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The Digital Social Capital to Career Success and Its Implication to Industrial Revolution 4.0

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Abstract. This paper aims to explore the implications of the industrial revolution 4.0 on the development of the concept of social capital. The concept of social capital experienced the evolution of thought. Initially, the concept of social capital was conceived of as social cliques [1], norms of reciprocal [2], trust [3], and mentoring networks [4]. Furthermore, Seibert, Kraimer, and Liden [5], integrate the concept of social capital from three different theoretical approaches (weak-tie theory, structural hole theory, and social resource theory) and Kistyanto [6] integrate the concept of social capital from four theoretical approaches (trust, social cliques, social networking, and social obligation). Based on the theories above, social capital is highly influence employee's career success on the dimensions of financial success, hierarchical success, and career satisfaction. In the other side, the ability of company to utilize its social capital has resulted many remarkable Industry 4.0's inventions such as artificial intelligence, robots, block chain, nano technology, quantum computers, biotechnology, the Internet of Things, 3D printers, and unmanned vehicles. In return, the digital social capital including digital trust, digital social cliques, digital social networking and digital social obligation emerge as the implications of the industrial revolution 4.0. Digital social capital becomes a new concept in the development of social capital theory.

Keywords: *Digital social capital; digital social cliques; career success; industrial revolution 4.0.*

1. INTRODUCTION

Industry 4.0, also known as the 4th Industrial Revolution, is the new shift paradigm that embraces latest technologies to boost industrialisation at local and global scales. The new paradigm of Industry 4.0 is rapidly spreading worldwide. This revolutionary concept offers the story of the next Industrial Revolution as a flexible platform where technologies and the Internet are pervasive means to do businesses and manufacturing [7]. Industry 4.0 enables a whole network of interconnected, dynamic, collaborative, reconfigurable, self-organised and personalised business services and manufacturing interactions [8], [9].

The industrial revolution 4.0 has implications for

theoretical developments. Research trends are starting to study the fields of technology and people. An example of this is the cyber-physical production systems (CPPS), which are systems with collaborative and autonomous components that are connected to each other at the different levels of production and logistic processes [10]. Machine Tool 4.0, which is regarded as the self-aware, self-maintained and self-optimised smart machine tool, can provide assessment of its current and predictive used condition [11]. Cyber-physical machine tool (CPMT) is proposed as a CPS application that integrates tooling, processing, networking and embedded computing to monitor and control machining process [12]. CPSS [13] and human-cyber-physical systems (HCPS) [14] are two of the examples that stress the integration and interaction among the

physical, digital and human world. Moreover, the evolution of past, present and future of intelligent HCPS has been explained, and it is expected that future systems will strengthen industry and human society by leading the path to an “age of intelligence” [15].

The industrial revolution 4.0 has implications for the development of the theory of human capital and social capital. Flores et al., [7] proposes a new approach and term with a human-focused perspective in order to meet the challenges of the future labour force. This new term is “Human Capital 4.0”. Individuals with more investments in their human capital could develop professional expertise, increase productivity at work, and then get positive rewards from organizations [16]. Another vital factor is social capital. Human capital and social capital are interrelated [2] and positively related to organizational success ([17]. That is, individuals gain social capital because, in comparison to others, they occupy more advantageous network positions, which allow access to a variety of people with the necessary information and the chance contribute to organizational functioning, thereby gaining more positive career outcomes, such as faster promotions [18] and career success [5]

In previous studies, career success has been defined as either objective, subjective or an intersection of subjective and objective parameters. Career success was used as the ultimate result individuals aim to achieve through the specific behaviours they apply in the working place [19]. For example, Restubog et al. [20] and Adamson et al. [21] view career success as an objective parameter and operationalise it in terms of reward, status, position, etc. On the other hand, authors such as Hall [22], Schworms et al. [23] and Ng and Feldman [24] define it as a subjective parameter and use such proxies as job satisfaction, career satisfaction, life satisfaction and work– life balance. In contrast, Converse et al [25], Arthur et al. [26] and Spurk and Abele [27] use the intersection of subjective and objective parameters in measuring career success.

This paper aims to explore the implications of the industrial revolution 4.0 on the development of the concept of social capital. In addition, integrate the concept of social capital from four theoretical approaches (trust, social cliques, social networking, and social obligation) that greatly influence employee career success.

2. BACKGROUND

2.1 Social Capital

Social capital is conceived as a mentoring network that investigating variations in the source of mentors used by low, middle and top professional towards their career success [4]. Social capital is also interpreted as an affiliation between members of social cliques in

which the the affiliation between fellows of social clique tends to be strong but the affiliation outside the social clique tends to be weakened [1]. Social capital lies in the structure of the relationship between person with oneself, and not on the individual or physical equipment. Furthermore, Coleman [2] [28] stated that this social structural resource as an asset of capital for individuals. Coleman focuses on norms as resources for social capital, and also establishes various aspects of social relations that shape social resources such as obligations, expectations, norms and sanctions, relationship authority, and social organization. Social capital in the form of high trust reduces the need for expensive monitoring processes. Thus, social capital also reduces the transaction costs [29]. Trust encourages cooperative behavior which enable the development of new forms of group or a new association of innovative organizations [3]. The other significant research on social capital that should be considered is a research conducted by Seibert, Kraimer, and Liden [5] that integrate the concept of social capital from three different theoretical approaches, namely weak-tie theory [1], structural hole theory [18], and social resource theory [30]. Although Seibert's research, et al. [5] provides considerable findings relating to a more holistic concept of social capital in which the cultural aspects of trust and norms of reciprocity based on Putnam [29] and Fukuyama [3] are the most important dimensions of social capital. Therefore, it encouraged Kistiyanto [31] to conduct a study of social capital with applying measurements based on integrated trust, social conditions, networking, and social obligation.

2.2 Career Success

The concept of career can be interpreted as a situation of individual who pursuing work (internal careers) as well as organizations which create an appropriate development paths for employees. This path is followed throughout employees working period in an organizational context (external career). By considering the internal-external career dimensions, a career success can be assessed both in objective career success' criteria and subjective career success' criteria. In a concept of career, there are ideas or thoughts about progress or development that based on previous studies of career success' criteria such as job title, salaries, and promotions [32].

As stated by Gattiker and Larwood [33], the concept of subjective career success indicates a construct that only exists in people's minds and has no limitation. Gattiker and Larwood's observations provides inspiration that needs to be re-examined if someone considered successful based on the subjective criterias as well as success based on the objective criterias.

The study about career success can be examined

from an individualistic perspective. In an individualistic perspective, the individuals are the main agents to determine their careers, but they are not too involved in determining the career system in organizations. If the labor market represents opportunities that open to all employees, the success of an employees' career depends on their effort, ability, education and training [34]. Nevertheless, the internal labor market in State-Owned Enterprises (SOEs) does not describe opportunities that open to all employees. The promotion of positions that occur in a state-owned enterprise is not only based on employees' efforts, skills, education and training as suggested by Becker [34], but also determine by their networking (connection). Moreover, this research will test empirically whether social capital, one of which is measured from the dimension of connection, affects the career success of managers.

2.3 Industrial Revolution 4.0

Currently, the 4.0 industry revolution marked by the use of new technology in various fields, such as artificial intelligence, robots, block chain, nano technology, quantum computers, biotechnology, the Internet of Things, 3D printers, and unmanned vehicle. The Cyber Physical System and the Internet of Things and Services from Industrial Revolution 4.0 have implemented into industrial processes including in manufacturing and logistics and other processes [35]. Cyber physical system is a technology that combine the real world with the virtual world and manifested through integration between physical and computational processes, namely embedded computer technology and close loop networks [36]. Hermann, et al [37] added that the Industrial Revolution 4.0 is a term to refer to a set of technology and value chain organizations in the form of smart factories, CPS, IoT and IoS. Smart factory is a modular factory with CPS technology that monitors the physical processes of production and then displays it virtually and decentralizes decision-making. Through IoT, CPS is able to communicate with each other and work together in real time, including humans, which can be used by every stakeholders from both internally or between organizations.

3. DISCUSSION

3.1 Social capital and career success

The theory of *weak tie* [1] states that the bond (affiliation) between members of social clique tends to be strong; emotionally very intense, the frequency often occurs, and involves multi-relationships such as friends, advisors, and co-workers. Information owned by members in these social cliques is likely to be shared quickly with other members. While ties that outside the members of the social clique tend to weaken, in the sense that they are not emotionally intense, the

frequency does not occur often, and is limited to only one type of narrow relationship. Kistyanto's research [6] shows that the social cliques significantly influence career success.

According to the *structural hole theory* [18] the structural gap between two alters are not related to each other. Therefore, it is very beneficial for the ego to connect with many alters that previously were not connected with other alters in the ego network. Thus, the ego associated with two alters that were not interconnected with each other will bridge or mediate the two alters.

Fukuyama [3] states the core of social capital is a trust. It is because a trust will underlie and strengthen the other parameters. Without a trust, other parameters cannot be implemented properly. To be able to work together, help one another, form partnerships, spread norms, and be committed, a mutual trust is needed. Social bonds have a positive effect on career success [31]. This implies that the managers assume that the social relations must be based on mutually beneficial principles such as social bonds, such as obligations to repay services to others who have helped as an expression of gratitude. This fact is consistent with the theory of Bourdieu [38] that mentioned in the social relations such as friendship, there is a mandate called "credit" that must be paid back as a compensation (debt of gratitude).

3.2 Digital social capital and career success in industrial revolution 4.0

The current Industrial Revolution 4.0 has implications on the transformed conceptualization of social capital to become digital social capital. Digital social capital can be interpreted as the amount of actual and potential resources that exist in digital trust, digital social cliques, digital social networking, and digital social obligation owned by a person or organization.

Digital trust is honesty that is owned by someone that made him deserved to be trusted in the digital world. Behaving inconsistent manner, responsible / trustworthy, mutual respect / respect, and sincerity are some of someone's digital trust domain in digital world.

Digital social class is a social group in the digital world which the emotional ties between its members that tend to be strong, emotionally intense, interactive and supportive each other, and involving multiple relationships such as friends, colleagues, friends.

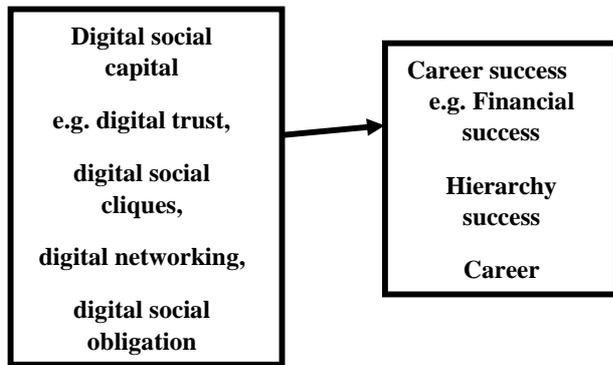
Digital social networking is a form of social relations built in the digital world that consists of individuals and organizations that interrelated and bound by one or more specific types of relationships. This digital social networking is like someone's membership in a social media group such as Facebook, Twitter, Friendster, Myspace, LinkedIn, Google+, WAG, etc. The membership in this digital social

network allows one to interact with colleagues, superiors, subordinates, and the public from diverse professions and job title.

Digital social obligation is a norm of reciprocity in the digital world that describe the level of consensus in a social system, where individuals provide services to other individuals at the expense of something but with a general expectation that this good will be returned in the future.

3.3 The Conceptual

The conceptual shift of social capital to digital social capital as an implication of the industrial revolution 4.0 can be described as follows:



4. CONCLUSION

Based on the theories above, social capital is highly influence employee's career success on the dimensions of financial success, hierarchical success, and career satisfaction. In the other side, the ability of company to utilize its social capital has resulted many remarkable Industry 4.0's inventions such as artificial intelligence, robots, block chain, nano technology, quantum computers, biotechnology, the Internet of Things, 3D printers, and unmanned vehicles. In return, the digital social capital including digital trust, digital social cliques, digital social networking and digital social obligation emerge as the implications of the industrial revolution 4.0. Digital social capital becomes a new concept in the development of social capital theory.

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