EPiC Series in Education Science

Volume 4, 2022, Pages 42–56

Proceedings of NEMISA Summit and Colloquium 2022: The Future of Work and Digital Skills

Operationalizing the Future of Work to Measure Job Susceptibility

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Abstract

This paper focuses on operationalizing the diverse discourses on the Future of Work (FoW) into a research model and instrument to measure the impact on job susceptibility in any given sector. Over the last few decades, the central focus in the discourse of the FoW has mainly been on how technological advancements have substituted jobs and skilled labor through the simplification of tasks. This has been at the expense of other non-technological factors that influence the FoW. The discourse on the FoW has also been difficult to operationalize with most of it being theoretical and conjectural. The paper adopts an abductive methodology, making use of a critical literature review and Santana and Cobo's (2020) bibliometric review of the FoW. The resultant FoW model and instrument enable the measurement of job susceptibility in any sector and are useful for operationalizing the highly abstract and theoretical concept of the FoW. While the primary trigger for the FoW is innovative technological advancement, the discourse has often ignored the equally important and complementary political, social and economic forces that accompany any industrial revolution. The FoW model and instrument have considerable implications for individuals and organizations as they present a clearer picture of the job risks and opportunities available for skills development. The instrument, subject to empirical validation, holds potential to provide a more holistic projection about the impact of future industrial revolutions as they unfold. The FoW instrument can be used to measure job susceptibility in any sector. The recommendations from each sector can be used to plan and respond to social, political and economic changes affecting work that is affected by technological advancements. The instrument enables relevant stakeholders, policy makers and decision makers to better understand future prospects in different fields in order to plan and prepare workforces accordingly. It also means that society can better prepare and avoid unnecessary displacement of workers. The paper is exploratory and future work will involve the empirical validation of the research model and instrument.

H. Twinomurinzi, N. Msweli and T. Mawela (eds.), DigitalSkills2022 (EPiC Series in Education Science, vol. 4), pp. 42–56

1 Introduction

Technology has been reorganizing the way people work since the invention of the wheel. The discourse on the role of technology in employment dates back more than 500 years ago when technological innovations notably began to transform production, trade and human livelihoods. In recent decades, the term "Future of Work" (FoW) emerged, describing a topic of interest focused on how shifts in the political, economic, social and technical environments would reshape work, how it would be done, employment opportunities, and threats facing workers. In particular, the role of digital technologies in shaping the FoW has gained prominence as a field of research driven by the rapid advancements and their disruption of business and society. For example, Travaly & Muvunyi (2020) predict that by 2030, artificial intelligence (AI) will contribute $15.7 trillion to the global GDP. They attribute this growth to increased productivity from consumption effects. They add that augmentation between AI and people will enhance performance and consequently create $2.9 trillion of business value and 6.2 billion hours of worker productivity globally. Empirical data also shows that, globally, organizations are embracing digital technology, ultimately to gain efficiencies, reduce costs, enhance productivity and improve market share and profit margins. The World Economic Forum (2020) notes that companies are increasingly moving to restructure their workforces, transform the composition of their value chains, introduce further automation and expand their workforces to achieve deeper technological integration.

The impact of digital technology on the FoW is inevitable, and the political, economic and social environments must adapt accordingly to ensure that the outlook for the job market is positive. While there is a growing body of literature surrounding the problems and opportunities, there are limited solutions on how to address the identified challenges and prepare the workforce for the changes that are imminent. The implications of being ill prepared are that the social and economic benefits of the technological revolutions will be missed, while workers will face the threat of job losses and displacement. This paper therefore aims to operationalize the extant literature on the FoW and create a model that could help measure job susceptibility as a result of the FoW in any sector. The proposed model should inform or support decisions relating to the pursuit of alternative career paths, skills, education and occupations that will be relevant in the future. This would also enable sectors to better prepare their workforces, or even for individuals to prepare themselves to function in sectors that are changing dynamically. For example, in what some are already labeling the 5IR, such a FoW model would enable a sector to prepare for the changes the advancements will bring. The rest of the paper is structured as follows; the next section describes the methodology that will be applied. The subsequent section presents the literature on FoW. The results are presented in the discussion and findings section. The conclusions of the study are presented in the final section.

2 Methodology

This study makes use of an abductive approach and a critical literature review of key studies to build on Santana and Cobo's bibliometric analysis on discourses of the FoW. Abductive methods embed both inductive (from empirical observations to patterns) and deductive (from patterns to empirical observations) to make sense of phenomena (Tolani and Twinomurinzi, 2019). In this study, Santana and Cobo's (2020) bibliometric analysis on discourses of the FoW provided the base model (deductive), while a critical literature review (inductive) was used to reinforce the model. Table 1. summarizes the results of the abductive process with the identified themes and presents the key constructs and their items.

Table 1: Summary of key themes and resultant questionnaire items

CLASSIFICATION	THEME	DESCRIPTION	QUESTIONNAIRE ITEMS **Rate the statements using the Likert scale below about your sector:** **Likert scale: 1 – strongly disagree – 5 strongly agree**	
Political factors	Industrial relations	Describes how labor institutions evolve (Santana & Cobo, 2020). Suggests that changes in the nature of work lead to structural and process changes in organizations (Singh et al., 2021). New forms of work are emerging and workers' rights, income are compromised.	P1 P2 P3	Organizational processes and structures are evolving to suit changes in the workplace. New forms of work compromise workers' rights. New forms of work compromise workers income.
	Trade unions	Strong trade unions protect the interests of vulnerable workers and precarious jobs, and avert inequality (Anner & Pons-Vignon, 2019) The influence of trade unions is threatened by changes in the forms of work (Visser, 2019)	P4 P5 P6 P7	Trade unions protect the interests of vulnerable workers. Trade unions protect precarious jobs. Trade unions avert inequality. Trade unions have a declining influence.
	Educational policy from institutions	Public educational policy should respond to the needs of the workplace. Public education institutions should teach 21st century skills that promote the skills and capabilities to adapt to technological changes. There is a need for supportive programmes to keep vulnerable workers in the labor market (Gruen, 2017)	P8	Public education is adapting to respond to the changing education and skills demands in this sector.
	Labor market	The balance of power between employers and workers is shifting with new forms of work such as gig work, telework.	P9 P10	The job market has become more competitive Workers have less bargaining power.

		The job market is more competitive, with workers settling for lower wages with no career progression or basic conditions of employment.	P11 P12	Employers have more bargaining power. There is a gap between the skills required and the available skills.
Economic factors	Wage inequality	The balance of power between employers and workers has changed, causing a higher incidence of wage inequality. This corresponds with the rise of the gig and platform economies and rising unemployment due to technology displacement and job polarization.	E1 E2 E3 E4	Wages are fair for ordinary workers. Wages are fair for precarious workers. Basic conditions of employment are fair for ordinary workers. Basic conditions of employment are fair for precarious workers.
	Employment	Certain jobs are being made redundant, while the demand for certain workers in certain occupations is increasing and new jobs are emerging.	E5 E6 E7	There are adequate job opportunities. Certain occupational types are becoming redundant. New occupations are emerging.
	Job Polarization	New technologies have reduced the demand for workers performing easily mechanized routine tasks. Low paid jobs are most affected by job losses associated with new technologies. There is a higher relative demand for jobs that that require greater creativity or manual or interpersonal skills. Jobs in the upper wage bands (that require creativity and problem solving) and lower wage bands (requiring manual labor) are in increasing demand.	E8 E9 E10 E11 E12 E13 E14	Jobs in the sector can be easily mechanized, automated or computerized. Jobs in the sector pay medium to high wage. Jobs in the sector require medium to high skills. There is a higher demand for jobs requiring creativity skills There is a higher demand for jobs requiring emotional intelligence skills There is a higher demand for jobs requiring leadership skills There is a higher demand for jobs requiring problem solving skills
Job susceptibility	Job susceptibility	Jobs are at risk.	E15	Jobs are at risk.
Social factors	Job precarity	There is a sense of job	S1	Workers feel a sense

		and income insecurity.	S2	of job insecurity. Workers feel a sense of income insecurity (for example earn less in moving from permanent to gig work)
	Satisfaction	Changes in technology have affected the job satisfaction of workers.	S3	Workers feel dissatisfied with their jobs.
	Burnout	Changes in technology have resulted in burnout of workers as they try to adapt.	S4	Workers experience burnout in their jobs.
	Work life balance	Changes in technology have resulted in a poor work life balance for workers as they try to adapt.	S5	Workers experience a compromised work-life balance.
	Vulnerable workers	Certain demographic groups, particularly older workers and less technology savvy workers are at risk of job losses due to the changing demands of their jobs.	S6 S7	Older or less technology savvy workers feel insecure in their jobs. Gig workers are treated unfairly
	Talent	There are efforts to attract and retain the right talent to fit the new paradigm of jobs.	S8	It is difficult to attract the right talent for the available jobs.
	Career	There is a need for constant career development to meet the changing demands on workers.	S9	There is adequate career development to meet the changing needs of workers.
	Leader's values	Leaders' values should respond to the needs of the organization and workers amidst the changing technological environment.	S10	Leaders' values respond to the changing needs of the organization.
	Corporate social responsibility	Companies have a responsibility to engage in good governance, fair business practices and investment into developing their workforce and ultimately contributing to the talent pool of the market.	S11 S12 S13	Organizations in the sector have good governance practice Organizations in the sector have fair business practices. Organizations in the sector invest to develop their workforces.
Technological	Gig work	Gig workers fall within the classification of new forms of work, where	T1	Contractors can be appointed to fulfil specific job roles

		workers have no long term formal contractual arrangements with an employer and operate as contractors to fulfill very specific roles or tasks.		
	Telework	Refers to the ability to away from a formal, physical workplace. This form of work has become much more widespread since the start of the global Covid 19 pandemic.	T2	Workers can fulfill their work remotely
	Automation	This phenomenon refers to the ability for jobs or tasks to be completed partially or fully by technology.	T3	Jobs will be partially or fully replaced by technology
	New forms of work	'New forms of work' is an umbrella term that describes how traditional working arrangements are changing and relates to the place, time and nature of work, as well as the contract between worker and employer.	T4 T5 T6 T7	The types of contracts between employer and employee are changing. The place in which work takes place is changing. Working hours are changing. The type of work required from workers is changing.
	Crowd work	Individuals outside of the organization can pitch to fulfil projects or roles.	T5	Individuals outside of the organization can pitch to fulfil projects or roles.
	Innovation	Refers to changes in processes and systems that allow organizations to deliver products and services more efficiently and effectively.	T6 T7 T8 T9	There are innovations to processes that make work more effective. There are innovative systems that make work more effective. There are innovations to processes that make work more efficient. There are innovative systems that make work more efficient.
	Digital Transformation	Refers to changes in the industry and organizations brought about by new digital technologies.	T10	Digitization has transformed how work is done.

	E-HRM	Refers to changes in how the HR function is managed through digital technologies.	T11	The Human resource function is managed primarily through electronic processes
	HR Analytics	Data analytics can be used to monitor worker data and track performance. This is unsettling to workers and may lead to violations of worker privacy.	T12	Analytics plays an important role in the success of the organization.
			T13	Data analytics is used to monitor worker performance
			T14	Data analytics is used to track worker data.
			T15	Workers feel unsettled by the use of data analytics to monitor their performance.
			T16	Workers are unsettled
	Virtual HR	HR functions can be delivered effectively through employee self-service portals and other electronic mechanisms.	T17	Some HR services are delivered virtually.

3 Literature Review

Schwartz, Hatfield, Jones and Anderson (2019) define the future of work as a consequence of forces shifting what work will be done, who will do the work and where the work will be done. Santana and Cobo (2020) expand on this definition by classifying the drivers of the FoW into four categories: political, economic, social and technological. Balliester and Elsheikhi (2018) classify the FoW into five dimensions: the future of jobs; job quality; wage and income inequality; social protection systems; and social dialogue and industrial relations. While many authors do not attribute a timeframe under which the future is considered, many studies generally hold a view of a decade ahead. For the purpose of this paper, we define the FoW as the imminent changes driven by shifts in the political, economic, social and technological environment, that will redefine what, how, where, when and by whom work will be done. These changes will affect the jobs available, the quality of jobs, wage and income inequality, social protection systems as well as social dialogues and industrial relations. The FoW is reflected in a new state of the workplace, workforce and jobs. This new state may be better or worse than the preceding state in terms of the social, political, technological or economic conditions.

While the FoW is influenced by forces such as climate change, globalization and demography (Balliester and Elsheikhi (2018), today, the discourse on the FoW is largely propelled by the unprecedented rate at which digital technology is disrupting business and society. In this regard there are two contrasting perspectives on the impact of technology on society, specifically on employment. One perspective emphasizes the threat of job losses, catalyzed by technological innovations such as automation, artificial intelligence, robotics and machine learning. Such innovations replicate human effort in job functions and threaten to displace workers with machines. Zervoudi (2020) reports that 47% of jobs in the United States (US) are at risk of automation, while in Europe, jobs at risk of

automation are estimated at between 45% and 60%. The World Economic Forum (2020) argues that while more than 2.6 million jobs were displaced as a result of automation between 2007 and 2018 in the US, there was also a rising demand for skills in non-routine analytical professions.

The alternative perspective relating to the relationship between technology advancements and the FoW argues that technology advances society by improving efficiency, boosting productivity, enhancing the standard of living and improving the quality of life. This view places emphasis on the opportunities associated with technological advancements, rather than the loss of jobs. Economic theorists have researched this phenomenon for years. The work of Romer, which earned him a Nobel prize in 2018, recognizes that economic growth and technological change drive each other Schilirò (2019). Romer's theories suggests that growth that is driven by technological change requires that there will be reconfiguration for new value to be created, and that the new state will be fundamentally different (Schiliro, 2019). This perspective does not overlook the job losses, but rather suggests that while jobs will be lost, new jobs will be created and there is a general inclination towards better overall economic outcomes. This view aligns with Karl Marx Compensation theory in Piva & Vivarelli (2018), which recognizes that jobs will be lost as a result of innovation but that the market will compensate for these losses. Compensation theory argues on the one hand, that the direct consequence of innovation is the loss of jobs. This occurs because the goal of innovation is to minimize the factors of production (mostly labor) involved in delivering a product or service. Contrarily, it also recognizes that there are economic forces which can compensate for the reduction in employment due to technological progress. Essentially, there are other economic advantages that will be achieved as a result of process improvement. These advantages can be derived in multiple ways, the most relevant to the FoW being as follows:

- Firstly, jobs are created in the areas where the new innovations emerge. Although compensation theory refers to jobs lost because of the introduction of new machines, it can also be relevant to the increase in jobs for information workers; secondly, compensation theory recognizes the efficiencies gained from mechanizing or automating processes. These efficiencies, according to Compensation Theory, result in cost reductions, which consequently lead to decreased prices, increased demand for goods and ultimately, increasing production and employment. Firstly, jobs are created in the areas where the new innovations emerge. Although compensation theory refers to jobs lost because of the introduction of new machines, it can also be relevant to the increase in jobs for information workers.
- Secondly, compensation theory recognizes the efficiencies gained from mechanizing or automating processes. These efficiencies, according to Compensation Theory, result in cost reductions, which consequently lead to decreased prices, increased demand for goods and ultimately, increasing production and employment.

Compensation Theory became the foundation of Say's Law in Piva and Vivarelli (2018, p.5) which theorized that "in a competitive world, the supply generates its own demand and technological change fully takes part in this self-adjusting process.". Schiliro, (2019) states that new value is created because of the reconfiguration that takes place and adds that the new socio-economic state is fundamentally different. This view is in line with Schumpeter's (1962) theory of creative destruction, which acknowledged the dichotomy between innovation and employment. History has shown that the economies at the forefront of industrialization have flourished, while those that failed to embrace a new paradigm brought about by technological advancements have trailed behind. Therefore, while job losses associated technological advancement are inevitable, the best way to mitigate the negative impact is to predict how best to reconfigure the workplace and workforce to meet the needs of the future state.

To date, literature on the Future of Work has focused on the jobs of the future, the socio-technological changes shaping the FoW as well as the impact of the FoW on the socio-economic conditions of society. Literature in the field is extant and disparate. Mitchell, Shen and Snell (2021) argue that research in the field is broad with few clear linkages or overall direction. Balliester and Esheikhi (2018) agree with this view, arguing that the FoW has many themes with no universal understanding of what it encompasses. Several authors have attempted to deconstruct the subject area by decomposing the concepts and themes. Frey and Osbourne (2017) for example, focused on job polarization issues by attempting to predict the relationships between the nature of work and the threat of job loss due to computerization. Their model predicts that transport, logistics, administrative and service occupations are highly susceptible to computerization and are at risk of job losses, while occupations that require creative and social intelligence are at the lowest risk. Frey and Osbourne's (2016) model is broad and makes assumptions based on the rate of automation of certain job types without considering the non-technology aspects of the FoW. For this paper, we draw on the model developed by Santana and Cobo (2020) which brings together the themes of the FoW over the last six decades and embraces both non-technology and technology aspects.

Santana and Cobo (2020, p. 846) aimed to "systematize and provide a structure for research into the FoW". They conducted an analysis of key themes across literature over a time span of 60 years and identified key concepts which they classified as political, technological, economic or social. They also used a strategic diagram composed of a classification matrix with axes measuring the density and centrality of literature in each theme to determine its relevance. Themes with a high density of supporting literature and a high centrality (a measure of the level of interaction between a network with other network, that is, a reflection of the importance of the theme) were classified in the first quadrant as motor themes. Motor themes are defined as well developed and important themes. Themes that were characterized as having a low level of centrality, despite having a high density of literature were classified as specialized themes. Transversal themes were characterized as being high in centrality but low in density indicating that the themes are cross cutting multiple areas of interest. The last classification was basic or emerging themes, where both the density and centrality were low, indicating that either the theme is still emerging, or it is declining in interest. Their analysis was systematic and rigorous and allowed key themes to be identified and categorized according to their importance. Santana and Cobo's (2020) model provides a foundation to either drill further into specific subtopics or to operationalize the FoW as a whole.

Singh, Jha, Srivastava and Somarajan (2021) conducted a systematic literature review of the FoW and identified key themes in the research field. They applied the same matrix used by Santana and Cobo (2020) to classify the identified themes in terms of importance (centrality and density). They further expanded on those key themes to draw conclusions and directions for future research. Their study supported the view that while technological changes alter the nature of work, they also raise the standard of living of society by making organizations more productive and efficient. They argue that the HR function is critical in ensuring that the right knowledge and skills are acquired to drive the future work state. While Singh et al's. (2021) systematic literature review produced more specific recommendations on how to address the challenges associated with the FoW, Santana and Cobo (2020) revealed a very definitive set of themes surrounding the FoW. All the themes identified by Singh et al. (2021) were also present in Santana and Cobo's model. Therefore, this study applies Santana and Cobo's (2020) model to operationalize the FoW by creating a model for measuring their identified themes to better understand their influence on the future of jobs in specific sectors. Table 1 summarizes the key themes identified by Santana and Cobo (2020) and will form the basis of the FoW conceptual model. The model will then be used to develop a research instrument making use of each of the identified themes as one or more items in the instrument.

4 Discussion and Findings

The aim of Santana and Cobo's (2020) classification was to provide a framework to define and understand the FoW, specifically considering the extant literature in the field. This study aimed at operationalizing Santana and Cobo's (2020) bibliometric analysis on the FoW. The aim was to develop a conceptual model of the constructs that determine the FoW in any given occupation or sector, and to identify factors that can influence the outcomes for the future of jobs. A research instrument is developed to test the interrelationships between the identified constructs. Table 1. summarizes the themes and subthemes that were used to construct the conceptual model, based on Santana and Cobo's bibliometric model. Table 1. also lists the questions to be included in the research instrument and relates them to the emergent themes. The consequent conceptual model hypothesizes the relationships between the main constructs. Future research will involve applying the research instrument in an identified sector to validate the conceptual model. The aim of the instrument is to later test the relationships between the constructs for validation and refinement of the conceptual model. Table 1. is followed by a discussion on the key socio-political and socio-economic implications of technology advancement.

4.1 Socio-economic factors

Santana and Cobo (2020) identify three fundamental shifts that have changed the nature of work and have been influenced by advancements in digital technology; these include new forms of work, flexible working arrangements and telework. New forms of work include gig work, platform work, crowd work and on demand work (Cobo & Santana, 2020). Flexible working arrangements and telework refer to how the traditional boundaries of time and place have shifted through the introduction of new digital technologies. Flexibility and telework can also be seen as part of the common theme of 'new forms of work'. While Santana and Cobo (2020) mention that these shifts change the nature of work, they do not mention that the nature of work is also influenced by changes in the actual jobs. Although workers may be able to adapt to changes in the place, time and the contractual arrangements surrounding a job, their ability to adapt to the changes in the actual work that must be done is far more challenging. For example, during the Covid 19 pandemic, workers across the globe were forced to adapt to shifting forms of work. Adapting to changes in the actual work to be done may prove more challenging than adapting to new forms of work. Santana and Cobo (2020) argue that workers may face high levels of stress associated with the need to adapt to new technologies in the workplace and the need to develop new competencies to fulfill changing job functions. Burnout, lack of job satisfaction, poor work-life balance and precarious jobs are cited as consequences of new work forms and changes in occupational types. Cruz-Del Rosario and Rigg (2019) also allude to a shift in the balance of power between workers and employers, where workers operate from "gig to gig, accepting lower wages and volatile contracts with no prospects of financial security, job stability, or career progression". They argue that short term gigs displace permanent positions, resulting in a generation of "net slaves". Cruz Del Rozario and Rigg (2019) add that workers are expected to be on standby to compete in an economic environment that is constantly in flux. These social factors have economic implications. The nature of work affects the challenges and opportunities in the labor market. The changing nature of work results in job polarization (Santana & Cobo, 2020; Campa, 2019), that is, the demand for jobs of a specific nature will decline, while other categories of jobs will become more widely sought after, There is consensus that the demand for jobs that require human intelligence such as creativity, emotional intelligence and higher order thinking will be increasing in the years ahead (Santana & Cobo, 2020; Singh et al., 2020; Balliester & Elsheikhi, 2018; Frey & Osbourne, 2016). Similarly, occupations requiring manual labor have also been predicted to see an increase in demand (Santana & Cobo, 2020, Campa, 2019). Mid skill and mid income jobs have been observed to be most at threat (Campa, 2019). This hollowing out of jobs

amongst the middle class is a phenomenon that has been observed in past industrial revolutions (Campa, 2019). However, Frey and Osbourne (2016) predict that the emerging technological paradigm will witness displacement amongst low wage and low skill jobs. Santana and Cobo (2020) identify precarity as an important theme relating to the FoW. Precarity describes conditions of insecurity and uncertainty and often relates to the insecurity of income, jobs and working conditions.

4.2 Socio-political factors

There are many technology-induced threats facing workers today. Automation, digitization, autonomous systems and artificial intelligence have rendered many jobs redundant. The platform and gig economies have opened competition amongst workers, offering employers a greater advantage in bargaining wages and working conditions for workers. Advancements in data analytics have improved decision making, efficiency, business intelligence and performance in organizations, but also threaten the privacy and emotional wellbeing of users when used to monitor their data and performance (Silva, 2021). With the emergence of the platform economy, gig work, crowd work and other forms of informal working arrangements, workers face a higher threat of facing unfair labor practices, demanding greater intervention from labor institutions and government. Workers are also facing the threat of displacement by systems that can do their jobs more efficiently and effectively. Researchers agree that there are competencies that must be acquired by workers in order to adapt to the changing nature of work (Balliester & Elsheikhi, 2018; Santana & Cobo, 2020; Singh et al., 2021). Gruen (2017) states that educational policies need to be responsive to the dynamic needs of the job market and educational institutions need to focus on 21st century skills that will be relevant in today's job market. This calls for future skills that extend beyond knowledge acquisition, that will ensure that the workforce is adequately skilled for jobs that are changing and jobs that may not even exist yet.

Industrial relations involve the interactions and interrelationships between employees, employers, labor institutions and the state. Trade unions serve to mediate between policy makers, workers and employers to ensure that workers interests are protected. Visser (2019) recognizes the declining influence of trade unions over the recent decades. They observe that in developed countries, the density of union representation has been steadily declining. They also observed that union representation is notably higher in developing countries, and attribute this to the fact that most employees in developing countries do not have formal employee status. In the poorest countries, unions organize about 4 percent of formal workers, in contrast to the 6% in lower-middle income countries (Visser, 2019). This is supported by Visser's study (2019) which empirically tested the relationship between unionization and labor rights violations and found a significant negative relationship. They also discovered a positive association between union density and economic development. Addison (2020) adds that the diminishing influence of trade unions is a greater concern now because of rising inequality and the loss of the voice of the worker. Unfortunately, Silva (2021) argues that employee relations are an area that have also been disrupted in the new technological paradigm. The rise of platform labor has added complexity to the ability for organized labor institutions to protect workers' interests. Lowe (1998, p.236) describes three philosophical standpoints relating to the FoW, one which champions change, one which hold a pessimistic view of change, and one which "advocates policy responses to shape change in specific directions". While all these positions are valid and are not mutually exclusive, the latter is solution oriented and offers a response to an inescapable situation. As a result, there is a need for critical reflection on the role of public policy and interventions to mitigate the threats to workers' rights in a technologically disrupted workplace. Silva (2019) describes this age as a golden age of creative destruction arguing that there is a need for social and political commitments to redistribute productivity gains to consumers and innovative firms. There is also a need for educational reform to address the knowledge and skills gaps that may preclude the constructive participation of the next generation of workers in a dynamic

workforce Gruen (2017). Frey and Osbourne (2019) even recommend tax incentives to encourage mobility of technologically displaced workers.

4.3 The imperatives of Future of Work research

The literature review reveals several core interdependent imperatives of FoW research. Firstly, the discourse appears to be concerned with the welfare of workers and their need to be treated and remunerated fairly and to be satisfied within their jobs. Secondly, it emphasizes the impact of changes in the workplace on the socio-economic welfare of citizens as well as the effect on economic growth and development. Thirdly, it seeks to avert the insecurity and uncertainty associated with job precarity and technological displacement. Fourth, it recognizes the role of industrial relations in balancing the opportunities and challenges that may influence employment, affect the wellbeing of workers and support economic imperatives. It is also clear that the FoW is influenced by changes in the social, political and economic environments, while technology appears to be the main catalyst triggering changes in the social, political and economic environments. Finally, FoW research places emphasis on job susceptibility resulting from technology displacement. The FoW should ideally reflect a state in which technology driven changes can best be balanced through the social, economic and political conditions of a sector or country to enhance the wellbeing of workers, to promote equality in economic opportunities and to support socio-economic growth and development. Predicting and responding to the socio-economic and political impact of technology on the future of work may support stakeholders in mitigating the impact on jobs. The goal of FoW research should be to ensure that the right knowledge, skills and policy exist to enable workers to embrace technology to perform jobs that are relevant. It implies fully employing technology to make work more efficient, and to optimize the output of workers. The conceptual model is therefore grounded on these principles and is presented in Figure 1. as a conceptual model for the operationalization of the FoW for predicting job susceptibility.

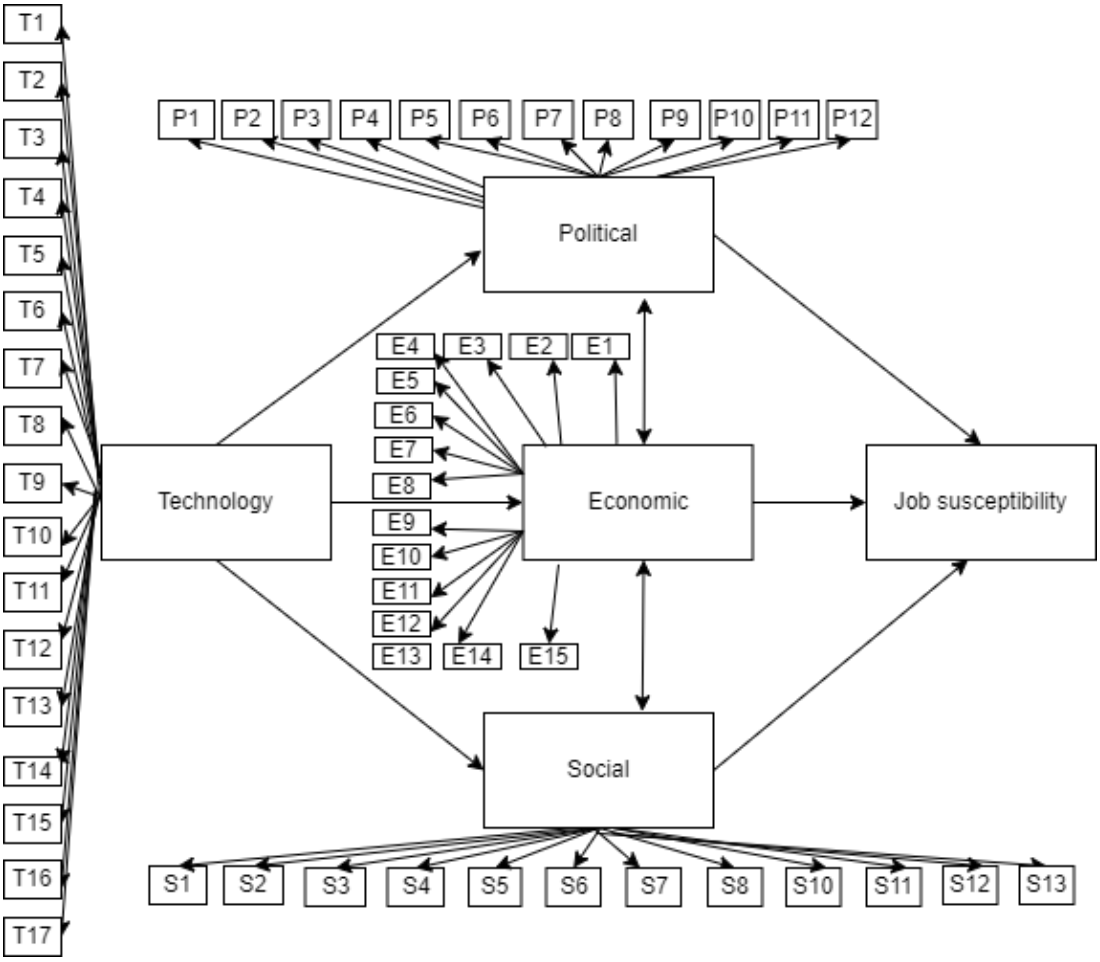

Figure 1: A conceptual model for measuring the Future or Work to predict job susceptibility

5 Conclusion

This study has defined the FoW, critically discussed the factors that influence the FoW, and identified a measure (job susceptibility) for the impact of FoW research. We have further developed an instrument to empirically assess a sector's susceptibility to job losses and determine ways to prevent or respond to the risk of job losses. Future work will involve conducting a factor analysis to validate and refine the instrument and thereafter, we will apply the instrument to a selection of industries to validate the conceptual model.

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