

Adapting to the Digitalization of Low-Skilled Work

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Introduction

Existing research on the digitalization of work largely focused on the digitalization of skilled work with very little research directed towards low-skilled work. Yet, the waves of digitalization has no partiality between the two types of work. In all likelihood, given their lower skills endowment, blue-collared low-skilled workers are prone experience greater challenges adapting to the digitalization of their work as compared to white-collared skilled workers (West, 2018).

Research showed that low-skilled work is at greater risk of being digitalized, leading to the elimination of some low-skilled work as well as changes to job-scope and increase complexity of digitalized work for low-skilled workers (Balsmeier & Woerter, 2019). To remain relevant, and to remain gainfully employed, low-skilled workers often have to adapt by reskilling and upskilling themselves with the digitalization of their work. Thus, if these low-skilled workers are unable to adapt, they face the risk of being made redundant in the digitalized workplace, widening their socio-economic inequality vis-à-vis skilled workers (Balsmeier & Woerter, 2019). This in turn can lead to social rift and political issues that can cripple the fabric of societies and nations (West, 2018). Hence it is important and needful to know what can be done to support low-skilled workers in adapting to the digitalization of their work, ensuring that they are not left behind even as more and more workplaces are digitalized. Insights from such research can inform policy makers, employers, managers, labor unions, human resource practitioners, career counsellors and those involved in job design and digitalization of work. Appropriate support schemes can then be put in place to advance digital inclusiveness (Trauth & Howcroft, 2006; Warschauer, 2003) and achieve digitalized workplaces that are inclusive.

This paper addresses such a need by asking the research question ‘How to facilitate low-skill workers adaptation to digitalized work?’. It presents the preliminary analysis of an exploratory case study on the interventions taken by managers of low-skilled workers in facilitating their adaptation to the digitalization of their work.

Career Construction Theory

Career Construction Theory is leveraged as a theoretical sensemaking lens in the case

data analysis to theorize how workers adapt to the digitalization of low-skilled work. The theory posits that individuals adapt to changing demands of work through personal constructivism and social constructionism, viewing careers as protean and contextual processes of self-construction (Savikas, 2002, 2013). This self-construction process is essentially an adaptation to occupational transition, which may be planned or unexpected, due to promotion or demotion, as well as desired or loathed. The focus of the adaptation is to harmonize misfits between the external opportunities/threats in the work situation and the inner needs and endowment of individuals.

According to the theory, as illustrated in Table 1, the adaption consists of four Dimensions, with each Dimension having corresponding Attributes and Beliefs. Each of the four Attributes and Beliefs is in turn manifested through certain set of Behaviors. These are illustrated in Table 1 and described as follows.

Table 1: Career Construction Theory

Dimension	Attribute & Belief	Workers' Behaviors
Concern	Planful	Aware Involved Preparing
Control	Decisive	Assertive Disciplined Willful
Curiosity	Inquisitive	Experimenting Risk Taking Inquiring
Confidence	Efficacious	Persistent Striving Industrious

The first Dimension of *Concern* refers to the concern of individuals in adapting their careers to be future-ready. It connotes the Attributes and Belief of being *Planful*, where individuals actively plan for occupational transitions in anticipation and in preparation for the imminent, and maybe also the distant future. The manifested Behaviors for this Dimension include being *Aware* of the impending disruption, and being actively *Involved* in *Preparing* for the transition and disruption at work.

For the second Dimension of *Control*, individuals begin to take control by deciding on the vocational development tasks and negotiating the occupational transitions as they adapt to new realities and demands at work. Hence, it connotes the Attribute and Belief of being *Decisive*. Even for individuals with limited means and have minimal options and leeway within their control, they may still manifest the Behavior of being *Assertive* in deliberating over the narrow range of possibilities, fine-tune the available choices, in making it personally meaningful and purposeful. Often, individuals will also be *Disciplined* and *Willful* in controlling how they adapt.

As individuals take control, they also start to be inquisitive and explore the occupational

opportunities available to them in adapting to the future of work, giving rise to the third Dimension of *Curiosity*. This is marked by the Attribute and Belief of being *Inquisitive*. The Behaviors manifested include *Experimenting* with different possibilities, *Risk Taking* in trying out new job functions or tasks, and *Inquiring* about different possibilities and options available.

The final Dimension is *Confidence*, where individuals gain self-efficacy and self-esteem in being able to adapt to new demands and reality at work. Hence, it is denoted by the Attribute and Belief of being *Efficacious*, where individuals anticipate success in their occupational transitions and believe that they are able to overcome impending challenges and obstacles. The manifested Behaviors for this Dimension include being *Persistent* in face of difficulties, *Striving* for success, and *Industrious* in sharpening their skills and capabilities needed to take on new job scope and tasks.

Research Design & Findings

The case study is based on a company in the cleaning industry that employs low-skilled workers as cleaners, which is an understudied occupational group in digitalization research. The company has been lauded for successfully adapting their workers to the digitalization of low-skilled work through adopting an array of digital technology such as AI-enabled cleaning robots, Internet-of-Things sensors, and mobile apps in digitalizing their work practices. Much of the cleaning work is now substantially augmented by cleaning robots, with the cleaners performing a more supervisory function, intercepting the robots via mobile apps when the situation calls for it, or complementing the robots in cleaning where the deployment of the robots would not be efficient.

Data collection is based chiefly on semi-structured interviews, with secondary data on the cleaning industry, the company, and the work of cleaners being sourced from the Internet, news and official reports. In all, 19 interviews are conducted with managers of the cleaners, with all the interviewed managers having been involved in some form of work digitalization such as the introduction of various types of cleaning robots, Internet-of-Things enabled smart toilet, and smartphone applications.

An interpretive stance is adopted in analyzing the case data, adopting Career Construction Theory as the theoretical sense-making lens in understanding how managers facilitated the adaption of their workers. Essentially, each of the four Dimensions of the Career Construction Theory served as a guide to identify corresponding interventions taken by the managers in facilitating the low-skilled workers adaptation to digitalized work. In all, nine different types of interventions by managers are identified: 3 Interventions under Concern, 2 Intervention under Control, 3 Intervention under Curiosity, and 1 Intervention under Confidence. These are presented below in Table 2-Table 5.

Table 2: Concern Intervention

Dimension	Intervention	Definition	Exemplary Quote
Concern	Inform	Informing the	<i>"We always hold town hall sessions with the staff"</i>

		workers about impending plans to digitalize their work so they can be prepared for the changes.	<i>and representatives from different various sites, from different ranks. To invite them in, to actually share with them the vision that the management has...So other than town halls and quarterly staff engagement, we also send out circulars for them to put on their noticeboard in 4 languages, there could be certain things that we need to accomplish or whatever...So that everybody knows."</i>
	Aware	Provide general digital literacy education and create digitalization awareness among the workers	<i>"They won't understand how to operate hand phone. They won't use, don't know how to use hand phone, how do you press this, how you press that. We need to take time to educate them and teach them along the way."</i>
	Assure	Assure workers that they will not be losing their job to digitalization	<i>"You have to keep emphasize to them, like robot is not to replace your job. Robot is actually assist your job or support, supplement."</i>

Table 3: Control Intervention

Dimension	Intervention	Definition	Exemplary Quote
Control	Involve	Actively engage the workers to get their feedback and involve them in designing the new digitalized work processes	<i>"We also wanted to hear their feedback...So, recently, actually we have, our management group, we have actually so-called site visit. We have organized site visit...when we will go down and go around with the staff there and hear from their challenges as well...they will tell me that the Wi-Fi is very bad, I cannot access, your app is so difficult to use, things like that. So, we, actually, when we [are] doing the design, we try to be very mindful."</i>
	Bounded-Autonomy	Enabling the workers to have some limited control over the pace of digitalization	<i>"We already placed it in their store and let them use it. So, they determine [which] is the cleaning [technology] they want to use...But once we think that it's more to negative thing, like for example, they keep on reminding, saying that 'Oh, I can't use, I can't use, I can't use', then, I need to step in to educate them again."</i>

Table 4: Curiosity Intervention

Dimension	Intervention	Definition	Exemplary Quote
Curiosity	Encourage	Encourage the workers curiosity in exploring and trying out digitalized work	<i>"At first, we will show, we will talk to them and encourage them to use these robots...Instead of you doing the work, why don't we get this robot to do it for you. And they saw also the operations [of it]. So we will slowly encourage them."</i>
	Accommodate	Accommodate for failed attempts during the initial adaptation to digitalized work	<i>"I will need to tell them that, 'Uncle, for first time, I understand. Certain things, I can explain as accident [happens]...we will provide you with the knowledge and share with you how to avoid it. [When] things happen, we will try to, you know, understand from your part. As a company, we will try to understand because it's something new that you need to learn."</i>
	Incentivize	Incentivize the workers to take on digitalized work.	<i>"They will have like a machine allowance...it will come in once they are savvy in using it."</i>

Table 5: Confidence Intervention

Dimension	Intervention	Definition	Exemplary Quote
Confidence	Equip	Equip the workers with relevant tools and training to sharpen their proficiency in performing digitalized work.	<i>“So the more trainings they go, the more confidence they gained along the way. Holding on to something that is digital and technological, they are no longer afraid. Like they are used to. Yes, so training is a must and trainings actually allow them to gain confidence.”</i>

Conclusion

This research is an attempt to address the research question ‘How to facilitate low-skill workers adaptation to digitalized work?’. It examined how managers at a lauded cleaning company structured the adaptation of their workers to the digitalization of low-skilled work. The preliminary case analysis yielded nine interventions across the four Dimensions of the Career Construction Theory. In terms of implication to research, it addresses the existing gap in research on the digitalization of low-skilled work. In terms of practice, it can be referenced by policy-makers and practitioners in facilitating the adaptation of workers to the digitalization of low-skilled work. It is hoped that such research will bring about greater digital inclusion (Trauth & Howcroft, 2006; Warschauer, 2003) and consequently a more inclusive society and world.

References

- Balsmeier, B. and Woerter, M. (2019) Is This Time Different? How Digitalization Influences Job Creation and Destruction. *Research Policy*, 48, 103765.
- Savickas, M.L. (2002) Career Construction: A developmental theory of vocational behavior. In D. Brown & Associates (Eds.) *Career Choice and Development* (4th ed., pp. 149-205). Jossey-Bass.
- Savickas, M.L. (2013) Career Construction Theory and Practice. In S.D. Brown & R.W. Lent (Eds.) *Career Development and Counseling: Putting Theory and Research to Work* (2nd ed., pp. 147-183). John Wiley & Sons.
- Trauth, E.M., & Howcroft, D. (2006) Social Inclusion and the Information Systems Field: Why Now? In E. Trauth, D. Howcroft, T. Butler, B. Fitzgerald, and J. DeGross (Eds.), *Social Inclusion: Societal and Organisational Implications for Information Systems* (pp. 3-12). Springer.
- Warschauer, M. (2003) *Technology and Social Inclusion: Rethinking the Digital Divide*. MIT Press.
- West, D.M. (2018) *The Future of Work: Robots, AI and Automation*. Brookings Institution Press.