Original Paper

A Theoretical Framework for Strengthening Women "Employment" Opportunities in Digital Technologies in Saudi Arabia

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Abstract

Digital technology is revolutionising employment, creating new job opportunities while disrupting traditional occupations. Few studies, however, have examined the impact of technology on women's employment in developing countries. There is a scarcity of literature on employment opportunities arising from the digitalization of economies for women in Arab countries, especially in Saudi Arabia. In this study, the major theories suggesting the applications and construction of technological knowledge and skills for improving the prospects of women's employment in digital technologies are presented. Numerous theories reviewed have emphasized the urgency of digital skills and competencies for enabling women to harness the job opportunities due to deployment of digital technologies, but they have not provided the mechanisms and ways to achieve the increased competencies and subsequently increased participation level in the labour markets in general, and in the labour market of Saudi Arabia in particular. Thus, the impact of digital technologies on the employment opportunities in digital technologies for women in Saudi Arabia need to be further assessed, since the unique political, social and economic characteristics of the state compound may contribute to employment opportunities and barriers against the successful participation of Saudi women in the labour market. This paper therefore highlights on the need for adoption of relevant approaches to address the research issue relating to the impact of digital technologies on the women's employment in Saudi Arabia. This study should therefore serves as guide for identifying areas of research needs in relation to factors that are necessary for increasing women's employment opportunities resulting from proliferation of digital technologies in Saudi Arabia and elsewhere.

Keywords

Women's employment, digital technologies, labor market, theoretical framework

1. Introduction

This topic is currently of great significance and interest because of the dramatic technology-driven changes that are taking place worldwide. This is particularly the case in Saudi Arabia, where technology is being promoted by the Saudi government as cornerstone of economic development. Van Besselaar (1997) explained that the digital age is transforming employment. Human resource managers are concerned to recruit the people with digital skills and knowledge rather than the ones with experience in manual handling processes, a symptom of automation and digitalization of workplaces (Sabbagh et al., 2012). These changes have resulted in the creation of job opportunities for both men and women, and several researchers view the digital age as providing opportunities to increase women's participation in the labour market (Nakafeero et al., 2013; Raja et al., 2013).

Moreover, Iglesias Fernández et al. (2010) argue that such a possibility will not be automatic but rather it will require a range of measures taken at a policy level by developed and developing states designed to bridge the "digital divide" between men and women. Hence, the participation and accessibility to the digital training and education is considered a key factor in empowering women via digital technologies, which may be affected by the cultural and social-economic norms of societies (Davaki et al., 2018). The women in developed economies may benefit more from the proliferation of digital technologies rather than ones in developing economies where they are supposed to assume the role of household wife (Yuen et al., 2014). The socio-religious norm is another prevailing factor which can affect the utilization of opportunities created by digital technologies for women.

Although the Western world offers women a range of entry-level jobs in the service sector, but in the case of Saudi Arabia, such opportunities are only at the developmental stage. The kingdom of Saudi Arabia (KSA) government's aim of economic development through the development of ICT-based economic and social infrastructure may offer a wide range of job opportunities for women with ICT skills (Abdulgahni et al., 2014). There are however some challenges in the realization of this goal of increasing the women's economic empowerment. The main challenge lies at the level of acceptance of society for allowing the work for women. The social institutions' support for women's work in the conservative societies such as Saudi Arabia can serve as a major barrier in the way of women's employment. Cornwall (2016) developed a model for women's economic empowerment in the developed countries, and described that the lack of support from the government, academic institutions and the employers could be a big barrier in increasing the women's equality at workplaces. Wirtschafter and Rafai (2018) argue that despite changes are favourable at the political level for women's participation in the labour market; women might still face barriers at the social level for grapping job opportunities created by the ICTs's growth in the KSA. For example, women might face stereotypic behaviour of families and employers in the male-dominated society of the KSA.

It is obvious that the landscapes of opportunities resulting from the digitalization of economies and societies on the enablers for and barriers preventing the employment opportunities available for women are orchestrated. It has been observed that women's numbers in employment have increased in technology-dependent organizations in developed countries, but there is a lack of research showing the trend of employment created by digital technologies in the developing world, especially in the case of Saudi Arabia (Women Tech Network, 2019). The barriers usually come from the social institutions within the society, which govern the norms of society, interact with women, and determine the size and scope of the career opportunities available for Saudi women in the digital technologies-supported labour market. This indicates that employment opportunities resulting from digitalization of Saudi society cannot be determined without placing the key actors or stakeholders in the limelight. This

review is designed to present the theoretical perspectives on the elements/stakeholders responsible or involved in process of handling employment for women in technologies in the labour market. The theories discussed in this review will help relevant stakeholders in playing a critical role for increasing the employment opportunities for women, especially in Saudi market. Therefore, the development of theoretical framework is essential to guide the methodological choices at sampling and data collection levels for further studies.

The first section gives overview and choice and justification of theoretical framework. The second section highlights role of different social structures in supporting the women's capability to harness the job opportunities produced by digitalization of society. The section also presents the literature in relation to digital education and training for Saudi women. The third section elaborates on the key concepts about the social structures supporting women's digital education and skills. The fourth section describes the current status of women's education and training in the Gulf region. The last section illustrates the research gap based on the literature reviewed and therefore the need for adoption of relevant approaches to address the research issue relating to the impact of digital technologies on the women's employment in Saudi Arabia.

2. Method

This paper is developed based on document analyses and reviews of relevant theories of particular importance to "employment" opportunities in digital technologies'. My debate on how to strengthen women's employment in digital technology is centered on the four most important theories: social diffusion of technology innovation, social construction of technology and theory of technology domestication and structuration theory. The paper do not just simply examined the merits of the theories on strengthening women employments in digital technology but also evaluates the limitations (criticisms) of these theories and how a strong and viable theoretical framework can be built. The institutional and policy support for building digital competencies, education system and digital competencies for women and Human Resource Management (HRM) were considered as some of the key areas if a successful theoretical framework is to be designed. The paper also emphasized on the research needs in women's employment in digital technology in KSA.

3. Building Theoretical Framework

In this section, major theories suggesting the applications and construction of technological knowledge and skills for improving the prospects of women's employment in digital technologies are presented. Theories are critically analysed in relation to their relevance, and finally justification for the choice of appropriate theory for this type of research work is presented in the subsequent subsections.

3.1 Social Diffusion of Technology Innovation

There are different theories of adoption and use of technology for changing the economic outcomes at individual and organizational levels. The social diffusion of technology innovation theory stresses on the diffusion of technological innovations to individuals and businesses which have adopted them differently in order to fulfill different individualistic needs (e.g., leisure, fun, employment) in the case of individuals and the operational needs in the case of business-oriented organizations (Hazen & Byrd, 2012).

Meade and Islam (2006) described that diffusion of technologies and innovation to businesses pinpoints the differences in the level of adoption of technologies at different stages of the business lifecycles, and that of the career progression in the case of individuals. They proposed that business lifecycles and progression of careers can be explained through adoption of technologies suiting to the business and

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individual needs through social diffusion of technology innovation theory. The adoption of digital technologies does not denote the improvements in the economic status of the individuals and organizations (Hazen & Byrd, 2012), as it requires the technical know-how, learning culture and social system for developing individuals to use the technologies based on the environmental needs (West & Bogers, 2014).

The basic assumption of social diffusion of technology innovation theory revolves around the adoption of technologies by businesses and individuals to fulfill their needs, and most of the studies conducted in media and technologies-related domain employed this theory to describe the adoption patterns rather than engagement patterns of individuals with technologies to gain digital skills for career progression (Meade & Islam, 2006). Bolick et al. (2007) applied social diffusion of technology innovation to assess the adoption of technologies by educators in the higher education sector. They argued that social diffusion of technology innovation theory is fit to describe the patterns of adoption of technologies at different stages of careers of individuals. Moreover, the social diffusion of technology innovation theory does not take into account functional roles of government, academic institutions and businesses in promoting diffusion of innovative technologies at social level (Kaminski, 2011), which limits its general application in the context where the research aim, for example, is to explore the employment opportunities for Saudi women resulting from the digital technologies from the selected organizational leaderships' perspectives.

The critics of technology diffusion theory highlighted the fact that it does not stress on the continuous learning and acquisition of new knowledge, shaping and reshaping of technological application to fit into business needs (Meade & Islam, 2006; Pande & Weide, 2012). Kaminski (2011) posited that social diffusion of technology innovation assume that innovative technologies are adopted by the users, but it does not necessarily inform that adopted technologies would be used by adopters to increase the economic prosperity, so its application in the context of economic benefits of adopters may be questioned. This is very important in this context as the focus emphasizes on increasing employment opportunities by training women in the use of digital technologies for improving their economic empowerment. This means that the good understanding of digital technological gadgets and applications, and gaining knowledge about their productive use may ensure the better employment prospects for women in the job market. Moreover, the social diffusion of technology ignores the deep-understanding of digital technologies in terms of their impact on the individuals' motives to achieve the career goals, rather than it addresses the motives of technological diffusion through different strata of society.

3.2 Social Construction of Technology and Theory of Technology Domestication

The social construction of technology (SCOT) theory described that technology can be shaped and reshaped based on the social contexts in order to serve the individual motives of businesses or individuals (Bijker et al., 1987). Therefore, Harwood (2011) argue that SCOT describes the relationship between the social development and technological innovations, suggesting the role of society and technology in shaping each other. For example, meanings of gender are defined by technology, and gender is involved in shaping the landscape of digital technologies (Harwood, 2011). For instance, the use of computer was advertised to be associated to men; however, this concept was changed when women also started to use computers. Hence, Dixon et al. (2014) argued that the gender gap observed in 1990s in the context of using the technological gadgets was significantly reduced in the late 2000s.

SCOT introduces the social group as an important player to decide about the potential design and development of technologies (Jackson et al., 2002). Social groups constitute the members of society who share the similar understandings about the meanings and utilities of particular form of technology. The

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SCOT assumes that all social groups taking part in meaning and interpretation of technologies under development are equal; and meanings given artifacts are purely attributed based on the social groups may be employers, employees, customers, designers and so on (Klein & Kleinman, 2002; Djordjevic et al., 2016; Fulk & Connie Yuan, 2017). The social groups have "shared assumptions, knowledge and expectations or underlying belief in relation to the technology", they continued that social groups "articulate different definitions, identifications, etc. of technology, their meanings in effect giving rise to different artifacts and systems" (Djordjevic et al., 2016). These propositions highlight that beliefs and perceptions of social groups about the utilities of digital technologies have implications for end-use and productivity of the systems (Pinch et al., 1989).

Theory of technology domestication is another theory which is used by researchers in context of technologies and its adoption by the users (Serensen, 2006; Berker, 2006). The domestication of technology theory describes that users have permanent role in moulding the technologies for their own benefits in their daily lives; and that technologies can be reframed or tamed to fit into interests of the users (Pantzar, 1997). The Theory of Domestication of Technology splits the use of technologies into four phases: 1) appropriation which deals with ownership of technological devices and applications, 2) objectification which is related to capturing the objective value of digital technologies within a social system, 3) incorporation which deals with finding ways to use the digital technologies productively within home or business environment, and conversion which is related to interpretation of digital technologies from the users' perspectives (Serensen, 2006).

In the first phase, owners set up the devices by downloading applications and settings them to fulfill their needs. This phase is mostly related to buying the right technological devices and application to serve the business needs of organizations or personal needs of individuals. The objectification, incorporation and conversion phases are experienced by users during their learning of digital technologies. Without capturing the objective value and real meanings and understandings about the digital technologies and their roles in increasing the economic empowerment, women cannot be motivated to be trained in digital technologies (Berker, 2006). In addition, specialized knowledge and training are required for women in order for gaining the understanding about the values and utilities associated to the digital technologies (Serensen, 2006). Also, incorporation of digital technologies is not possible without gaining the digital skills and specialized knowledge about the usage of digital technologies for economic gains (Smits, 2006). Berker (2006) contended that theory of domestication of technologies is mostly employed by researchers investigating the acceptance of technologies, the use of technologies or the rejection of technologies in a particular social setting.

3.3 Evaluating Suitability of SCOT and Theory of Technology Domestication

The critic of SCOT argues that it lacks any systematic approach for gaining knowledge about the ways and methods which can be helpful in increasing employment opportunities (Klein & Kleinman, 2002; Winner, 1993). Though social construction theory provides an insight into the construction of knowledge of digital technologies on behalf of users through having belief in benefits and utilities of technologies, but references to the usage of digital technologies for a variety of purposes such as employments and developing careers by working through technologies are not clearly provided. Moreover, interactions between different social groups are not described by SCOT, which can enable researchers for drawing inferences about the equipment of skills and knowledge to users for enhancing their career opportunities. Another drawback of constructive and demonetisation approaches is that they do not consider the political and organizational environments in which the learning and digital competencies can be gained, and which also affect the perceptions and set of beliefs/values of individuals about utility of technologies

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for career development (Rajahonka &Vilman, 2019). The interactions of users (women in our case) with social institutions and factors leading to uneven power distribution between women and institutions remain invisible in both approaches (Klein & Kleinman, 2002). However, impact of digital technologies on women in the context of present study cannot be explored fully unless the roles of social structures influencing the women's employment in digital era are explored (Orlikowski & Barley, 2001).

3.4 Structuration Theory

Structuration theory was presented by Giddens (1984), which articulated the relationship between the social members and structural environment. Giddens's argument was that individuals within a social system have agency, however, the social structures put restrains on their powers. The structuration theory basically opposed the ideology promoted by structuralism and functionalism which emphasised on the lack of individuals' powers in the face of social structures. Giddens argued that "one of my principal ambitions in the formulation of structuration theory is to put an end to each of these empire-building endeavors". He further posits "the basic domain of study of the social sciences, according to the theory of structuration, is neither the experience of the individual actor, nor the existence of any form of societal activity, but social practices ordered across space and time".

Structuration theory has wider applications in the field of digital and information systems promulgated by the organizations for facilitating the organizational performances (Kort & Gharbi, 2013). In reality, structuration theory is the most suitable approach, as argued by several researchers, for conceptualization of digital technologies in the dynamic way, and puts forward the concepts describing the true relationship between the users and digital technologies (Kort & Gharbi, 2013; Pozzebon & Pinsonneault, 2005; Boudreau & Robey, 2005). Many theorists (Boudreau & Robey, 2005; Kort & Gharbi, 2013) have supported the application of structuration theory as a suitable theoretical approach for understanding the connections between the users and opportunities conferred upon users through the skilful use and applications of digital technologies with focus on enhancing employability potential of users (women in Saudi Arabia). They have used the qualitative approach from the perspectives of the social structures/stakeholders to understand the position of agents (women) in the web of opportunities offered by technologies within particular economic and social settings. However, none of the researchers have tried to investigate the position of women in landscape of employment opportunities created by digital technologies in Middle East including Saudi Arabia.

As this theoretical framework emphasizes on the employment opportunities offered by the proliferation of digital technologies in Saudi Arabia for Saudi women, which is less likely to be realized unless and until the relationship between the human agents (women in this case) and the organizations responsible for increasing the digital competencies and thereby enhancing the employability potential of women in the Saudi society is viewed through lens of perspectives of major social structures as envisioned by structuration theory. These relationships between the agents and the digital technologies are captured effectively by the structuration theory, as argued by Boudreau and Robey (2005), as it explicitly surfaces any potential relationships between the agents and organizations in the presence of digital technologies. The authors seem to suggest that digital skills and competencies act as connecting between the agents and the organizations. The desire of economic empowerment serves as stimulus for women to act and gain digital knowledge and skills, while the need to utilize the digital technologies for functional efficiency lays the foundation for connectivity between the social structures/organizations and the agents (women in this context) (Boudreau & Robey, 2005).

Also, it is pertinent to acknowledge that structuration theory is not the only theory which offers the relationship between agent and structure. Some other theorists have put forward frameworks and theories expanding on the same issue. For example, Theory of Practice suggested by Bourdieu (1977), the constitutions of society theory proposed by Berger and Luckam (1966), morphogenetic theory suggested by Archer (1995), the critical theory of technology (1991-2002). However, these theories only presented with much focus on either agents or structures (social organizations), therefore, could not appeal to the researchers which are interested to map the characteristics of agents, organizations, and digital technologies in the dynamic way.

Therefore, it has been proven that each of the afore-mentioned theories has its own historical footing and singularities based on the issues falling in the contemporary social settings. The flexibility of the concepts (e.g., social structures, agents, interplay between the social structures and agents for streamlining, shaping and reshaping of social structures) as envisioned by structuration theory and their extrapolation to evolving nature of technologies are valuable in determining the scope of the career opportunities which is made available by social structures to the agents (e.g., Saudi women in my case) (Jones, 1999; Jones & Karsten, 2008). Jack (2017) argued that "Structuration theory is particularly suited to qualitative empirical research in management accounting.......it encourages and reminds researchers to use up to date scholarship from other disciplines in their research......... it refocuses research on agency and the intended and unintended effects that individual people have on structures.........it encourages research design that have the intention of building new theoretical insights" (Jack, 2017).

Agreeing to the views of Jack (2017), I found the structuration theory appealing due to three reasons: it promotes the in-depth insights into the views of individuals who are part of structures about the interactions resulting from a particular event (e.g., digital proliferation in Saudi labour market) between the structures and agents; it serves as theoretical framework supporting qualitative research design with the aim of offering theoretical insights into the research problem under investigation; and it puts emphasis on exploring the intended and unintended consequences of digital technologies on shaping the interactions between the structures (e.g., government, businesses and academic institutions in context of my research) and agents (e.g., Saudi women). Hence, this puts forward the argument for considering the structuration theory as a major theoretical framework for women employment in digital technologies in Saudi Arabia.

Compared to other theorists, Giddens's concepts relating to agents and structures are independent of the political situations in which theory, for instance, Giddens started his political commentaries and writings in 1995, while the discourse of the agents versus structures has started in 1970, which suggests that Giddens's theory of structuration is independent of the his political thoughts while conceptualizing the agent-structure relationships. This makes the structuration theory by Gidden a most suitable approach for identifying the relationship between the workers and the structures in the presence of digital technologies (Kort & Gharbi, 2013), which satisfies the lines of inquiries raised by this framework in relation to the women's career pursuance in digital technologies.

Like Giddens, Bourdieu (1977) also gave the dual interpretation of social systems, and advanced the habitus concept which was related to individuals' features and characteristics in relation to surrounding social structures rather than considering the focus on the social systems. The main argument promulgated by Bourdieu was that knowledge is constructed instead of being learnt passively. The critics of habitus concept argues that individuals cannot learn unless the social systems are supportive of the learning processes, which is addressed Giddens who argued that agents turn into active learners in the presence of the social systems' support. Moreover, Bourdieu did not consider or interpret the evolutions brought

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about by the technological developments, which are independent from the agents, within the social systems. However, Giddens's structuration theory is flexible and uses several concepts such as variations in attitudes and behaviors of social systems (organizations) and agents in response to external changes. This flexibility makes the structuration theory compared to Bourdieu's habitus concept a good fit to interpret the changes caused by technological proliferation in Saudi society in context of women's opportunities.

From the forgoing debates on Giddens's theory, it is clear that the relationship between "agency and structure" is prominently elaborated in the structuration theory. Giddens's definition of agency articulates that agency is not "the intentions people have in doing things but to their capability of doing things in the first place". Agency is related to the possibility that an individual can take actions based on the capabilities, which, in our case, reflects that women with greater level of digital competencies and skills have more probability to participate in the job employment created by the digital technological applications.

3.4.1 Giddens's Structuration Theory and Gender Issues

Giddens's structuration theory proposed the relationship between the social structures-institutions responsible for laying out policies, rules and practices leading to the employment opportunities for women within these very institutions—and power dynamic working at the centres of these institutions which may enable or disable the working opportunities for Saudi women in the labour market created by digitalization of the economy and society (Giddens, 2001).

In contrast to traditional feminist perspectives and theorizations, Giddens's structuration theory, where it supports the oppressive nature of the social systems/institutions, also espouses their "enabling character" which highlights the power of the social systems in formulating the relevant rules and practices to accommodate women within the social structures, thereby changing the social relations, restricting the opportunities for a particular gender (oppressive side), or expanding the opportunities in relation to building capabilities, seeking knowledge, progressing to the higher steps of the ladder or exploiting the employment options for women (enabling side) (Felski, 1989; Kahlert, 2012). Hence, Giddens's structuration theory presents the duality of structures, and according to Giddens, structures is "rules and practices" governing the very existence of social systems/structures which are also called institutions (Giddens, 2001). The rules and practices are aligned along with the perceived differences between women and men, which the former and latter interwoven in a social fabric. Hence, structures are gender sensitive, and actions resulting from the implementation of these structures (rules, practices) leads to favor either men or women or both simultaneously depending on socio-cultural settings (Wolffensperger, 1991).

Giddens's concept of "duality of structures" was understood by Kahlert (2012) and many other writers as a concept of "duality of gender" from the feminine perspective. They based their arguments on the production and reproduction of structures by integrating the gender as a structural category. The actions resulting from the structures (rules, practices) are socially intertwined with the social processes which accentuate the differentiation of gender at the social level, which is repeatedly produced and reproduced. Hence, the gender differentiation or gender identity is a part of social construction which lends to the gender position, differences within a social systems/structures/institution in their daily practices.

From this angle, structuration theory conceptualizes the social construction of gender in the daily practices of social systems/institutions which may stall or trigger the change in the conceptualization of gender within institutional boundaries, and how gender is understood as a result of social changes

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happening within and without institutional boundaries (Kahlert et al., 2012). This concept is pertinent to the research questions raised in this study. Since this theoretical framework deals with digitalization of Saudi economy which is triggering change in the social systems/institutions, and as a consequence of this change, what is the understanding of institutions about the employment opportunities resulting from this change?

There are divergent views in this context. One deals with women experiences with the use of technologies at workplace and secondly, the most important deals with institutional thinking about the women's place and position in response to the change relating to the digitalization of the society and economy. How far do the institutions trigger the change towards equipping women with skills and training in digital technologies for allowing women to work in digital technologies? Here the emphasis on employment opportunities, which means it has futuristic/prospective perspective rather than retrospective perspective, which is why no emphasis is placed on the women's experiences with digital technologies, which was still emerging phenomenon at institutional level in Saudi Arabia.

Giddens agrees to the ethno methodological approach to gender that doing gender consists of the production and reproduction of gender as a social routine. That means that people use practical knowledge of rules during the daily production and reproduction of gender in an experienced manner. In daily practices, gender is not challenged and it is unquestionably reproduced. Experience produced and reproduction forms a firm (gender) order.

He continues to argue that actors interpret gender in different ways based on their socio-cultural settings, which results in either undo the process of production and reproduction of gender, which indicates that institutions hold the authority to change the mainstream perceptions about the any gender-related event such as employment opportunities arising from the digital technologies for Saudi women. This is what called "transformative power of action to change the social practices of doing gender" (Kahlert et al., 2012), which was very key and guiding point which motivate to emphasis on the organizational/institutional/social systems related perspectives in exploring the employment opportunities in digital technologies for Saudi women.

Positing on the relationship of Giddens's structuration theory, Wolffensperger (1991) argued that structuration theory presents the "engendered structure" which represents the rules and resources governing the co-production of gender relationships and social structures/institutions., as the latter can be developed without taking the social differences between men and women which are linchpin of social practices. Both gender relations and social structures are inseparable in structuration theory, and their productions and reproductions as envisioned by Giddens's structuration theory.

Giddens envisages the structures as enabling, and therefore, the rules/resources developed by social structures are productive in terms of enabling changes which is very critical for research questions raised in this context, which demands data about the changes planned or implemented at the social structures/institutional level for bringing the change forward (Giddens, 2001). The application in this context is about increasing the employment opportunities in digital technologies for Saudi women in the consequence of the proliferation of digital technologies. The knowledge and capability of actors, the key concepts in Giddens's structuration theory, within institutional boundaries are driving forces in allowing Saudi women to exploit the employment opportunities or can serve as barrier in the way of participation of employment opportunities created by digital technologies (Kahlert, 2012).

Taken together, discussion in the foregoing paragraphs reflects the link of Giddens's structuration theory with feminine theoretical perspectives, and warrants its use in the studies reflecting over the gender relations. The studies exploring the gender issues either use Marxist-promoted feminine theories

which only look at the suppressive feminine outlooks practiced by the capitalist organizations and more focused on highlighting gender inequalities, or use the Giddens's structuration theory which offers the opportunity to researchers to explore both the enabling and suppressive characters of actors within social structures.

Kahlert (2012) also proposes the use of Giddens's structuration theory to explore more complex issues surrounding the females in the world of change and stability. The foregoing arguments and discussion justify the application of Giddens's structuration in my study with the aim to explore complex issue of women's employment opportunities from the institutional perspective rather than taking women as a general category. The women were situated at the heart of social structures which produce and reproduce the gender in their daily routines, and prospective data about the employment opportunities in digital technologies cannot tell the whole story unless.

After debating around the relationship between Giddens's structuration theory and gender issues, and role of social structures as enablers or disablers, this seems pertinent to discuss the social structures' importance in enabling the women's employment opportunities through supporting the women's digital competencies. The next section discusses the social structures in supporting the women's digital competencies.

3.4.2 Social Structures in Supporting Women's Digital Competencies

According to structuration theory as explained in preceding section, social structures including government institutions, academia and businesses constitute key mechanisms for regulating the interaction of agents (both insiders—organizational employees and outsiders—potential job applicants) with technologies and subsequently attainment of the digital competencies either to find jobs, self-employ or to progress up the ladder of digital career. In addition, expanding on the structuration theory, Gurung (2018) defined the social structures in the context of women's employment as the social institutions including the educational system, governmental bodies dealing with educational institutions, business organizations involved in training the employees and students in collaboration with academic institutions for economic empowerment through the skills development programs.

The education system, businesses, and government policies might act as enabler or disabler of raising awareness among women about the opportunities offered by digital technologies and providing them with necessary skills to compete with men for ICT-related jobs in tech-dependent SMEs. The debates on the role of education system, businesses, and government roles in equipping women with digital competencies are presented in the subsequent subsections. The discussion presented in this section would lead me to compare and contrast the findings from my study with the existing data in order to determine and predict the scope of job opportunities available for women in the context digitalization of Saudi society.

3.4.3 Criticism on Structuration Theory

Nevertheless, the fame and success earned by structuration theory proposed by Giddens's, it was criticized by several scholars as well. Rose (1998) and Layder (2006) criticized that structures as viewed by Giddens are conflated, and conflation renders the ignorance towards the analytical perspectives of certain concepts such as social system and interaction and agents. Layder (2006) continues that, through concepts of interaction, social systems and agents are presented logically in the structuration, but without proper underpinning from the empirical evidence, the existence of interaction between structures and agents cannot extrapolated to every society, as the technological developments affect unevenly the social systems in every society. In line with criticism from Layder (2006), I agree to lend the empirical support to the concepts such as interaction of digital technologies with social structures and resulting

employment opportunities for women in Saudi Arabia. Without assessing the views and opinions of organizations interacting with digital technologies and social actors (agents) within and outside the organizations, it is not possible to gain insight into how far the social systems can be supportive towards the inside and outside agents in terms of provisions and utilization of the employment opportunities created by the digital technologies.

Another criticism against structuration theory is that it focuses on the practical knowledge rather than discursive knowledge, which comes from overemphasis of Giddens on the power of agents and reflexivity of agents (Loyal, 2003). Giddens's views agents with powers, and omits the cultural dimension which may restrain or enhances the agent's power to interact with social systems. Hence, the emphasis on the practical consciousness and stress of the element of power in the structuration theory contradict each other, which is mainly due to the lack of cultural references to postulates of the structuration theory (Loyal, 2003; Craib, 1992). Moreover, Loyal (2003) admits that the lack of cultural references also makes the structuration theory as a foundation ground for researchers to investigate the possible outcomes resulting from the interactions between the agents and social systems under the influences of external stimulus such as digital technologies in different cultures.

Criticising the methodological guidelines and assumptions of the structuration theory, many critics argued that theory lacked clear guidelines and laws specifying its empirical applications in the social world, which renders it limited and controversial for the positivist researchers—ones who investigate the associations between social factors quantitatively (Barnes, 2001). Joseph (2006) also criticized the inability of structuration for determination of causal relationships due to recursive nature of relationships presented in the theory; and suggests that the application of structuration theory might suit the qualitative researchers who are interested in the portrayal of broader perspectives and in-depth analysis of relationships. In addition, Giddens himself emphasized that researchers investigating the relationship between institutions and agents should be aware of the complex skills of agents in the institutional context, which makes it more important to consider the characteristics of agents (outside and inside in institutions) for achieving certain outcomes such as pursuing careers in technologies. Shotter and Lannamann (2002) criticized that the complexity of agents' skills and institutional behaviors vary with time and space due to evolving nature of societies as envisioned by Giddens, which is difficult to be captured without gathering in-depth analysis of agents' characteristics within and without the institutions. Gregson (1989) directed his criticism against the structuration theory that it is abstract, second order theory which is far to be proved by the quantitative means.

Taken together, despite all criticism against the structuration theory, it is widely acknowledged theory in the literature considering knowledge-ability of agent-institution paradigm in the social phenomenon. It provides strong conceptual basis to interpret the relationships through the qualitative research tools, and offers guidelines for identify the methodological consideration and highlights the agents within and without institutions which can yield a meaningful data for determining the impact of digital technologies on the employment opportunities for women in Saudi Arabia.

In addition to that, structuration theory of Giddens offers an opportunity to understand the relationship between the employment opportunities created by the digitalization of Saudi society and the social structures which can either enable or restrain the change. Simultaneously, the possibility of women's power, skills and competencies in the digital applications for exploiting the job opportunities can also be understood through the lens of Giddens's theory. Most importantly, accentuation of Giddens's theories on the "possibility of individuals to enact change" as marked by Dixon et al. (2014) strengthen the proposition that women with digital skills can exploit the employment opportunities arising from digital

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technologies application through the repetitive display of the necessary skills for participation into job market.

Taken together, discussion on the Giddens's structuration theory predicts the interaction between the social structures and Saudi women at the labour market level, which can be meaningful if there is connecting force between Saudi women and social structures. Understanding the Giddens' structuration theory when interpreted in this context seems to put forward the digital knowledge, skills and competencies gained by Saudi women as a major force which connects Saudi women with the labour market. In other words, the digital education and training seems to be an important factor which needs to be taken into account for settling the debate whether there are employment opportunities. Assuming the criticality of digital education and training, women with better digital education and training would be in better position to avail the employment opportunities in digital technologies due employers' favorable attitude towards them.

Therefore, a thorough discussion about the digital education and training for women's employment is necessary for understanding the role of digital skills and competencies in enabling the women to grab the employment opportunities in digital technologies. The role of education and training for women's employment and evidence-based role of social structures in improving the women's digital competencies are presented in the next section.

3.5 Institutional and Policy Support for Building Digital Competencies

As derived from the Giddens's structuration theory, governmental bodies, institutions and policy-level support is important for allowing interaction between social structures and Saudi women. In this section, literature has been reviewed to show the extent to which the institutional and policy support was found to be useful in building digital competencies for women. The building of digital competencies of women is usually facilitated through the active involvement of the government and related institutional and policy with the educational and business organizations at the national level (Heeley & Damodaran, 2009). However, this is not clear to which extent the governmental as stakeholders become engaged with educational institutions and businesses to prepare the women for pursuing career in technologies (Sifuna, 2006).

Moreover, though it is true that national policies and governments play an important in setting the grounds for delivering the desired skills and competencies, but the willingness of women and raising the awareness among women about the connection between digital market and skills are important. The deployment of infrastructure for training and education of the women, especially in the gender-sensitive developing countries, can play a fundamental role in creating and promoting the digital competencies framework for supporting the women employment in the job market (Davaki, 2018). For example, Saudi Arabia is gender sensitive country where it is not possible for women to obtain training and education in the same academic and vocational institutions which train men. In such cases, the proliferation for the women-dedicated centres, vocational training institutes and university-level support structures can provide the adequate level of training to female students in the digital technologies (Al-Rajhi et al., 2012).

Another criticism on the government sponsored ICT projects aiming to promote inclusive practices at workplaces which highlighted that most of ICT projects were unable to integrate the gender analysis effectively, which resulted in failure of addressing the women's employment in ICT-related jobs in industries. Broadband Commission (2017) stressed on the need of e-governmental policies for collecting, analysing and tracking the data on women's employment, so that effective policies can be structured for increasing the women' competencies in digital technologies at national levels.

Taken together, from the above examples, it was clear that goals of digital competencies for women, participation in the digital economy for women were achieved through the active support from the governments in the developed countries in the Europe and the USA, which is in line with the assumptions supported by Giddens's structuration theory. The incentive structure for both industries and academic and training institutions were shown to be important factors for enabling women to fully participate in the job market created by the digital technologies. Broadcasting of women's positive public image in digital comes under the aegis of governments, which can overcome the stereotypical attitude of society which only attaches men to the digital transformation of society. There is a dearth of literature showing the initiatives and efforts directed by the government, employers and academic institutions for women in Saudi Arabia for enabling them to pursue careers in the digital technologies.

Saudi Arabia has also launched the plans for digital transformation of country via the Vision 2030 Program by encouraging participation of all citizens in creating and sustaining digital economy, nevertheless, policies and practices for preparing women to exploit the employment opportunities resulting from the digitalization of Saudi society are clearly documented in the literature, which warrants a research to investigate into perceptions of policy-makers and government as stakeholders to know whether the digitalization of society offers opportunities for women along with men, and what measures are being taken in order to ensure the women's participation in Saudi labour market (INISGHT, 2016).

Moreover, there is a lack of data as to which extent the government in collaboration with employees and academic institutions under Vision 2030 Plan is helpful in ensuring the participation of women in the establishment of digital economy. After all, digital skills and competencies are very important for allowing women to engage into the job market, nevertheless, it is not clear whether Saudi government have implemented any policies as part of Vision 2030 Plan for training and educating women to be part of the digital transformations within the country. This means there is the need for researchers to explore the employment opportunities arising from the digital technologies, therefore, Saudi government along with employers and academic institutions can be considered as important stakeholders in the process of enabling women to harness employment opportunities resulting from the digital transformation of Saudi Arabia.

The governments' practices and policies for building skills and competencies for citizens including women to build economy run in parallel with the practices developed and followed at academic institutions. Governments make policies in order to provide the businesses with workforce with required skills and competencies, while academic institutions implement government policies for delivering the right skills and competencies to students in order to fulfill the requirements of job market.

Therefore, it is important to review the evidence in literature regarding the role of academic institutions as an enabler or disabler for increasing the women' job opportunities through the delivery of digital skills to women. The next section discusses the link between the education system and building of digital competencies.

3.6 Education System and Digital Competencies for Women

Several feminist theorists have emphasized on the role of education system in increasing the employment opportunities for women by proving them with digital competencies (Chetty et al., 2018; Van Deursen & Van Dijk, 2011; West et al., 2019). West et al. (2019) highlighted the central role of education system in preparing the societies and workers to work to take advantage from thee exponential technologies. Van Deursen and Van Dijk (2011) have recognized the importance of digital competencies of women of workforce in leveraging the ICTs for creating sustainable economic development and innovations. Chetty et al. (2017) espoused the assumptions of Giddens's structuration theory, and posited that

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education system espoused by the government in educational institutions has transformed since the evolution of digital technologies, and for economic growth of countries, it has become essential to incorporate the education policies aiming at increasing the digital competencies for girls into the education policies. Anugwom (2009) showed that two of social structures: academic institutions and governmental bodies dedicated for up-skilling citizens were found to play an important role in education of employment, which resulted in increasing the participation of Nigerian women in the labour market. Another study conducted by Kemp (2013) identified the role of government in the UAE context in increasing the access of women to education, paving the way for 'societal acceptance of educated women' in the labour market, thereby supporting the emphasis of structuration theory on government as a main stakeholder in paving the grounds for increased participation of women in the labour market.

3.7 HRM Practices and Leadership in Building Digital Competencies

HRM is an important component of business which constitutes the third social structure which has been emphasized in the course of discussion on structuration theory, which may interact with other two stakeholders and with the Saudi women as well. In this section literature presented and discussed in this section are related to different social cultural contexts have been discussed with the purpose of highlighting the potential role of Saudi employers which may play a critical role in equipping the Saudi women with digital competencies. As the HR in a business is responsible for recruiting and training the employees to perform certain tasks effectively and efficiently, therefore, the discussion in this section revolves around what scholars and researchers have found or perceived about the HRM practices in building digital competencies of employees including women. An insight into the current developments of education and training in digital technologies for women can enable me to see the future prospects of women after digitalization of societies in Gulf countries. This will provide a comparative context of Saudi women in context of preparedness of women to exploit the potential job opportunities based on training and educational initiatives in digital technologies for women in Saudi Arabia.

3.8 The Current Development of Women's Technological Education and Training in the Gulf Region

Having considered both empirical research and theoretical perspectives for advancing the Saudi women's employment in digital technologies in the domain of new technology, I will now make the discussion more specific to the Gulf region in the name of presenting some primary issues later to be considered for the case of Saudi Arabia. Nonetheless, one should be equally aware that technological potential will not be fully exploited today, or in the foreseeable future, due to the lack of education and training in the required technology (Li & Herd, 2017). Such pessimistic predictions are supported by evidence provided by West (2015), who argues that between 2010-2020 the rate of the employment growth in digital technology in the STEM subjects of sciences, technology, engineering and Maths will become a severe problem of a lack of labour supply if the young have not been trained sufficiently in the STEM domains.

There are no proper infrastructure and social mechanisms in place for guiding and motivating females to join the digital technologies-related careers in Saudi Arabia, such as the absence of career counseling for women, the lack of family support, and the limited involvement of employers in reducing the gender divide at the organizational levels. Mathew (2010) emphasized that due to these structural problems few Middle East women join the digital technology sector is both a lack of career guidance and insufficient awareness of the opportunities available to them. At school, for instance, girls do not realise that the ICT sector can provide them with future careers that are independent of the traditional jobs available to females.

According to the Arab News (2016), the Saudi government's long-term aim to improve the national educational environment to prepare Saudi females for the labour force in two ways: through organisations and via the community. Firstly, the government has acted to encourage more intervention from firms to help women access the appropriate preparatory training for a professional career. Secondly, the government is raising social awareness of the contribution that women make as workers.

Nonetheless, other studies have concluded that it is human resource management that actually contributes the most to creating opportunities for women and breaking structural barriers through training and skills development program for women working or with promise to work with key positions in SMEs using digital technologies to support the business operations.

A lack of communication skills, access to stored information and only selective exposure and obstructive social norms are amongst the reasons why this knowledge gap continues to exist (Tichenor et al., 1970). In summary then, I would conclude that although the ongoing gender gap presents a challenge, both government and academia acknowledged this issue and efforts are being made to remedy the problem, including e-learning and vocational training.

4. Discussion

Several studies have indicated that there is plethora of job opportunities resulting from digitalization of society and industries for women and many studies have indicated the economic empowerment of women in OECD countries. However, there is a lack of evidence regarding the impact of digitalization of Saudi industries and society on women's employment; and emphasised for the need to investigate the impact of information and communication technologies on women's employment in tech-dependent SMEs in Saudi Arabia.

Furthermore, numerous theorists reviewed have emphasized the urgency of digital skills and competencies for enabling women to harness the job opportunities due to deployment of digital technologies, but they have not provided the mechanisms and ways to achieve the increased competencies and subsequently increased participation level in the labour markets in general, and in the labour market of Saudi Arabia in particular. Theories such as those relating to digital skills and women's employment are tested in the European countries, showing the positive link between women's digital competencies and employment. Nonetheless, none of research work is conducted, to the best of my knowledge, to assess what is being done to increase women's employment opportunities in digital technologies due to digitalization of Saudi economy. Moreover, the outcomes of studies reported for western countries cannot be extrapolated to the Saudi context due to differences in socio-cultural dynamics.

The social structures regulating the women's education and training such as government institutions, education institutions and the business organizations operate differently in Western and Saudi contexts. I assume that measures and initiatives run by government, employers in Saudi market and educational institutions, either standalone or in collaboration with each other, can help women to gain digital skills which will enable Saudi women to exploit employment opportunities arising from proliferation of digital technologies.

Another assumption driving this research work forward is that knowledge of the perceptions/viewpoints and experiences of participants in relation to digital technologies and women's suitability for digital employments in Saudi contexts is critically important of revealing interesting themes about women's employment in digital technologies. There is a lack of empirical evidence in Saudi Arabia as to how social structures view digital competencies for women for purpose of gaining economic empowerment,

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and what is being done to increase the digital competencies and skills for Saudi women. Studies along this direction will more likely provide an insight into perceptions of participants about the initiatives and measures being taken to increase the digital competencies of Saudi women, which will in turn enable researchers to assess the employment opportunities for Saudi women in digital technologies.

There is a dearth of empirical evidence in Middle East, especially in Saudi Arabia, which can portray the perceptions of government, academic institutions and HRM policies for encouraging women to participate in the labour market as a result of digitalization of Saudi society. This framework encourage future researchers to fulfil this research gap by including the organizational leadership from government, businesses and academic institutions and exploring their views about the impact of digitalization of businesses and opportunities arising from women aspiring to pursue careers in digital technologies. It is expected that data from the business groups will reveal as to what HRM policies are underway due to digitalization of businesses for supporting and promoting women's aspirations to develop careers in digital technologies.

5. Conclusion

In this paper, several theories are discussed while presenting the factors that are necessary for increasing women's employment opportunities resulting from proliferation of digital technologies in Saudi Arabia. The social construction of Technology theory, technology domestication approach, and the structuration theory offered insight into the major stakeholders involved in improving the impact of digital technologies on the women's employment.

Based on the literature surveyed in this paper, the review found agreement from most of the researchers that women need to empower themselves within the technology field and remove the digital gender divide. Education and training for increasing digital competencies of women along with the roles of institutional policies (business-oriented organizations, public sector organizations) are main drivers in enabling women to exploit the work opportunities created by the digital technologies for achieving economic empowerment. Hence, perceptions of women, and attitude of social structures including government officials, organizational leaderships and academia can provide a useful insight into the strategies, processes and structures being employed for training women in digital technologies, consequently, the level of digital competencies can further illuminate the capability of women to harness the job opportunities resulting from the digital technologies. And there is therefore the need for adoption of relevant approaches to address the research issue relating to the impact of digital technologies on the women's employment in Saudi Arabia. This is one of the limitations associated with document analysis work. In the future, there is need to consider a research work on this area which will be based on an extensive field work drawing information from government officials, organizational leaderships and academia to assess key areas for improving opportunities for women's employment in digital technology.

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