1989). The organisation can base on the nature of the business, the value or the size to decide and choose appropriate structure for management purpose.

Four aspects of structures

There are four main elements that build up the structure of a company. They are centralisation, formalisation, hierarchical levels and departmentalisation. First, centralisation refers to the authority at a top level of management in organisation while in decentralisation, decision making are processed at a lower level (i.e employees). Most employees are attracted by the form of decentralisation as the process of decision making is faster and employees can participate in that process. Next, formalisation structure operates based on the rules and regulations so that the organisation can direct and control its employees through those rules. The advantage of formalisation is that it provides a clear guideline for employees, therefore offer behaviour consistency among workforce (Pierce and Delbecq, 1977). Another element of an organisation structure is the hierarchy level. In this element, tall structures are described as a structure with several layers whereas flat structures have less layers. The organisation with flat structure offer a higher level of staffs' satisfaction comparing with tall structure. Lastly, departmentalisation refers to the structure that categorises organisation based on either functional and divisional.

2.2. Traditional organisational structure

The concept of organisational structure has been examined from earliest period until now and there are different types of structure that an organisation can adopt. According to Oliveira and Takahashi (2012), in the very early stage, structures of an organisation can be depended on its product or its function. In this paper, two main following organisational structures will be presented.

Functional structure

This is one of the most common and simple form of organisational structure. In this structure, organisation would base on job functions to determine the structure. In other words, functional structure means the organisation places their employees into different department by their functional specialisation. Employees who perform same function will work in the same departments and contribute the job requirements of the organisation. Nahavandi and Malekzadeh (1999) emphasized that this type of structure is suitable for small and medium-sized businesses to control their operation in a constant environment.

When an organisation grows, the requirements of extra functional department will arise. Thus, a functional structure can fulfil that needs. This is one of the key advantages that introduced by this structure. As employees are grouped into common function, it enables employees develop their skill and gain in-depth knowledge in their specialization, but not other specialization of other departments. Further, the weakness of this structure, is related to individuals working in the same functions. Employees are encouraged to focus only on their tasks in their own department, leading to the less innovation as well as poor communication within organisations (Baron and Greenberg, 1990). Also, it results in the poor horizontal coordination among departments (Robert, 1979). In addition, organisation may face hierarchy overload. Top management would discover the difficulties and overload in integrating different functional activities, making the decision making process slowly.

Divisional structure

Employees are grouped by products/services based, sometimes depending on the market and geographical locations. Organisation which apply divisional structures typically require decentralised management to report to top management and decision making process is down to the divisional level.

This structure is believed to be appropriate for large businesses with multiple products or services, operating in uncertainty environment, which request the fast reaction to their customers and competition. There are a number of benefits that divisional structure organisations offer. Firstly, the organisation will be more flexible comparing with functional structure organisations. Each department has their own specialisation in a specific product/service lines, or market; making the organisation response to customers' needs quicker, resulting in customer satisfaction (Robert, 1979). Secondly, divisional structure organisations encourage employees compete with other divisions while still adding value to organisational performance. Further, according to Baron and Greenberg (1990), there is a high coordination across functions as each product can fulfil the needs of customers. On the other hand, it is said that there is poor coordination among product lines since each product line is in a separate division (Mintzberg, 1992, 2009). Baron and Greenberg (1990) supported this idea when stating that in some cases, actions of an operating division may cause effect on other divisions' outcomes. Further, one of the common downside, is losing economies of scales (Robert, 1979). Unlike functional structures that placing employees to work and share same facilities in the same functional department, in divisional structures, employees are assigned to different product divisions. This eliminates the in-depth competence and makes the organisation duplicates its facilities for each product division.

Limitations of traditional organisational structures

In general, there are some certain weaknesses exist among traditional structures and these limitations might be the reason why organisations shift to other structures.

- Inflexibility: the inflexibility of organisation is mainly due to hierarchical structures. The hierarchical organisations best fit with standardised practices, but it prevents organisations from transforming and changing in a rapidly growing environment. Also, hierarchical structures result in slow response to new opportunities.
- Time-consuming in decision making process: it is mentioned above that hierarchical organisations allow top-down decision making. The authority is strongly concentrate on top management. Thus, the decision making process is often slow.

2.3. Contemporary organisational structure

Traditional hierarchical structures would have impact on the productivity because of their characteristics, and organisations continuously demand for more specialised in rapid changing environment, so the number of organisations use more complex structures arise.

Matrix structure

In a study by Greiner and Schein (1981), they stated that matrix structure does not follow the typical hierarchical structures. An open and flexible structure is introduced rather than the old structure where specialised departments are offered and there is only one single boss that direct subordinates. Matrix structure is a structure focuses on both functional and project specialists at the same time. This structure requires employees to report to both product and functional managers, for the purpose of delivering high level of integration within the organisation, making firms more flexible in achieving goals for both company-wide and their product lines. Matrix structure has gained attention by different companies in various sectors in 20th century such as banking, oil and gas, electronics, aerospace and so on (Sy and Cote, 2004). The structure is believed to fit best for organisations in diverse market with

several products, especially high technology companies (George and Jones, 1999). Rather than just focusing on a specific function like functional structure companies, employees in matrix structure are allowed to work in additional groups for interchange their knowledge and advanced skills between project or product. Thus, it provides employees opportunities to improve their skills as well as get better career growth on their interest (Gordon, 1996). It also results in better communication among groups of an organisation. Besides, Bannerman (2010), from his point of view, argued that matrix structure indicates some disadvantages. Dual reporting relationship cause the risk of confusion among employees. The risk of conflict in management occur due to a large number of managers in matrix structure. Sometimes, personnel issues arise among employees since dual reporting make unclear and overlap in authority and responsibility, leading to the high level of stress and staff turnover (Nicholas and Steyn, 2012). It is also suggested that there is an equal power between functional managers and projects managers within matrix organisational structure in order to avoid employees' actions to impress managers who have bigger influence for their personal purposes (Greiner and Schein, 1981).

Boundaryless organisation

According to Ashkenas et al. (1995), boundaryless organisation is the flexible and unstructured type of a company in which there is no barriers within the company and also no external barriers between it and its customers and suppliers. Boundaryless organisation exists in different forms, including modular organisation and strategic alliances. In the form of modular, a firm will outsource all the unnecessary functions to external suppliers while only keep the essential functions internally. Strategic alliances form contributes to another characteristic of boundaryless design. Organisations create partnerships through collaborating with others for the benefits of both parties. An example of the partnership is Starbucks and PepsiCo in 2015 to introduce new Starbucks ready-to-drink products in

supermarket. While Starbucks has a strong brand name in coffee drinks field, PepsiCo has strong experience, marketing and distribution channel all over supermarkets. Hence, it is beneficial for both companies in building this partnership.

On the other hand, boundaryless organisation is claimed to be able to eliminate internal barriers among employees and departments (Rosenbloom, 2003). Thanks to the structure that allow teams to have self-management, employees are active and flexible in interchange their roles for the common organisational goals. There is no existence of “not my job” issue (Dess et al., 1995).

3. Interaction of information technology and why do organisational structure change

There are different demands that require organisation to change. Change in organisation can take many forms, involving structure, culture, strategy or policies changes. Depending on the scope of changes, creating plans for changing may take years and have affect on both employees and the whole organisation. The interaction between technology and change in structure of organisation will be focused and discussed.

The fast development of technology drive organisation to change. According to Crowston and Malone (1994), there is a relationship between organisational structure and IT. There are three aspects underlying in this relationship, namely, technological necessity, organisational necessity and interactive necessity. Firstly, technical necessity was studied by Woodward (1980) that structure of an organisation is shaped by the technology it practices. In other words, technology results in the changes of structure and formation. Secondly, in contrast with technological necessity, in organisational aspects, top management can consider changing some elements including technology change for a specific purpose of the organisation. Lastly, the interactive necessity refers to the relation of technologies and managers within organisations. This term is quite complex as it deals with what technology

allow along with what management of organisations want to achieve (Woodward, 1980). Similarly, Crowston and Malone (1994) expressed their view that supported Woodward's view by stating that current development technology and demands of an organisation lead to the need for organisational change.

In the study by Laudon and Laudon (2012), writers claimed that information technology (IT) is the key component that reflects the structure or shape of an organisation. They proposed an example of small firms with typically single and weak IT system while large companies usually design their own set of IT infrastructure.

4. Influence of information technology on organisational structure

Many researchers have proved the significant impact of IT on organisational structure, culture and management.

4.1. Span of control

According to Monge and Fulk (1999), communication and information technology can impact on the span of control within an organisation. Information technology takes communication across departments at workplace into a higher level. Using computer-based allow company to remove the middle management. In other words, firms increase the use of information technology lead to fewer layers of control; thus broaden the span of managers control and flatten the structure of organisation. Before information technology, organisation requires face to face communication among staffs and between staffs and managers. Nowadays, almost organisations use information technology to help employees connect with others at different places in different times, even outside working hours. Managers can actively check and deal with numerous problems arising through e-mail whenever they have time at any places. Thus, information technology eliminates the barriers in communication. As location is no longer a problem in an organisation with the utilize of information technology, employees are monitored by different software and methods such as e-mail, video. This makes

organisations widen their span of control, since employees and managers are not required to be in the same locations.

Next, information technology provide organisation a new environment for learning and teaching. Company can operate training courses for its employees to improve the performance ability through computers. Employees will be offered training through company's websites, simulation, online courses. Organisations can reduce the use of paper by placing training materials online, which offers employees a flexibility environment to learn at their own favour time. Moreover, employees can seek help from the internet or through communicating with other colleagues, instead of asking managers all the time. By training, it is possible for employees to have sufficient abilities and skills to perform their jobs, leading to the high authority and decentralised decision making process (Rominger, 1996). The way employees participate in making decision has removed the existence of middle management, thereby make the hierarchical level flatten. Also, due to information technology, the decision making process is becoming more quickly; thus, organisations nowadays are in need of recruiting managers who have knowledge of recent technology and how to use it in an efficiency way (Klein and Dologite, 2000).

The implementation of information technology can be a benefit for organisations in transformation of structure and widen span of control, companies still need to consider the potential downsize of this progress.

4.2. Employees empowerment and change in the workforce

There is a relationship between technology and workforce of the organisation. Using technology will result in the form of employees' empowerment. Drucker (1988) mentioned about this empowerment as "employees in the new information-based company will know what they have to do without a flock of vice-presidents feeding them information and orders". Under human IT resources, employees are received training on the technology,

helping them have appropriate skills and knowledge to understand their duties and meet the expectations of organisation. Thus, employees are given more authority in performing their jobs, leading to the high level of satisfaction within workplace.

On the other hand, due to the increasing number of new machines, the organisation may reduce the human workforce. High technological machines help improve the productivity, lower the production cost and save time. The reduction of number of employees also results in less payment for wages and other expenses.

4.3. New type of workplace and communication

As technology grows, there is an idea of new virtual workplace for employees. Since employees have the right to access to all information that needed for them to perform work, it is believed that employees can work independently. Jenner (1994) argued that the new type of workplace will allow employees to do their job anytime, anywhere and there is no need a physical office for them. This idea will automatically change the usual actions happen everyday at workplace. However, it is obvious that not all job fit with this new type. Further, there will be a change in the concept of communication due to information technology. It can be seen that communication is one of the key aspect within organisation. All activities including planning, organizing, implementing or monitoring need to be communicated among members of organisation. In this revolution, information systems will change the traditional way of communication. Computers allow employees to connect, share information as well as ideas faster than before. The new communication technology has decreased the need of face to face interaction and eliminated the slow communication (Alsene, 1994). In addition, it is easier for managers to monitor the performance of subordinates. Also, it is suggested that technology changes the communication between business and other businesses (Huseman and Miles, 1988). Companies will have ability to access to public information of other firms as well as share and transfer information.

5. Prediction of future organisational structure

5.1. Network/Virtual organisation

Definition of network/virtual organisation

The network/ virtual organisation is a quite new concept as it has been defined from the start of 1990s. It is defined by Chaudhari (2010) that a virtual organisation is a collection of different parties that share resources to reach certain goals of profitability and growth. Due to the rapidly developing of technology, virtual organisation does not require its members to be in the same region, they work through the electronic media and telecommunication. Therefore, this type of organisation avoids some difficulties, for example time and location.

Reasons for participating in network/ virtual organisation

Since the main characteristic of virtual organisation is removing time and location barriers thanks to technology, an organisation with virtual structure can operate among various locations and will benefit from the larger of skills of members. There are certain benefits that make organisations want to adopt virtual structure. In virtual organisation, it is argued that the total number of customers will increase (Chaudhari, 2010). Organisation can take the opportunity on reaching more customers indirectly. Moreover, the organisation can also offer a wider range of services for its customers. In addition, organisations can participate in more than one virtual organisations with the benefit of cost reduction. They do not have to invest in physical assets and physical locations to operate their businesses like traditional organisation.

5.2. Challenges of network/ virtual organisation

Apart from advantages that new type of organisation brings, virtual organisations can be emphasized as a complex type of organisations. The challenges of virtual structure are discussed as follow. Firstly, trust is one of the most challenging elements that organisations should consider when participating in virtual organisations. As virtual organisations comprise

interaction of different parties, it is necessary to establish and maintain the level of trust. However, it is difficult to build trust among members of virtual organisation. The differences in policies, legal and business requirements as each party operates in different countries often lead to the problems of trust. Also, some members have some fears of their information will be used and accessed by other members.

Another challenge of virtual organisations is security management. In this case, security means the protection that avoiding threat and risk. In order to prepare for a security management system, threats need to be determined. Threats can come in several forms, such as data loss or the use of data unlawfully. Sometimes, it is impossible to find out that secret information has been accessed as hackers can get information without altering the system (Jaroslaw, 2005). Also, threat of security can come from the trust among members of virtual organisations. Therefore, each virtual organisation member should have responsibility in protect their own security as well as the whole organisation resources security. According to Nami (2008), in terms of organisational, security managers are required to always monitor and supervise members' activities to identify threats among members and take suitable actions to eliminate those threats.

In addition, it is considered that a virtual organisation is not suitable for all projects and not everyone can act well in a virtual environment. Thus, it is a challenge for members of virtual organisations to gain ability to work individually and independently as there will be no direct control. It is also crucial for members to be able to communicate with others clearly as there will be no face-to-face communication in virtual organisations.

CONCLUSION

In conclusion, the concept and structures suggested by some old scholars are less effective in today environment. The old concept of traditional structures and methods show disadvantages over the advantages. Hence, it is importance for organisations to select appropriate structure to form their business in order to achieve perform effectiveness.

There are several opinions of researcher about the relationship of technology and transformation of organisation. Under this paper, it is proved that information technology has some significant impact that request a change in the structure and characteristics of an organisation.

In the near future, there is a hope that organisations will participate more on the new model of organisation, namely, network/virtual organisation, in which members work in a virtual workplace that differ from traditional structure recently. However, this new model of future is complex; thus, requiring organisations to fully prepare and invest in IT to deal with unexpected challenges. Moreover, the way of management would be changed in virtual organisation and managers should response to those change in order to adapt a new form of management. However, the dependence on technology sometimes cause issues as physical interaction disappear in this new form.

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