



Information and Communication Technology Development and Its' Impact on Business Strategy and Human Resource

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ABSTRACT

The advancement in information and communication technology (ICT) is increasing frequently within the business world. The rapid progress of ICT is reshaping the strategies of the business and management of human resource within the organizations. However, the ICT development considered as the most crucial part of modern world, thus this is the reason that organizations strive for the ongoing improvement in ICT so that it helps to empower the business strategies and strengthen the capabilities of human resource of organizations. Therefore, bearing the importance of ICT and its impact on business strategy and human resource, the aim of this paper was to explore the interrelationship between ICT development, business strategy and human resource aspects. The data collection technique used in this study was done through the secondary data resources (i.e. online databases such as Emerald, Francis and Taylor, SAGE journals, Science Direct, and Wiley Online Library). The results of the study indicated that the ICT has significant impact on the business strategy and human resource of the organizations.

Keywords: Business strategy, Capabilities, Development, Human resource, Information and communication technology (ICT), Impact.

1. Introduction

Many scholars have discussed the impact of technology on the society, business environment and human behaviour. Theoretical and empirical studies have revealed the necessity to adopt and exploit the outcomes of information and communication technology (ICT) in various organizations. Meanwhile, internet usage that causes the frequent improvement in ICTs also has been addressed by many researchers. Today, ICT has been penetrated into almost all activities of human beings. In consequence, ICT and its impact on the social, economic and personal development has become the area of interest for many scientific researchers during recent decades. At the same time, many studies have demonstrated the impact of ICT on human progress (Radovan, 2013) and behaviour of the employees in the organization (Hoogervorst *et al.*, 2002).

Today, ICT has spread into almost everywhere around the globe at astonishing pace, the Director of International Telecommunication Union (ITU) development bureau described 2014 ICT statistic that there are around 3 billion internet users around the world (two-third of them are coming from developing countries). Moreover, the increment in mobile-broadband subscription globally has reached 2.3 billion (Sanou, 2014). Thus, its rapid growth diffused among every sphere of life at unprecedented rate. For example; development of ICT in the area of education, health, tourism, business and human activities changed the way people live and communicate. Therefore, the impact of ICT on the business and human development or progress is considered as important issue for literature to address. Therefore, there is increasing evidence that ICT skills, innovation and technological change determine the firm performance,

productivity, growth and the capacity of countries to reap the benefits of globalization as it serves as a vehicle of innovation. Nevertheless, the use of ICT has been found to enhance the productivity of research and development (R&D) in innovative industries as well (Kossai and Piget, 2014).

1.1. Overview of ICT and its Impact on Business Strategy

Information and communication technology refers to the various technologies, which help people to communicate via sending and receiving information wherever they are (Naivinit, 2009), and in terms of the business strategies, many evidences can be found by the researchers that advancement of ICT is reshaping organization's internal business design or structure and sharpen the level of market dynamics and business strategies for many organizations. Arguably, these dynamics affect the require capabilities and behaviour of employees even more strongly (Hoogervorst *et al.*, 2002). Beside the development, it is believed that the involvement of ICT in business heightened the strategies by competitiveness, productivity growth, effectiveness, efficiency and expansion for organizations (Tarute and Gatautis, 2014).

Many scholars believed that the use of information and communication technologies (ICTs) enhance the business competitiveness with providing internet opportunities for even small and medium enterprises to compete with the large enterprises. Thus, the rapid development of ICT changes the existing business and ways of communication. The adoption and use of ICT shows fundamentals of competitiveness and economic growth for companies, organizations and even countries that are able to exploit them (Tarute and Gatautis, 2014).

1.2. Overview of ICT Impact on Human Resource of the Organizations

Literature underlined the impact of ICT on human behaviour and human progress (Radovan, 2013). Advances in ICT necessitate new types of employee capabilities and behaviour (Hoogervorst *et al.*, 2002). Noticeably, human resource also plays an influential role in the functioning of the organizations by coordinating the work environment. Similarly, ICT also plays major role in human development itself (Shade *et al.*, 2012). It has remarkable impact on the human empowerment and capability to be active members in their society and ultimately that will influence the employee attitude in the organizations.

Notwithstanding, the better human resource policies have positive impact on the performance of organization (Cooke, 2000). Changing human resource practices due to ICT are recognised as time and cost beneficent by the organization's managers. Furthermore, satisfaction of the workforce with their job and particular organization have also been identified (Zahra, 2012).

The relationship of ICT with business and human development has been subject of numerous publications, but the impact of ICT on human resource management and strategies of business are still seeking attention from the researchers. Thus, the aim the paper is to explore and analyze the literature on ICT, its recent development and its impact on business strategy and human resource.

The rest of the paper is organized as follows: section 2.0 presents the literature review (defining ICT and its development, the impact of ICT on human resource, and the impact of ICT on business strategy); section 3.0 discusses the methodology used in the study. While, section 4.0 presents the results of the study (interrelationship of three elements), and the last section gives the conclusion of the study.

2. Literature Review

2.1. Defining Information and Communication Technology

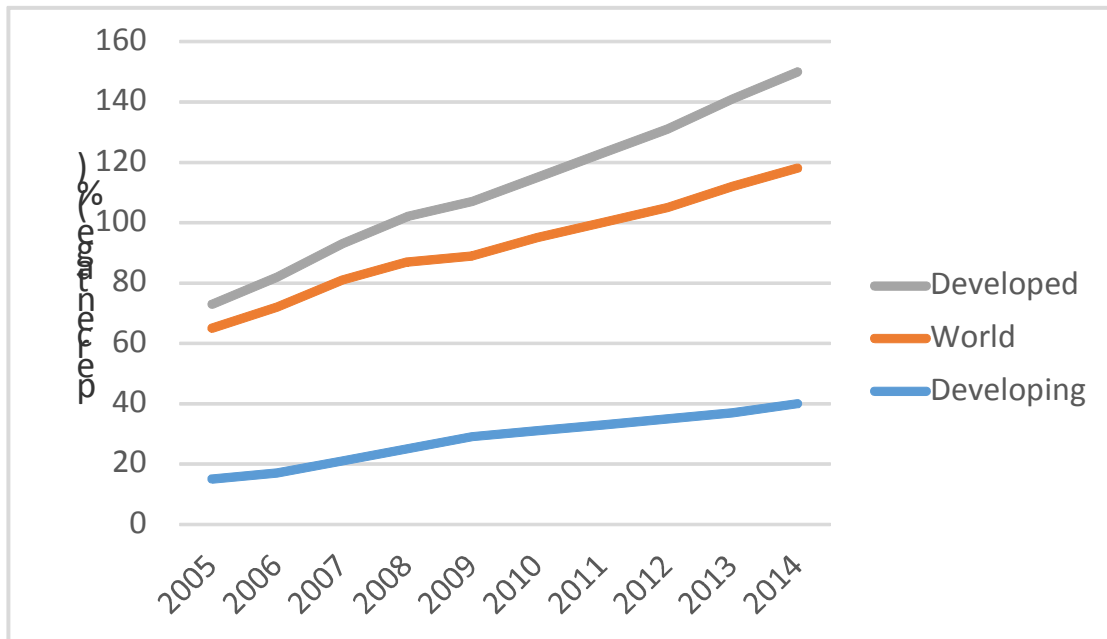
Information and communication Technology (ICT) is the term referring to the range of technologies, which help people to communicate via sending and receiving the information wherever they are (Naivinit, 2009). ICT has various digital applications such as computer; broadcasting; networks and contents (Sulaiman *et al.*, 2010). Pigg and Crank (2004) described the functionality of ICT into two parts; first Communication function and second, information function.

The communication function refers to the acts of transmission of different types with ideas and feelings from one individual to another. While, the information function is complex because internet based information transfer can take place using the variety of features of the network (Pigg and Crank, 2004). ICTs can be categorised as 'general purpose technologies' (GPTs) as well as 'enabling technologies' that are used in many sectors, leading to radical changes in the modes of their operations, providing new opportunities and intensifying production of R&D (Sulaiman *et al.*, 2010).

2.2. The Development of ICT

In terms of development of applications of ICT (for example, internet and mobile-broadband subscription), it has been identified by the ITU Telecommunication Development Bureau that there are almost 3 billion internet users worldwide, while mobile-broadband subscription have reaches over 2.3 billion all across the globe. The percentage of individuals that are using internet has been increasing every year at frequent level. During the period of nine years (i.e. from 2005 to 2014) the statistics rose by 40% globally (78% has increased by developed countries, 32% by developing countries). The data regarding the increment in percentage of internet users from 2005 to 2014 is shown in Figure 1.

Figure-1. Percentage of increment in internet users worldwide (2005-2014) (Source: ITU World Telecommunication / ICT indicators Database, 2014)



In terms of mobile- broadband penetration, it is demonstrated that it is also continues to grow annually. The development in mobile-broadband subscription per 100 inhabitants worldwide shown in Figure 2.

Figure-2. Increment in mobile- Broad banding subscription per 100 inhabitants worldwide (Source: ITU World Telecommunication/ ICT indicators Database, 2014)

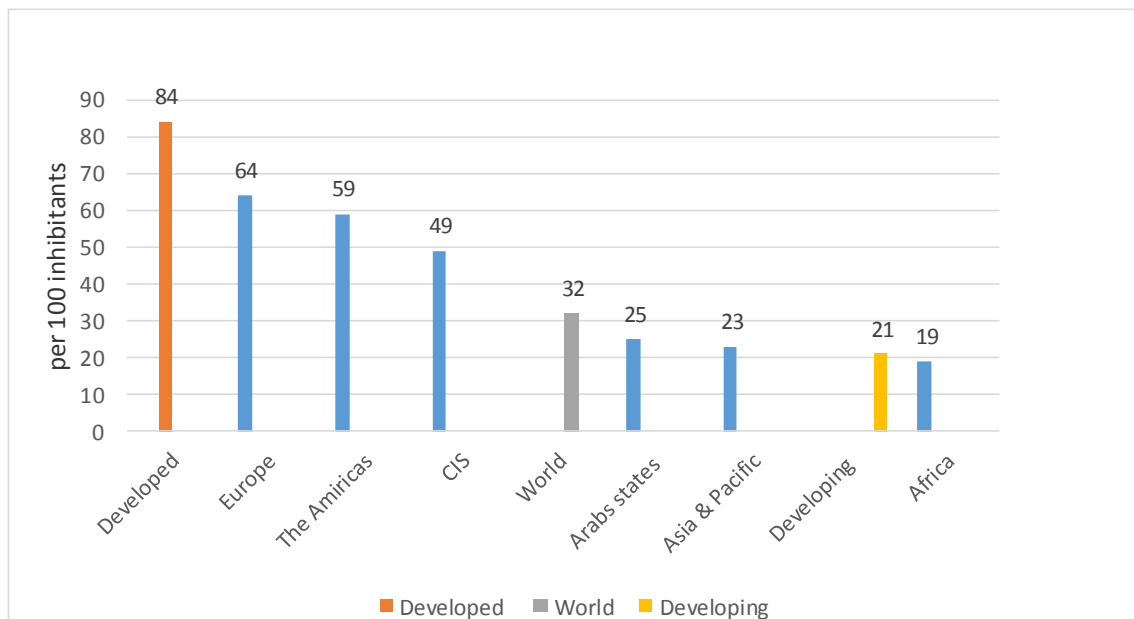


Figure 2 shows that the mobile-broadband penetration levels are higher in developed countries (e.g. Europe (64%) and the Americas (59%)), followed by commonwealth of independent states (CIS) (49%), then the Arab states (25%), Asia-Pacific (23%) and Africa (19%). It is obvious that the development in the ICT platforms is increasing over the period of time. While the developed countries occupy larger proportion in development followed by rest of the developing countries.

2.3. Impact of ICT on Business Strategy

Economic theories suggests that the diffusion of new technologies can have significant impact on economic growth and development. The ongoing diffusion of new ICTs is an example of dynamics of technological change and economic growth (Kossai and Piget, 2014). These changes affect almost all aspect of the economy, including the dynamics of innovation, productivity and growth, firm’s performance, the development of market structure and the demand for labor. Moreover, in order to lower the operating cost and increase productivity and quality, and response to the increased requirements of their customers and other business partners, the firms adopt advanced technologies. Thus, the main reason to adopt the advanced technologies (i.e. ICTs) to enhance the product quality, increase productivity and be cost competitive (Raymond and St-Pierre, 2005).

As mentioned earlier, there is increasing evidence that ICT skills, innovation and technological change determine the firm’s performanc, productivity, and growth and the capacity of countries to reap the benefits of globalization. ICT also serves as a vechicle of innovation. Nevertheless, the use of ICT has been found to enhance the efficiency of research and development (R&D) in innovative industries (Kossai and Piget, 2014). In terms of the the relationship between ICT and financial performance of the firms, Kossai and Piget (2014) found that in one dollar investment in information technology (IT) capital yields 5 to 20 US dollars (according to the hypotheses retained in the models) of additional market capitalization in state-owned enterprises. However, Tarute and Gatautis (2014) states that, in the countries and companies that adapt new technologies and innovations, expect the rapid changes. The companies can deliver better services and explore new business opportunities by satisfying at least three conditions; i.e. certain infrastucture, skilled ICT personal and budget to invest in ICT. All these three conditions are responsible for achieving the best results for the organizations.

ICT is the one of the key component to enhance the competitiveness of the organizations. ICT platforms (such as mobiles, PCs, and internet) have four major contributions to organization; (1) it causes more visibilty to business ornagizations; (2) it provides more information to small firms; (3) it allows enterprises to overcome traditional barriers; and (4) it facilitate financial transactions (Manochehri et al., 2012) while Tarute and Gatautis (2014) demonstrates that ICT also improves the flexibilty of the companies and organizations whereby companies that adapt ICT tend to perform better in the market and easier diffrenciate products and services. Consoli (2012) also agrees that for the best performance, it is crucial for the organizations to align ICT investments with internal capabilities and organizational processes. Manochehri et al. (2012) asserts that the use of email, e-commerce and social media network have significantly cut down on the physical transportation involved in seding mails, banking, advertsing and buying goods. (Consoli, 2012) classifies the benefits of ICT for organizations in four goup: performance, growth, expansion and new products. Figure 3 illustrates the impact of ICT on organizations.

Figure-3. Impact of ICT on Organizations (Consoli, 2012)

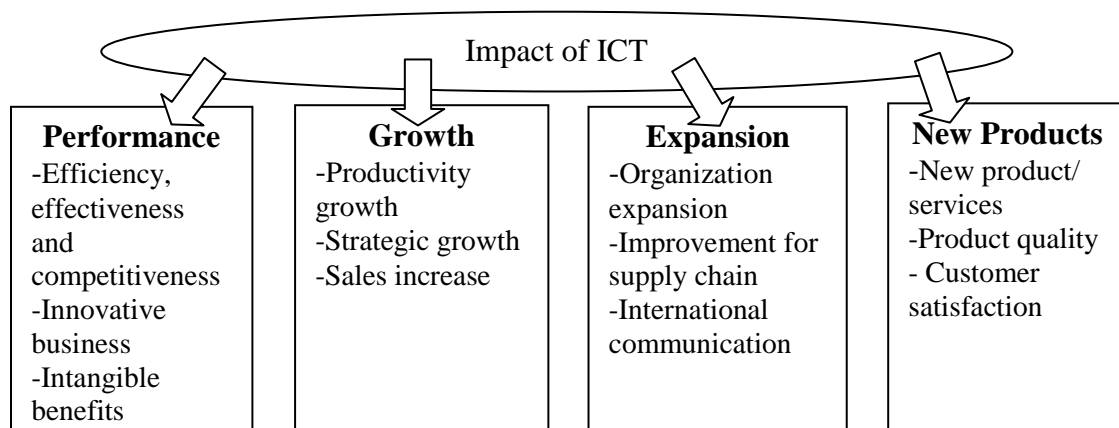


Figure 4 shows the four groups of main effects of ICT. Each of group consists of various dimensions, such as efficiency, productivity, and product quality. However, World Bank studies on the sample of 20,000 businesses in 50 developing countries reveal that sales grow faster, higher productivity and higher employees' growth in organizations that use ICT (Tarute and Gatautis, 2014). In addition to that, ICT also drives the fundamental changes in markets and competition, while intensified level of business dynamics is created, consequently fuelling the need for increased business agility (Hoogervorst *et al.*, 2002). Spanos *et al.* (2002) identifies that further capability through ICT is achieved through technologies in the service layer, where emphasis given to improvement of efficiency and effectiveness, but these technologies provide process support and improvement to guide the content and context of the business processes in which they are embedded (for example logistics, production, quality assurance, sales and distribution and customer service).

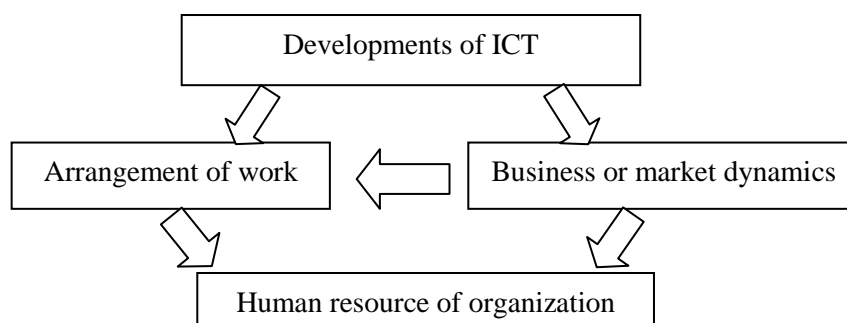
2.4. Impact of ICT on Human Resource of the Organizations

According to Csoka (1994) human resource fulfil multiple roles starting from administration to management development within the organization, and commonly believed that the human resource is most crucial and core asset for the development of any organization. In the hyper competitive environment, ICT can be used to enable data to turn into information. However, it is only through people that information is interpreted and turn into knowledge (Spanos *et al.*, 2002). On the other hand, ICTs enhanced the competitiveness of the human resource of the organizations and play an influential role in the functioning of the organizations by coordinating the work environment as it plays major role in human development itself (Shade *et al.*, 2012). Hoogervorst *et al.* (2002) noted that the ICT has remarkable impact on the human empowerment and capability to be active members in their society and ultimately that will influence the employees' attitude in the organizations. ICT causes the change in the labour conditions, relationships and regulations along with the work content of the organization, which demonstrates that the ICT affect organization in two ways; (i)it affects the employees' behaviour by the changing relationships with customers, suppliers, business partners, and (ii)affecting the arrangement and content of the job and work. Thus, organizations and the human resource strategies are almost changed and positively affected by ICT ranging from paperless office, time attendance, databanks, automating work practices, teleworking, transaction processing, reporting and tracking applications, e-recruiting using internet for staffing and employee development using internet (Zahra, 2012).

Nevertheless, (Glave-Gorritz and Castel, 2010) identifies the impact of ICT on human resource of the organizations on 1,169 firms and concluded that companies or organizations that invest in ICT employ vast numbers of educated and trained workers, have higher level of educated workers, present higher level of specific training , and have higher level of wages. In short, companies that invest in ICT, have more qualified and better paid workers and reinforcing the wage-inequality process (Glave-Gorritz and Castel, 2010).

(Huselid, 1995) determines eleven impacts of human resource practices in his study i.e. personal selection , performance appraisal, incentive compensation, job design, grievance handling procedures, information sharing, attitude assesment, labor management participation, recruitment efforts, employee training and promotion criteria. On the other hand, Hoogervorst *et al.* (2002) point out the two forces driven by ICT development on human resource of the organizations; (i) in terms of organizational prospective - the direct influence of ICT on the character and organization of work; and (ii) on the behaviour of the employee - behaviour and their practices. However, other force is the indirect effects on the employee behaviour resulting from the altering business and market contexts and dynamics due to ICT developments. Figure 4 demonstrates the two forces.

Figure-4. Two forces driven by ICT development on human resource organizations (Hoogervorst *et al.*, 2002)



The connection between the human resource, ICT and culture referred as the ‘collective mind of the organization’ which allows firms to address and resolve the unexpected issues of the organization as well. However, investment in ICT with employees participation enables the empowerment and cultural openness, and it appears that the human capital skills are highly required to make effective use of ICT (Spanos *et al.*, 2002). Fundamentally, in the information age, employees will increasingly become knowledge workers using brain skill instead of manual skills with tasks in developing, creating integrating and applying knowledge (Hoogervorst *et al.*, 2002). Human resource practices influence the employee skills through the acquisition and development of organization’s human capital, affect the productivity, and financial performances of the organizations (Huselid, 1995). Furthermore, Wright *et al.* (2003) explained that the human resource practices are strongly related to organizational commitment interrelationship of ICT development, business strategy and human resource of the organization.

3. Methodology

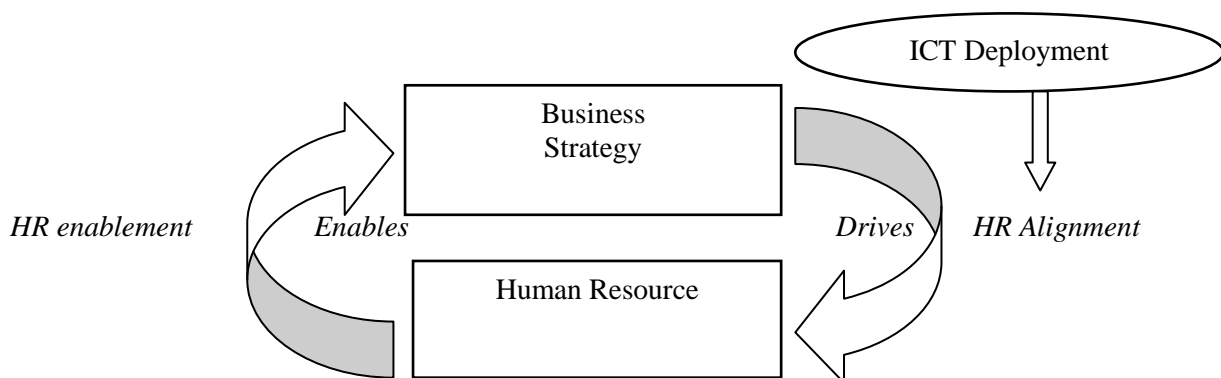
This study employs the literature analysis by using secondary data resources such as books, articles, and journals (for example, Emerald, Taylor and Francis online, SAGE journals, Science Direct, and Wiley online library). All of the resources are gathered and analyzed based on the theoretical perspective. Thus, literature review is the main approach in order to achieve the objectives of the study.

4. Interrelationship of ICT Development, Business Strategy and Human Resource

As, it has been mentioned earlier that there are ample researches which address the human resource as fundamental resource of any organization. However, at the same time, the fundamental issue that is continues to remain valid relative to human resource management (HRM) that whether HRM follows the organizational strategy or should be considered as a strategy in and of itself. Traditionally, human resource strategy is driven by or follows, the business strategy (which is called human resource (HR) alignment) although ICT deployment has impact on HR allignment aspect.

On the other side, strategy formulation is not linear or analytical process, rather strategy emerges through an iterative or synthetic process stimulated by various influences that originate from internal organization conditions as well as from external influences such as competitors behavior, market and consumer trends, and also trends in technology and society (Mintzberg, 1994; Hoogervorst *et al.*, 2002). This process view argues the emerging character of strategy facilitated by employee competences. These competences are established through an explicit human resource strategy, which shapes and modulates the development of business strategy. Hoogervorst *et al.* (2002) labelled this aspect ‘human resource (HR) enablement’ since the business strategy is adopted through the employees strategy offered by human resource strategy. Figure 5 shows the interrelationship of business strategy, human resource and ICT deployment.

Figure-5. Interrelationship of business strategy, human resource and ICT deployment



The framework developed by Morton (1991) stated that an organization is basically shaped by five forces (i.e. technology, strategy, organization structure, management system and people), which operate together in the context of a competitive environment. Then, these five forces collectively determine the dynamic equilibrium, and could lead the accomplishment of the firm’s objectives (Spanos *et al.*, 2002).

5. Discussion

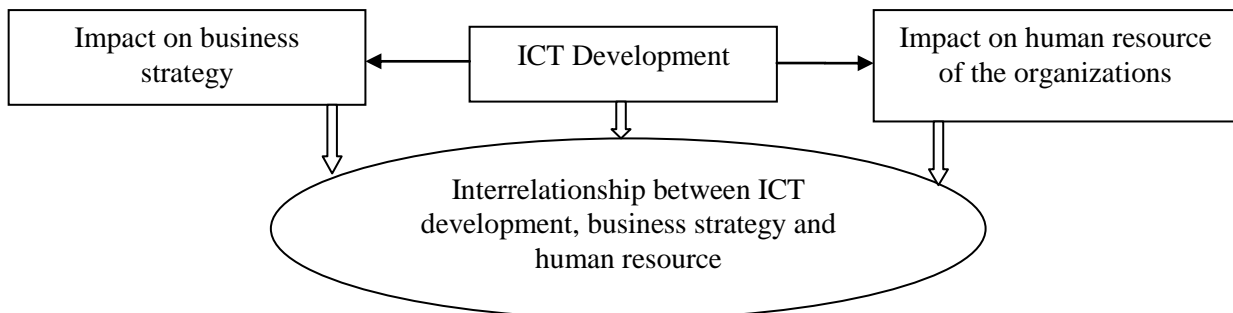
The study has explored the recent developments in ICTs around the world, the results from the development in ICT (such as internet and mobile-broadband subscription) is increasing at exceptional rate. The proportion of internet users has been increased every years. On the other hand, diffusion of new technologies has greatly impact on the business strategies of the organizations. Literature analysis demonstrates that development in ICT causes the economic growth, productivity as well as enhances the firm's performance. Many scholars believed that the use of ICT increases the competitiveness and flexibility of the organizations. The companies that adapt ICT have performed better in the market and easy differentiate their products and services.

Regarding the impact of ICT on firm's business or organization strategies of the organization, [Consoli \(2012\)](#) described four essential impacts, that is, ICT enhances the (i) performance (e.g. increase efficiency, effectiveness and competitiveness); (ii) growth (i.e. productivity, strategic and sales growth); (iii) expansion (organization expansion, improvement in supply chains and international communication), and (iv) in terms of new product, ICT enhances the new product lines and affect the customers satisfaction.

The researchers and scholars believed that human resource is also gives impact on firm's business strategy; namely, it empowers the human resource capabilities and alters the employee's attitude. ICT also has been found affect organization's human resource in two ways: (i) affecting employees' behaviour by the changing relationships with customers, suppliers, business partners; and (ii) affecting the arrangement and content of the job and work. Moreover, ICT changes the human resource practices from manual practices to more advanced ways. Thus, literature analysis revealed that the organizations that invest in ICT employ vast number of educated and trained workers as well as offer higher level of trainings and wages to their workforce. The development in ICT arranges the work content, increases business or market dynamics; and collectively affect human resource of the organization. Human resource practices are intensely related to organizational commitment.

The interrelationship between ICT development, business strategy and human resource could be explained as ICT development has significant impact on strategies of organizations, and literature proves that human resource drives from the business strategy as the HR alignment, thus, it is obvious that ICT development causes powerful business strategies and human resource driven from the business strategy. Figure 6 illustrates the interrelation of these three aspects.

Figure-6. Three aspects of relationship



In nutshell, the ICT development empowers the business strategy, however business strategy driven the human resource strategy for the organization.

6. Conclusion

The results of the study highlight the conceptualization of interrelationship of the three elements (i.e. ICT, business strategy and human resource). The conclusion of the study can be drawn as business that use ICT within the organization premises experiences more modified and assemble strategies like higher productivity, more growth, better expansion and quality. At the same time, it enhances the capabilities and empowerment of human resource of the organizations. This study is solely depends upon the existing literature analysis, while, in order to get more accurate and precise results for analyzing the impact of ICT development on business strategy and human resource, future researchers are highly recommended to draw the conclusion on the basis of quantitative research by sampling the variety of firms from different countries. It will lead to more precise and accurate results of the study.

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