

Multi-level Resilience: A Human Capital Perspective

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1. Future resilience as a conceptual foundation

Resilience can be defined as “the capability and ability of an element to return to a stable state after a disruption” (Bhamra et al., 2011).

Resilience is a function of complex systems (Comfort et al., 2009; Fiksel, 2006) and can be applied at multiple levels, such as ecosystems (Bodin and Wiman, 2004; Brand, 2009), society (Allenby and Fink, 2005), communities (Norris, 2008), organizations (Barnett and Pratt, 2000; Starr et al., 2003) and individuals (Luthans et al., 2006; Powley, 2009).

As there is no existing definition yet about future resilience in relation to human capital and the way to measure it, we will explore related concepts to create our own Index of Human Capital Future Resilience. In this paper we will thus take into account socio-ecological resilience, organisational resilience and individual resilience, from a human capital perspective.

1.1 Socio-ecological resilience

According to the Stockholm Resilience Centre (Biggs et al., 2015), there are seven principles for building resilience in a socio-ecological system: maintain *diversity* and *redundancy*; manage *connectivity*; manage slow variables and *feedbacks*; foster complex *adaptive* systems thinking; encourage *learning*; broaden *participation*; and promote *polycentric* governance.

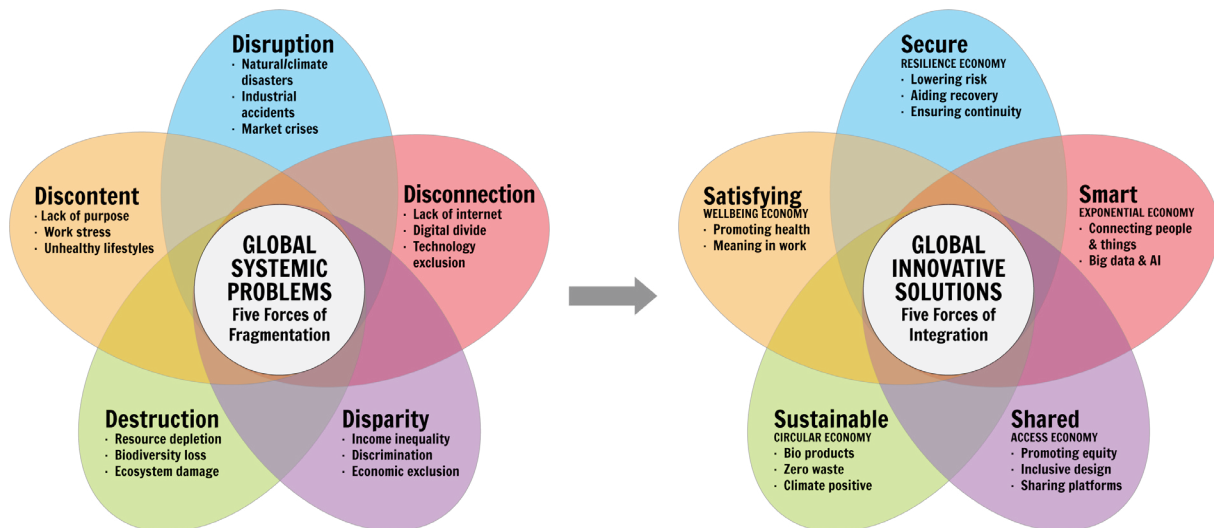
Fiksel (2003) identifies four major system characteristics that contribute to resilience. These include: *diversity* – the existence of multiple forms and behaviours; *efficiency* – performance with modest resource consumption; *adaptability* – flexibility to change in response to new pressures; and *cohesion* – existence of unifying relationships and linkages between system variables and elements.

Visser (2017) applies systems thinking (Laszlo, 2010; Capra and Luisi, 2016) to derive five forces of fragmentation or breakdown in socio-ecological systems (disruption, disconnection, disparity, destruction, discontent) and five counter-forces of integration or breakthrough that imply the capability for resilience (secure, smart, shared, sustainable, satisfying).

As summarized in Figure 1 below.

- In order to deal with *disruption* (e.g. natural/climate disasters, market crises, industrial accidents), resilience strategies include lowering risk, aiding recovery and ensuring continuity.
- For *disconnection* (e.g. digital divide, technological exclusion, human replacement by machines), resilience strategies include connecting people and things, using artificial intelligence or big data to benefit society.
- For *disparity* (e.g. income inequality, discrimination, economic exclusion), investing in diversity or equity, sharing platforms and inclusive design of products and workplaces will increase resilience.
- For *destruction* (e.g. resource depletion, biodiversity loss, ecosystem damage), increasing resilience requires the introduction of bio-products, zero waste design and climate positive strategies.
- And for *discontent* (e.g. lack of purpose, work stress, unhealthy lifestyles) calls for a focus on meaning in work, and ways to increase health and wellbeing.

Figure 1: Moving from systems breakdown to systems breakthrough



1.2 Organisational resilience

Vogus and Sutcliffe (2008) define resilience as the maintenance of positive adjustment under challenging conditions such that the organization emerges from those conditions strengthened and more resourceful. By 'challenging conditions' they include discrete errors, scandals, crises, and shocks, and disruptions of routines as well as ongoing risks (e.g. competition), stresses and strain.

In other words, enduring ongoing strain and recovering from discrete jolts implies the presence of latent resources that can be activated, combined and recombined in new situations as challenges arise. The ability to adapt in one period increases the probability of being able to do so in the next. Hence, resilience relies upon past learning and fosters future learning, drawing on a broad store of capabilities.

Resilient organizations often proactively seek out evidence to test their assumptions about risk and the overall health of the system (Weick and Sutcliffe, 2001). Consistent with welcoming news regarding the health of the organizational system and avoiding stale and narrow representations, resilient organizations encourage people to speak up regarding errors or conditions leading to errors.

Resilient organizations also hold onto the belief that they can readily cope with a wide array of anomalies and are constantly striving to grow their capabilities to do so. Resilience relies upon processes, structures and practices that promote competence, restore efficacy and encourage growth, endowing organizations with capabilities to mediate jolts and increased strain (Vogus and Sutcliffe, 2003).

Gallopín (2006) highlights the importance of vulnerability of a system, which is determined by sensitivity, exposure and capacity to respond – and where resilience and adaptive capacity are two components of the capacity to respond. Lengnick-Hall et al. (2011) found that a capacity for resilience is developed from a unique blend of organization-level cognitive, behavioral, and contextual capabilities and routines.

Cognitive capabilities include a sense of purpose and values; constructive sensemaking. *Behavioral* capabilities include practiced resourcefulness, counterintuitive agility, useful habits, and behavioral preparedness. And *contextual* capabilities include psychological safety, deep social capital, diffuse power and accountability, and broad resource networks.

Lee et al. (2013) see resilience as a multidimensional, sociotechnical phenomenon that addresses how people, as individuals or groups, manage uncertainty. Organizations respond to uncertainty in many ways: they centralize internal controls (Pfeffer, 1978); they learn (Carroll, 1998; Weick et al., 2005), they are creative (Kendra and Wachtendorf, 2003) and they adapt (Vogus and Sutcliffe, 2008).

Hollnagel et al. (2008) go further and identify a set of four abilities that they argue define the quality of resilience: the ability to *respond* to various disturbances and to regular and irregular threats; the ability to

flexibly *monitor* what is going on; the ability to *anticipate* disruptions; and the ability to *learn* from experience.

1.3 Individual resilience

According to Coutu (2002), resilient individuals possess three common characteristics: an *acceptance* of reality; a strong belief that life is *meaningful*; and the ability to *improvise*. These are echoed by Werner and Smith (2001), who identify four factors for individual resilience: problem solving abilities; favorable perceptions; positive reinforcement; and strong faith.

Youssef and Luthans (2007) find a positive correlation between resilience and job satisfaction, work happiness and organizational commitment. Schaufeli & Bakker (2004) also find a link with engagement in the workplace, where a lack of individual resilience may be associated with burnout and other health problems. One of the elements of engagement is vigor, which refers to high levels of energy and mental resilience while working, as well as the willingness to invest effort in one's work and to persist in the face of difficulties.

Rees et al. (2015) have found relationships between levels of individual resilience and specific negative outcomes such as burnout and compassion fatigue. They propose a model of individual workforce resilience which encompasses four different components: neuroticism, self-efficacy, mindfulness and coping. The starting point for the model is the basic proposition that an individual will at some point be exposed to workplace stressors (either acute or chronic).

- *Neuroticism* is the tendency to experience enduring negative emotional states such as anxiety, guilt, anger and depression more frequently, intensely and readily and for a more enduring period of time. It affects wellbeing and it is known from numerous studies that it is strongly related to negative outcomes such as stress and burnout (Rees et al., 2014).
- *Self-efficacy* is an individual's belief that he or she can perform a selected task (Bandura, 1977). Self-efficacy is multi-determined, in that it will be impacted by a person's past experiences, their spiritual beliefs their core beliefs and so forth. If a person believes that there is something they can do about a current stressor they will be more likely to engage in effective active coping strategies, such as seeking social support, problem-solving, and the use of cognitive-reappraisal.
- *Dispositional* mindfulness refers to a trait-like tendency to experience and express mindful qualities (e.g. non-judgment) and behavioral qualities (e.g. acting with awareness rather than automaticity). Low mindfulness is characterized by an inability to attain a de-centered perspective on events and a tendency to respond reactively and inflexibly to negative thoughts and emotions.
- *Coping* is a process of adjustment following an adverse event. In the workplace, positive reframing and support seeking coping is associated with greater job satisfaction and the use of avoidant coping with less job satisfaction (Welbourne et al., 2007).

1.4 Multi-level resilience

For the purpose of our applied research, we are interested in deriving and measuring multi-level future resilience, from a human capital perspective. Through the Human Capital Future Resilience Index, we want to encourage behaviors and capacities among employees that will increase resilience at the individual, organizational and socio-ecological levels.

Based on a review of the literature on these different levels of resilience, we have distilled the following 10 elements of future resilience, which the Randstad Future Resilience Index will seek to measure. Annex A shows the links to the literature and to Visser's systems breakdown/breakthrough framework.

- Emergency preparedness
- Creative adaptability
- Technological empowerment
- Dynamic employability
- Diversity cultivation
- Participative governance
- Systemic responsiveness
- Resource efficiency
- Purposeful motivation
- Wellbeing orientation

2. Human Capital Resilience Framework

In the following section we describe and discuss the ten derived elements of human capital future resilience, showing corroborating evidence from the literature review. Proposed survey questions are presented for each element. Table 2 at the end of the paper gives an overview or summary of the key references used to compose the ten human capital future resilience elements and the survey questions.

2.1 Emergency preparedness

A resilient organization – and by implication its employees – needs to be prepared for emergencies or crises. Emergencies can come in many forms, from conflict and natural disasters to volatile markets or industrial accidents. According to the Global Peace Index, only 10 countries in the world could be classified as conflict free in 2016 (Institute for Economics and Peace, 2016). Meanwhile, the impact of natural disasters on the labor market can be dramatic. In 2017, for example, it was reported that the US labor market lost 33,000 jobs during September, largely due to hurricanes Harvey and Irma (White, 2017).

Economic crises have a more direct and significant impact on the labour market. The economic crisis that began in 2008 caused a rapid rise of unemployment and a pronounced increase in the number of long-term unemployed. Of the workers who lost full-time jobs between 2007 and 2009, only about 50% were employed in January 2010 and only about 75% of those were later re-employed in full-time jobs (Nesvisky, 2015). Associated bankruptcies also generate severe stress and anxiety, resulting in maladaptive behavior and inappropriate decision-making at both individual and organisational levels (Wilson, 2016).

Organisations that can build the resiliency of their employees are more likely to protect their most valuable resources and maintain continuous operations in the event of a crisis (Okuwa et al., 2016). Business continuity is already a well-established field, but progressive companies are going beyond technical emergency response and business contingency planning and investing in preparing, strengthening and supporting their employees and other stakeholders (emotionally and psychologically, as well as physically) for dealing with disasters (IBM, 2018).

2.2 Creative adaptability

One of the most helpful capabilities in the face of disruption is the ability to adapt creatively. Coutu (2002) calls this 'ritualized ingenuity' and refers to the much-cited work of French anthropologist Claude Levi-Strauss's concept of 'skills bricolage' – 'a kind of inventiveness, an ability to improvise a solution to a problem without proper or obvious tools or materials' (52). Coutu concludes that 'resilience organizations are stuffed with bricoleurs' but warns that ingenuity is not a skill that comes naturally during crises, unless it is already a habit. She quotes renowned organizational psychologist Professor Karl E. Weick who says: 'What we do not expect under life-threatening pressure is creativity'.

Two related concepts that have been shown to be important in response to shocks or crises are emergence and improvisation. For instance, Kendra & Wachtendorf (2003) have found these were crucial in the way that responders to the September 11, 2001, disaster at the World Trade Center acted creatively to find solutions. Emergence in the context of disruption refers to ‘development of new relationships, new processes, or new ways of getting materials, often while simultaneously locating new constituencies’ (122). Improvisation, on the other hand, can be appreciated by thinking of jazz, which entails ‘composing in real time’, adapting and responding like a live conversation to whatever happened before or is currently happening.

2.3 Technological empowerment

There are two faces to the element of technological empowerment. On the one hand, digital connectivity can help to better anticipate and respond to disruption, whether that be market crises or natural disasters, like the US\$1 trillion per year of damage expected from flooding by 2050 (David, 2017). We have seen the positive role of technology, for example, during the Arab Spring, when protesters used Twitter and other social media to organize and adapt in the face of rapidly changing circumstances (including a state-police crackdown).

On the other hand, there is also technological disconnection on the labor market that affects employees, either because they are on the losing end of the digital divide (i.e. they are not yet well connected to digital resources), or because automation is threatening to replace their role (World Bank, 2017). A recent report by McKinsey shows that future job displacement will mainly be concentrated on low-skilled workers (Bughin et al., 2018), continuing a trend that has intensified in recent years. Therefore it is from great importance that employees are empowered to cope with the impact of technology on their job and organization.

2.4 Dynamic employability

Another challenge is that, as job roles become more nuanced and labour markets become more complex, finding the right fit between the skills on offer and the specifications of the jobs is becoming harder. For example, the time it took to fill a vacancy in 2016 was markedly higher than in 2005 (28 days versus 20 days) even though the unemployment rate in both years was comparable (Bughin et al., 2018). Increasingly, people will look for multiple ‘second curve’ work experiences, in which they reinvent their careers, leaping from one job path to another before it peaks and starts to decline (Handy, 2015).

Inevitably some job categories will be at risk of complete redundancy due to automation, but smart technologies will also create a new division of labor where workers increasingly perform tasks that complement machines (Autor, 2013). Hence, rather than full automation of workplaces or occupations on a large scale the labour market will need to adapt to changes in the workplace and employee tasks involved in certain occupations. As long as workers are able to adjust to these new demands, machines need not crowd out workers (Arntz et al., 2016). A culture of adaptability and lifelong learning will be crucial for spreading the benefits of AI and robotics widely through society, particularly with an ageing population where we need people to be able to work for longer (PWC, 2018).

2.5 Diversity cultivation

Cultural diversity has a positive effect on creativity and satisfaction (Shore, 2009) and a good diversity management policy in an organization has also a significant positive effect on performance of the organization and the individual employees (Turek, 2017). However, despite the growing attention around creating inclusive workplaces (Tolbert and Castilla, 2016), evidence suggests that in many organisations employees continue to be treated differently depending on their education, gender, age, ethnicity, sexuality or religion (Merluzzi and Sterling, 2016).

In order to be a resilient organization, there needs to be attention for diversity cultivation in the workplace. When diversity is managed in a good way and is anchored within the company culture, strategy and HR policy of the organization, it can lead to many positive effects both on the organizational level, team level and individual level (Van Beek & Van Doorne-Huiskes, 2011). There is also good evidence that diversity increases the resilience of a living system, as it is more likely to produce creative solutions to problems

(rather than suffer from ‘group think’) and is less dependent on narrow bands of capability or perspective (Fiksel, 2003).

2.6 Participative governance

An inclusive trend regarding resilience is the ‘shared’ principle, which is reflected in the trend of creating more inclusive organisational forms, ranging from cross-functional team-based work (Bughin, 2018) and employees as social innovators (Mirvis and Googins, 2018) to employee stock ownership plans (Kurland, 2018). One interesting example is holacracy, which online shoe and apparel retailer Zappos has experimented with. The idea is to replace hierarchy with self-organizing, self-managed teams that are guided by the organisation’s purpose rather than executive direction. Employees take on multiple roles, participating in teams that are organized around a purpose statement. As a result, Zappos should be more adaptable, innovative and resilient, with employees who are empowered to combine what they are good at, what they are passionate about and what adds value to the business (Bughin, 2018).

Another trend is the growth in shared models of production and consumption, which are referred to under various umbrella terms, such as the access-, collaborative-, crowd-, freelance-, gig-, on-demand-, peer-, platform- and sharing-economy (Rinne, 2017) is reflected in this trend. A global survey by PwC (2015) found that 72% of people expected to become a consumer in the sharing economy in the next two years and see major benefits, ranging from making life more affordable (86% agree), convenient and efficient (83%), good for community building (78%) and eco-friendly (76%). This has profound implications for how people will be working in future, with early indications that the sharing economy is widely distributed across age and household income categories.

2.7 Systemic responsiveness

Systemic responsiveness refers to an awareness of the wider socio-ecological system in which the economy, organizations and individuals are a part, and an ability to respond proactively to changes in this system. For instance, although it is often not recognized, many employees are already impacted by the deterioration in working conditions associated with environmental trends such as climate change and air pollution (Mooney, 2016). In terms of climate change, extreme weather events such as droughts, heat waves, heavy precipitation and the increased occurrence and intensity of cyclones or hurricanes cause job losses, forced short-term and long-term migration, declining working conditions and damage to assets and business continuity (ILO, 2017). The higher number of very hot days associated with climate change is also causing a ‘slowing down’ of work, which results in lower labor productivity (Kjellstrom et al., 2010).

Besides direct impacts on working conditions, environmental impacts will also affect economic viability in future, as companies are forced to pay the true environmental costs of their economic activities. These have been estimated at \$4.7 trillion a year (Fellow, 2013) and are projected to rise to \$28,6 trillion by 2050 (Trucost, 2010), roughly a third of current global GDP. These so-called ‘externalities’ include impacts like air pollution-related health costs, the effects of carbon emissions, the loss of nature-based benefits such as carbon storage by forests, and loss of natural resources. If businesses would take these externalities into account as a cost, none of the high-impact industries (like mining, oil and gas) would be profitable (Hance, 2013). Therefore it is also important that employees have a certain level of awareness of major economic, societal and environmental challenges.

2.8 Resource efficiency

Sustainability and resource efficiency have a significant impact on employees and the labour market. Most directly, 1.2 billion jobs rely on the effective management and sustainability of a healthy environment, in particular jobs in farming, fishing and forestry. These jobs are at risk if the resources and ecosystems on which they depend are not protected and restored. On the hand, tackling the challenges of the UN Sustainable Development Goals (SDGs) opens up \$12 trillion of market opportunities in the sectors of food and agriculture, cities, energy and materials, and health and wellbeing (BSDC, 2017). Hence, for example, growth areas like the circular economy that emphasizes the reuse, recycling, remanufacture and repair of goods will create around 6 million new employment opportunities (ILO, 2018).

There is also widespread evidence that more sustainable companies attract and retain more top talent (Whelan and Fink, 2016). Findings include improved morale (55% better according to one study), greater loyalty (38% better), increased productivity (16% more than unsustainable companies) and reduced turnover (by 25-50%). Furthermore, pride is higher and annual quit rates are 3-3.5% lower, saving replacement costs up to 90-200% of an employee's annual salary for each retained position. Therefore, encouraging resource efficient behavior among employees and organizations not only has workplace and labor market resiliency benefits, but also increases the resilience of the overall socio-ecological system on which the economy is wholly dependent.

2.9 Purposeful motivation

In the past decade, employee engagement has become an important indicator for HR leaders. Research suggests that 85% of workers globally are not engaged in their work, while in the U.S. only 14% strongly agree that the values of their employer match their own (Buck, 2018). In today's knowledge economy, where human capital often represents an organization's main asset – and source competitive advantage – these are concerning numbers and translate into significant risks and costs. Studies have found that decreased employee engagement leads to higher absenteeism, more errors, accidents and defects, lower productivity, lower profitability, lower job growth, and 65% lower share price over time (Buck, 2018).

The reasons given by employees for lower engagement is that they are feeling worn down by a combination of stress, boredom and 'aspiration deficit': the feeling that their work lacks a sense of deeper meaning or purpose that might compensate for the heavy demands placed on them. More recent research suggests that this is not an isolated phenomenon. In fact, around 50% of Americans report a lack of meaning and significance at work, which they believe is more important than feeling happy (Amortegui, 2014). From other research we also know that the purposefulness of a job in itself is important for engagement and seeing growth possibilities, and it has a great effect on intrinsic job motivation (Fried & Ferris, 1987).

2.10 Wellbeing orientation

As the line between work and non-work blurs, providing a robust suite of wellbeing programs focused on physical, mental, financial and spiritual health is becoming an organizational responsibility and a strategy to drive employee productivity, engagement and retention. These actions also impact the economy in a broader way. The corporate wellness market has grown to nearly \$8 billion in the United States alone and is expected to reach \$11.3 billion by 2021 (Deloitte, 2018). Comparison of work-life balance stress indicators in Europe between 2007 and 2016, for example, shows that work-life balance has deteriorated for all age groups and in particular for young women and women in the mid-age category (35–49) (Eurofound, 2017). The deterioration mostly took place after 2011.

When we look at work-related outcomes, we see two strong effects: burnout/exhaustion and work-related stress. Furthermore, it appears that an interference of work with private time is correlated with turnover, notably the intention to leave the job (Amstad et al., 2011). A final symptomatic area of discontent concerns the impact of lifestyle – and especially physical exercise, consumption patterns and dietary choices – on employee health. For example, research from Oxford University concludes that a failure to increase plant-based diets and reduce meat consumption by 2050 would result in between 5.1 and 8.1 million avoidable deaths and between 79 and 129 million years of life lost (Springmann et al., 2016). Progressive employers are responding with programs for financial wellness, mental health, improved diets, regular exercise, mindfulness, improved sleep, stress management and more (Craig, 2018).

3. Conclusion

This paper has demonstrated that future resilience is a highly relevant and useful concept for society, organisations and individuals in these rapidly changing times. Furthermore, it has shown that there is a sound theoretical and applied foundation for the proposed ten elements of the Human Capital Future Resilience Index.

Annex A: References supporting the Human Capital Future Resilience Index

Elements of breakdown/ breakthrough systems model (Visser, 2017)	Socio-ecological resilience	Organisational resilience	Individual resilience	Elements of human capital future resilience (derived)
	(1) Stockholm Resilience Centre, 2018; (2) Fiksel, 2003	(3) Coutu, 2002; (4) Lengnick-Hall et al., 2011; (5) Weick & Sutcliffe, 2001; (6) Hollnagel et al., 2008; (7) Vogus & Sutcliffe, 2008; (8) Vogus & Sutcliffe, 2003; (9) Weick et al., 2005; (10) Kendra & Wachtendorf, 2003	(3) Coutu, 2002; (11): Werner & Smith, 2001; (12) Schaufeli & Bakker, 2004; (13) Rees et al., 2015; (14) Turek, 2017	
Disruption > secure	Foster complex adaptive systems thinking (1) Adaptability (2)	Improvisation; being creative (3, 10) Learned resourcefulness (4, 6, 9) Counterintuitive agility (4) Useful habits (4) Behavioral preparedness (4) Adaptability (7)	Ability to improvise (3) Problem solving abilities (11) Self-efficacy (13)	1. Emergency preparedness 2. Creative adaptability
Disconnection > smart	Manage connectivity (1) Efficiency (2) Cohesion (2)	Broad resource networks (4)	Vigor (12)	3. Technological empowerment 4. Dynamic employability
Disparity > shared	Maintain diversity and redundancy (1) Broaden participation (1) Promote polycentric governance (1) Diversity (2)	Deep social capital (4) Diffused power and accountability (4) Broad resource networks (4) Promote competence (8)	Performance (14) Commitment (14)	5. Diversity cultivation 6. Participative governance
Destruction > sustainable	Manage slow variables and feedbacks (1) Efficiency (2)	Acceptance of reality (3, 6) Coping and anticipating capabilities (6, 7) Respond to threats, test assumptions (5, 6)	Acceptance of reality (3) Coping (13) Mindfulness (13)	7. Systemic responsiveness 8. Resource efficiency
Discontent > satisfying	Encourage learning (1) Cohesion (2)	Belief that life is meaningful (3) Sense of purpose & values (4) Constructive sensemaking (4) Psychological safety (4)	Belief that life is meaningful (3) Favorable perceptions (11) Positive reinforcement (11) Strong faith (11) Presence of job demands and job resources (12)	9. Purposeful motivation 10. Wellbeing orientation

Systems model	Elements of human capital future resilience	References
Disruption > secure	1. Emergency preparedness	Institute for Economics and Peace, 2016; White, 2017; Nesvisky, 2015; Wilson, 2016; Okuwa et al., 2016; IBM, 2018
	2. Creative adaptability	Bughin et al., 2018; Handy, 2015
Disconnection > smart	3. Technological empowerment	David, 2017; Worldbank 2017; Bughin et al., 2018
	4. Dynamic employability	Autor, 2013; Arntz et al., 2016; PWC, 2018
Disparity > shared	5. Diversity cultivation	Shore, 2009; Turek, 2017; Tolbert and Castilla, 2016; Merluzzi and Sterling, 2016; Van Beek & Van Doorne-Huiskes, 2011
	6. Participative governance	Bughin, 2018; Mirvis and Googins, 2018; Kurland, 2018; Rinne, 2017; PwC, 2015
Destruction > sustainable	7. Systemic responsiveness	ILO, 2017; Kjellstrom et al., 2010; Trucost, 2010; Hance, 2013
	8. Resource efficiency	BSDC, 2017; ILO, 2018; Whelan and Fink, 2016; Deloitte, 2018
Discontent > satisfying	9. Purposeful motivation	Buck, 2018; Amortegui, 2014; Fried & Ferris, 1987
	10. Wellbeing orientation	Deloitte, 2018; Eurofound, 2017; Amstad et al., 2011; Springmann et al., 2016

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