ORIGINAL ARTICLE

Competency Assessment for OR - COVID-19

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ARTICLE INFO

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ABSTRACT

Organizations are becoming more vulnerable to the external as well as internal challenges. Doing business becomes more cumbersome. One plausible remedy rests with the collective behavioural capacity of the organizations available to them in terms of their employees' behaviours and inner organizational systems that binds the organizational employees. Thus, samples were selected from the employees of the registered organizations of Malaysian Digital Economic Corporation Sdn. Bhd. (MDEC). A total of 252 samples responded to a survey-based instrument and the data were analysed with PLS-SEM to determine that the employees' collective behaviours capacities of commitment, communication, competency, community, connection, and coordination positively influenced the organizational resilience in MSC Status Companies. Employees are the most important resource for the organization to have a competitive advantage not only to lead but also instrumental in the survival of the organization (Tasic et al. 2019). A positive set of behavioural capitals exists inside the organisation enabling the organisation to thrive and survive by becoming an important agent for the growth of the national economy. The resilience as capacity is not the same for all organizations as it rests on the internal social system. This system enables the organisation to be resilient with the collective competency available to the organisation in terms of its people and system (Therese Sonnet 2016).

Keywords: Collective behaviours; resilience; organisation; COVID-19; Malaysia.

Introduction

The recent spike in the number of COVID-19 cases across the globe, led to the World Health Organization (WHO) in declaring the virus as a pandemic (Thomas-Rüddel et al. 2020). Many countries have institutionalised either complete or partial lockdowns. In the case of Malaysia, a restricted movement order has been in place since March 18th 2020 . Regardless of a partial of full-lockdown, most corporations across different industries, are focusing on business continuity, through work from home initiatives which require access to systems remotely and powered by high-speed internet connectivity. The impact of COVID-19 is compounded by the fact that many organizations have limited visibility into their risk exposure (Wang, Li, and Li 2020). This leaves employees, executives and stakeholders at risk and without comprehensive knowledge. This may require organisations to rethink competencies that are required to enhance resilience. Survival comes from the organization's capacity for resilience. Resilience permits the organization to get away with the difficult times and pass the times of the instability and adversity, to achieve the change and progress over the period of the time to survive. The organizational resilience is a capacity that organizations might take to understand their exposure and prepare for long term trends that can be effective against events like a coronavirus i.e. its workforce provides the necessary resources to pass the challenging

times to achieve a competitive advantage based on its people (Chaudhari, Nakhate, and Rautrao 2020).

It is important to realise that the recovery will not be static. It will not occur on a specific date. COVID-19 is unlikely to end suddenly given the lack of available therapeutics and the uncertain prospects and timing of a vaccine. Many organizations are therefore planning for multiple scenarios and time horizons as they shift from crisis response to recovery. Organizational resilience is the most important trait of the organizations with the increased competitiveness in the world. The organization with the least resilient capacities may not survive the next decade. Therefore, organizational resilience at the organisational level provides the necessary discussion to achieve and maintain the resilience. Policymaker can have the necessary input to achieve a resilient organization at the state or national level. Besides, a part of this study combines the divergent organizational methodologies of the system and network theories to approach organizational resilience based on the internal system and network exists between the people of the organisation to make the organisation a resilient one. Moreover, this study provides empirical support to enhance the understanding of organizational resilience as a capacity that can be measured and future enhancement very much possible as well.

Nearly 70% of Malaysian ICT based companies have continued their operation remotely due to COVID-19 (Department of Statistics Malaysia, April 9th, 2020). Galindo,2013 has proposed that behavioural awareness of employees towards organizational resilience (OR) requires investigation because societies have transformed and progressed because of advancements in ICT (Galindo and Batta 2013). Meanwhile, several scholars have claimed that disaster management and business continuity are imperative to establish an enhanced OR (Herrera and Janczewski, 2014). Nonetheless, information on the psychological effects of business continuity and organizational resilience (OR) from the behavioural and cognitive perspectives remains lacking. Therefore, in this study, we focus on the ICT sector, by taking a snapshot of the companies that are under the Multimedia Super Corridor (MSC) status, as companies that represent the ICT industry for the nation. The organizational resilience for MSC Status Companies is a new concept. However, it is important for the MSC Status Companies to be resilient as the large workforce gets employment from the MSC sector.

The Malaysian Digital Economic Corporation Sdn.Bhd. (MDEC), an agency in charge of MSC status companies, reported that while the adoption of technology during this pandemic is progressing, organisational resilience remains a priority issue. MDEC is also a platform nurturing the growth of local businesses, and to attract domestic direct investments (DDIs) and foreign direct investments (FDIs) from global multinational companies. The business continuity data space is projected to expand from 0.5 million sq. ft. to 5 million sq. ft. by 2020 (EPU 2017).

This paper focuses on core competencies that researchers suggest are vital to ensure organizational resilience. Many are also planning for the possibility of multiple waves of the pandemic and its continuing global uneven footprint. As a result, it is expected to a gradual transition from the respond phase to a new reality (Abdelhafiz et al. 2020). Organizations must prepare for different outcomes of the pandemic from mild, harsh, or severe and recognise that the recovery should adapt different situations within different countries and industries worldwide. Hence internal networks of enterprise occur in the shape of the internal process of the communication, community and competency that generates the necessary condition to have the commitment, connection and coordination, in a collective manner (Lengnick-Hall and Beck 2016). Therefore, it is important to identify the role of the internal dynamics of communication, community, competency, commitment, connection and coordination that enable an organization to achieve resilience in Malaysia. The aim of this study is to examine, if the collective competencies as listed above, play a vital role in determining the extent of organizational resilience in the context of a global pandemic.

Literature Review

The concept of resilience at the individual level is composed of individual's capacity to deal with the stress or an individual's ability to improve the resilience i.e. to work better under different stress situations (Mafabi, Munene, and Ahiauzu 2015). Based on the evolutionary theory of organizations, the role of threat conditions that move individuals, groups or organizations to avoid risks. It is natural to avoid risk or threats as well as to return to the normal position after facing a challenging situation. However, the organizational response to the threat and turbulent situations is part of their strategy based on the ideology of the organization (Annarelli, Battistella, and Nonino 2016). Organizational resilience is the capability to handle internal and external problems (Mallak and Yildiz 2016a). Some researchers defined organizational resilience as the competency to overcome problems (Annarelli and Nonino 2016). An important assumption in management is that employee's attitude and reactions to organizational change are closely associated (Rebeka and

Indradevi 2017). This theoretical paper tries to capture the attitude of employees' change in an organization. Competencies in overcoming problems in an organization is believed that both conceptualizations of the organizational resilience have similarities as both emphasizes on organization's survival and in dealing with challenging issues.

Resilience is often associated with the emergence of defencelessness and considered as the basis of triggering the protective behaviour or the risk factors where the perception of risk generates the perception of vulnerability and in turn triggers resilient behaviour (Mafabi et al. 2015). Perception of risk is highly associated with the personality dynamics of individuals (Connor and Davidson 2003). Each situation determines the activation of the resilience behaviours based on the adaptive capacity of the individual to address the risk factors that need attention to engage in the protective behaviours. Many times the individuals have fixed or neutral behaviours towards the risk factors as the individual views the situation as normal or demand no extraordinary action. That is the reason that the several resilience models based on vulnerability as the triggering point for resilience behaviour (Annarelli & Nonino, 2016).

Organizational Resilience
There are three main conceptualization streams for organizational resilience. Firstly, resilience is an innate feature of the organization, secondly, it is the outcome of the organizational activities for example, what the organization does and thirdly, the level of disturbance that can be tolerated by the organization (Annarelli and Nonino 2016). These three conceptualizations are broadly trying to grasp the notion of organizational resilience in three different ways. The resilience may be the capacity or the outcome of the activities of the organization to take on turbulent situations and survive. The resilience in dealing with known or unknown turbulent conditions is presently the most demanding organizational capacity faced by the organizations (Annarelli and Nonino 2016). Organizational resilience needs to be differentiated from the survival of the organization (Bhamra et al. 2015).

In this context, Malik defines resilience as "the developable capacity to rebound or bounce back from adversity, conflict, and failure or even positive events, progress, and increased responsibility" (Malik 2013). Therefore, organizational resilience is the ability of the organization to deal with the internal, external changes and risks. Few scholars termed organizational resilience as the capacity of the organization (Mallak and Yildiz 2016b) to learn from the environmental factors and gain the required resources that enable the organization to recover and bounce back to its normal position (Mafabi et al., 2015). The learning can be a single loop, double loop or multiple level learning (Arouri, Nguyen, and Youssef 2015). The organizational learning can be a viable option to explore organizational resilience (Annarelli & Nonino, 2016). The scholars called it as the capability of the organization to deal with the unforeseen (Horne III and Orr 1998). The ability, capacity, or capabilities have different meanings, but they describe the same thing. They refer to how the organizations can handle any crisis before it occurs, and aftermath learn from the mishaps. This process helps to develop resilience by withstanding the situations.

Manyena (2015) posit the the valuation of organizational resilience is multifaceted (Bhamra et al. 2015). Organizational resilience is the latent capacity of the organization (Powley, 2009). However, Gilly, 2014 termed organizational resilience as the active and reactive capacity of the organization (Gilly, Kechidi, and Talbot 2014). Nevertheless, organizational resilience is also considered as incremental and dynamic(Ruiz-Martin, Lopez-Paredes, and Wainer 2018) . Resilience is also the quality of the organization to meet the challenges of any change. Change can be in the form of an external stimulus or initiated by a change in the top management.

Based on the suggestion endorsed by McManus, Seville, Vargo and Brundson (2008) resilience is the combination of adaptive capacity, situational awareness and management of vulnerability at the organizational level (Phillips 2019). The adaptive capacity is the capacity of a system to change according to the changing environment. The organizations have internal and external factors that impact them and they need to adapt accordingly. To adapt well and remain resilient organization need to be well aware of these factors and their changing nature that may impact the organization. Furthermore, the resilience of an organization needs to have the internal capacity to manage and face crisis situations. At the enterprise level flexibility, adaptability, agility and efficiency are the attributes needed for enterprise resilience (Phillips 2019).

Lengnick-Hall (2016) posited three components mainly cognitive, behavioral and contextual for organizational resilience (Lengnick-Hall and Beck 2016). The cognitive component develops an ideological identity among the organization's employees. Another approach that can be employed is to base organizational resilience of having an ideological identity that is value-based resonated well with the value-based behaviours of the organizational community as well (Bhamra et al. 2015). The idea,

in this case, is for the organization to have resilience. An organization needs resilient employees along with internal systems that activate or trigger organizational resilience. Consequently, the behavioral capacities of the employees can act as the enabler for organizational resilience.

This leads to the behavioural resilience that required to be complex but based on the cognitive part (Manyena 2016). In short, the organizational routines and norms activate the functions that enable an organisation to have resilience (Lengnick-Hall and Beck 2016). The contextual component provides the means to integrate cognitive and behavioural resilience. The contextual resilience activates social capital or organizational level resource sharing network (Luthans and Youssef 2007).

Furthermore, the resilience of an organization is complex and is based on multiple internal and external factors that influence the resilience capacity of the organization. For instance, employees, suppliers, other market players, and policymakers (Gilly et al. 2014) and the existing system that operationally performs well inside the organization (Linnenluecke 2017). Moreover, endogeneity was not discussed in the literature as a prominent causality issue in the organizational resilience.

Assessment of the Organizational Resilience

The assessment of the organizational resilience is as complex as its definition. Wilson (2015) recommends gauging the organizational resilience on the seven attributes based on recommendations by Mallak (1998) on the conceptualization of organizational resilience for example, perceiving experiences constructively, performing with positive adaptive behaviours, the adequacy of external resources, expansion in decision-making boundaries, practice bricolage, tolerance for uncertainty and building virtual role systems(Wilson et al. 2015). Hamel and Valikangas (2010) proposed to estimate the organizational resilience on the ability of the organization to respond, monitor, anticipate and learn (Valikangas 2010a). Organizational resilience was measured with four factors for example, situation awareness, management of keystone vulnerabilities, quality and adaptive capacity (Whitman et al. 2013). Moreover, the awareness of forthcoming opportunities and crisis for the organization are important to become a resilient organization. Lee, Vargo and Seville (2013) suggest that evaluating the organizational resilience with the four factors and 73 items. Meanwhile, the Whitman et al. (2013) proposed the same four factors measured with 52 items as the shorter version of the Lee et al. (2013) scale based on two assumptions that the low rate of response

can be tackled and a better correlation between their scales (Lee, Vargo, and Seville 2013). Lee (2013) scales had the added features of innovation and creativity, collaboration and reporting compared to the scale of McManus(2008) (McManus et al. 2008; Lee et al. 2013).

Another approach was to base organizational resilience on system theory. The theory asserts that members of an organization are the actual resource and they form the capacity to achieve resilience in an organisation (Riolli & Savicki, 2003). The idea was to have resilience in the organization. An organisation needs resilient employees. The employees are the core assets of an organization. The organization's capacity responds to the shocks and risks that rest on the employees' capacities to respond to the challenges and threats. The mobilised and robust response can be achieved through collective efforts by the organization members. A social system is required to investigate the threats and challenging situations faced by the organization (Burnard & Bhamra, 2011). Therefore, the behavioural capacities of the organisation's employees can act as the enabler for organizational resilience (Annarelli & Nonino, 2016; Horne III & Orr, 1998). Moreover, the resilience of the organization does not rest totally on the organization's resources but the collaboration and joint efforts of its stakeholders including employees, supplier, other market player and policymakers (Linnenluecke 2017). This sense of resilient behaviour enhances when employees have a blend of cognitive, behavioural characteristics. In other words, the good or bad operations of an organization rest on the action of people and their respond to the internal and external challenges faced by the organization from time to time. This ability to react and counter in order to revert to the previous situation following the uncertain situation and circumstance is regarded as the concept behind a resilient organization.

Hypotheses Development

In this study, the organizational resilience is defined as the capacity of the organization based on the blend of cognitive, behavioural and contextual characteristics that trigger the readiness of the organization to achieve the resilience (Linnenluecke 2017). The idea in this research is, the organization's capacity resilience can be developed and managed, based on employees' efforts. These concepts are supported by the literature in human management. The lack of empirical work in this direction suggests that it needs more exploration with empirical work. This study also contributes to the collective behavioural model of organizational resilience. Organizational resilience is based on six components namely, vision,

values, elasticity, empowerment, coping and connections (Mallak, 1998). The work by Somers (2009) based on public organization was challenged by Mallak's framework. It showed that it was challenging to stand with individual and organizational resilience objectives. This was because the organizations' social systems centre on the dynamic and systemic interplay of the people and the structure of the organization. The organizational capacity that responds to the norm after facing a challenging condition is the notion of a resilient organization (Caralli et al. 2010). However, this capability to combat or bounce back is not associated with the challenges but for the enterprise to be ready with the right information to reduce the vulnerability in an effective manner (Annarelli and Nonino 2016). As this capacity is developed inside the organization with experience, a negative circumstance can move the organization to generate a positive effect (Chow and Ha 2009). This makes an organization resilient and provides a strong argument for collective sensemaking and working towards shared objectives with the collective capacities to achieve the organizational goals. This aggregation of the behaviours is also objectively mentioned by Lengnick-Hall et al. (2011).

Commitment within the Organization

The employees in an organization are the agents of the organizations (Allen & Meyer, 1990). Their actions represent organizational actions. It is well understood now that the committed employees are the biggest resource and capital for the organization. Commitment as a behaviour describes the employees working for the good of the organization and taking full responsibility to work for the betterment of the organization (Meyer and Maltin 2010). Committed employees are proud to be associated with the organization and they work for the betterment of the organization in every way (Bustinza et al. 2019). The sense of belonging to the organization is so great that committed employees take pains to solve problems for their organization with personal sacrifices (McManus et al., 2008). The collective perceived commitment portrays the general sense of motivation that prevails in the organization. This sense of commitment when prevails at the organizational level, it becomes the collective stance at the organization and enriches it to achieve resilience (Lengnick-Hall et al, 2011). Above discussion leads us to the hypotheses that

> Hypothesis 1 (H1): *The collective sense of commitment has a positive effect on organizational resilience.*

Communication within the Organisation

An organization as a social system needs to effectively exchange ideas and information through communication.

With accurate and authentic information, employees were well informed and had the knowledge to perform assigned tasks (McManus et al., 2008). Moreover, communication allows the necessary confidence for culture among the employees to support and encourage each other. In turn, open communication leads to building trust and preparing employees with a community feeling to face a crisis (Connor & Davidson, 2003). Organizational communication is a vital part of the culture as well as the prevailing norms of the organizations (Annarelli & Nonino, 2016). As effective communication relies on the effective working of the organization, the same is required to face adversity and to work amicably in difficult situations (Shittu, Parker, and Mock 2018). The organization that has a strong communication system enriches the employees' understanding in normal and crisis times, making it more resilient compared to the rest (Riolli and Savicki 2003).

> Hypothesis 2 (H2): *The collective perceived communication has a positive effect on organisational resilience.*

Community within the Organization

An organization is a community (Lee et al. 2013) and it works well when the community's perception is high among the fellow members in the organization. McManus et al. (2008) discussed the importance of the adaptability reflected by organizations as a response to the contingencies from inside as well as out. The community's feeling among the employees of organizations enables them to share the knowledge and support each other by sharing the information (Annarelli & Nonino, 2016). The flow of the information leads to the lessening of ambiguity among the organization's employees and they are able to perform the tasks efficiently. The people with a higher feeling of community put more efforts to resolve the organizational problems (Lee et al., 2013). Moreover, the employees with a high sense of teamwork, work together to handle the organizational disruptions to effectively come out of the crisis situation. We hypothesise that the

> Hypothesis 3 (H3): *The collective sense of community has a positive effect on organizational resilience.*

Competency within the Organisation

Employees bring their competencies to organizations and work well if they are given a direction to perform well for the organization. An organization essentially is the collection of collective competencies (Lengnick-Hall et al., 2011). An individual's capacity to foresee the issues in multiple angles enables him or her to have more clarity of the issue and resolve it immediately (Connor & Davidson, 2003). Furthermore, the competency to deal with crisis situations are taught within the organization. The community in the

organization with their competencies gets involved in improving job performance. Moreover, the people within organizations make every attempt to resolve the issues with their collective competencies (McGreavy 2013). This collective perception of competency when activated makes an organization a resilient one. We hypotheses that

> Hypothesis 4 (H4): *The collective sense of competence has a positive effect on organizational resilience.*

Connectedness within the Organization

Organizations are a network of relationships. Strong organizations are those that have high interrelationship within the organization at all levels of its structure while the weak organization has weak interrelationship among the people. This feeling of connectivity enhances organizational resilience (Nemeth et al. 2004). Although, the interconnection within the organization is important, the connection outside the organization with the industry's players is also important (McManus et al., 2008) as the crisis can originate from within as well as external. This interconnection leads to teamwork among employees. It has an external connection with the industry's players to make the organization more aware on the industry's situations that may impact the organization positively or negatively (Valikangas 2010b). This interconnectedness comes with collective consciousness for the entire industry's players to face the crisis situations that may impact all. Sharing of the information opens the avenue to share strategies among the industry's players to face the crisis (Sellberg et al. 2018). Therefore, this connectedness enables the organization to be more resilient. Therefore, we hypotheses that

> Hypothesis 5 (H5): *The collective sense of connectedness has a positive effect on organizational resilience.*

Coordination within the Organization

Organizations are a system that needs coordination among the people working within it. This coordination represents the structure that makes the organization a system that works well as a jointly coordinated organism (McManus 2008). The efforts within the organization need to be coordinated to have the feel of the organization; otherwise, it only becomes a collection of people having divergent objectives (Connor and Davidson 2003). The coordination within the organization enables the organization to work as a team to effectively accomplish the assigned tasks and analyze the vulnerabilities currently affecting the organization now as well that may impact in future (Wachs et al. 2015). Coordination is needed to divide the tasks between the employees in an effective manner and it is made possible by individual efforts (Lee et al. 2013). Moreover, the coordination

also makes it possible to prescribe the new ways to do the organizational tasks as well as foresee and prepare for the coming challenges that can impact the business as usual stance (Lee, Vargo, and Seville 2013b). The organization which has higher coordination with the employees becomes less vulnerable and more resilient.

> Hypothesis 6 (H6): *The collective sense of coordination has a positive effect on organizational resilience.*

Methodology

This study has a quantitative cross-sectional design to explore the relationship between organizational capacities and organizational resilience.

Sample Selection

The sample size for this study was estimated with the GPower version 3.1. Based on the power of 0.95 with the effect size of 0.15, the effective sample size required for this study was 153 with 6 predictors. However, as suggested by Chin (2010) the minimum sample size must be ten times of the path in the structural and measurement model (Chin and Dibbern 2010). Thus, the sample size for this study must be more than 150. Five hundred sets of the questionnaires were sent to 20 organizations registered with MDEC. A total of 292 questionnaires came back completed. The usable questionnaires were only 252.

Research instruments

The questions were designed to be simple and have balanced phrases that the respondents can easily understand and provide their own thoughts on the subject. Five items were utilized to gauge the community behaviour of organizational members and a sample statement was '*We as a team feel responsible to handle disruption for the organisation's effectiveness*'. The items were adapted from Lee et al. (2013). The work of Connor & Davidson (2003), provides the evidence to use collective competency as a resource that enables an organisation to be resilient. To estimate the collective competency of the employees, five statements were utilized and a sample statement was '*I resolve crisis competently at work*'. Another area is the connection perception within the community of the organization. The work of Connor and Davidson (2003) provide viable options. To assess the connection among the organizational employees, five statements were used and a sample statement was '*I am able to share my strategies with peers and partners to avoid adversity*'. Work of Allen and Meyer (1990) and

McManus et al. (2008) provides a rich understanding of the commitment that exists and supports the success of an organization. The perception of commitment of the organization's employees was estimated with five statements and a sample statement was '*I enjoy discussing my job and roles with other people to get better ideas* '.

Another important aspect of the organization is communication. The work of McManus et al. (2008) and Connor and Davidson (2003) highlights the importance of communication in the organization. The communication as the behaviour of the employee was estimated with five items and a sample item was '*I am informed and updated that I am able to disseminate more embedded knowledge to my work groups*'. The work of McManus et al. (2008) and Connor and Davidson (2003) discuss the status of coordination in the organization. For the estimation of the coordination, five statements were used and a sample statement was '*I am able to analyse and negotiate with staffs to handle situations efficiently during crisis*'. Organizational resilience is conceptualized with the definition by Wing and Wai (2009). The organizational resilience was evaluated with six statements and a sample statement was '*My organisation develops close and secure relationships to benefit from negative circumstances*'. Table 1 shows the content of Connor and Davidson resilience scale. Table 2 shows the items correlation and rotated factor pattern for the Connor and Davidson Resilience Scale.

Table 1. Content of Connor and Davidson Resilience Scale

Item No.	Description
1	Able to adapt to change
2	Close and secure relationships
3	Sometimes fate or God can help
4	Can deal with whatever comes
5	Past success gives confidence for new challenges
6	See the humorous side of things
7	Coping with stress strengths
8	Tend to bounce back after illness or hardship
9	Things happen for a reason
10	Best effort no matter what
11	You can achieve your goals
12	When things look hopeless, I don't give up
13	Know where you turn for help
14	Under pressure focus and think clearly
15	Prefer to take the lead in problem solving
16	Not easily discouraged by failure
17	Think of self as strong person
18	Make unpopular or difficult decisions
19	Can handle unpleasant feelings
20	Have to act on a hunch
21	Strong sense of purpose
22	In control of your life
23	I like challenges
24	You work to attain your goals
25	Pride in your achievements

Source (Connor and Davidson 2003)

Common Method Variance (CMV)

CMV is the measurement error that arises because of the specific method utilized in the study for the scale utilized, data collection techniques and analysis technique. The construct of the interest shares the common variance among the constructs of the study. The CMV was corrected by the procedural and statistical way as well. The scale utilized in this study was used so the statistical remedy was the best-suited. Harman's one-factor test was the test suggested by the Podasakoff, Mackenzie (2003), where one factor is extracted and expected to account for less than 40% of the variance explained by the first factor in the principal component analysis (Podsakoff et al. 2003). For this study, which were collected from one source, was inspected for common method bias utilising Harman's Single Factor Analysis in SPSS Table 3. CMV is the variance attributable to measurement method instead of the construct(s) supposedly represented by the measures. The total variance extracted showed that the extraction sums of squared loadings on the first factor was 27.166% i.e. less than 50.000%. As such, it was concluded that this dataset was free of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Multivariate Normality

The multivariate normality of the data was not required for the partial least square method.

However, as per the recommendation by Peng and Lai (2012) the multivariate normality of data was tested instead of making a general assumption about the data(Peng and Lai 2012). The study data multivariate normality was tested on the Web power online tool. The Mardia's multivariate skewness and kurtosis coefficient and p-values were calculated. The results highlights the data multivariate normality assumption rejects the resulting p-value less than the 0.05 and confirms that the data is non-normal (Cain, Zhang, and Yuan 2017).

Data Analysis Method

As this study is a quantitative approach and due to the non-normality of the data, this study utilized the PLS-SEM. The results of this study are reported as per the recommendations of Hair, Ringle and Sarstedt (2014) for

Table 2. Item total correlations and rotated factor pattern for the Connor and Davidson Resilience Scale

Item	Item Total Correlation	Factor				
		1 (7.436)	2 (1.563)	3(1.376)	4 (1.128)	5(1.073)
24	0.61	0.70870	0.14250	0.04339	0.19253	0.01779
12	0.62	0.63998	0.22255	0.20851	0.05018	0.11083
11	0.62	0.62497	0.11656	0.13206	0.21732	0.06408
25	0.56	0.60385	0.04385	0.14600	0.22531	0.11798
10	0.52	0.59601	0.17001	0.16642	-0.03336	0.10776
23	0.59	0.55800	0.32628	0.00758	0.12202	-0.04681
17	0.70	0.40381	0.35512	0.12714	0.35236	0.00409
16	0.62	0.39651	0.37804	0.26274	0.18958	0.03547
20	0.40	0.08774	0.67393	0.05234	-0.06238	0.23265
18	0.58	0.29395	0.57585	-0.01006	0.19034	0.08147
15	0.57	0.29967	0.53047	0.04440	0.23134	-0.01552
6	0.58	0.11507	0.52564	0.40443	0.12267	0.03711
7	0.55	0.14586	0.46703	0.30584	-0.01699	0.27429
19	0.64	0.17227	0.43428	0.27115	0.39728	-0.01199
14	0.64	0.25215	0.42942	0.26572	0.36228	-0.10734
1	0.55	0.07334	0.08512	0.75885	0.10762	0.03223
4	0.64	0.07074	0.19156	0.61921	0.40002	0.02811
5	0.69	0.26961	0.37932	0.55332	0.09561	0.08239
2	0.36	0.23482	-0.08203	0.53775	-0.14060	0.31552
8	0.67	0.34423	0.34073	0.43996	0.16462	0.04038
22	0.63	0.21396	0.12493	0.09219	0.77469	0.02935
13	0.62	0.15177	0.03725	0.20513	0.54772	0.40077
12	0.64	0.36495	0.15438	-0.02278	0.53186	0.32889
3	0.30	0.01386	0.01460	0.15972	0.15786	0.77820
9	0.40	0.12061	0.24612	-0.00029	0.05145	0.73662

Source (Connor and Davidson 2003)

the PLS-SEM. The recommendation for the indicators reliability at the item level is to have a standardized indicator loading of 0.70 and as for explorative studies the item loading is at 0.40 (Hair et al. 2014). The internal consistency was tested with Cronbach's alpha and composite reliability. The suggested values for both are 0.70 and above. The average variance extracted value must be 0.50 or above for each construct. The path coefficient represents the value of the effect of the input variable for the output relationship. The r^2 is the measure of the explanation of the outcome variables with the input variables. The effect size (f^2) and Q^2 are the measurements of the model. The model effect size (f^2) is the measure of the effect of each input variables on the outcome variable. Cohen's (1988) study provides the guidelines for the understanding of the (f^2). The effect sizes of 0.32, 0.15 and 0.02 presents the large, medium and small effect respectively. The Q^2 represents the predictive relevance of the model that how much is the accuracy of the input variables in predicting

the outcome variables. The Q^2 value of 0.02, 0.15 and 0.35 indicates the small, medium and large predictive relevancy of the model respectively (Haier et al., 2014).

Data Analysis

Descriptive Statistics

The 252 samples were taken from the enterprises registered with the MDEC, Malaysia. The respondents were largely male (56.3%). The statistics report from the Department of Statistics Malaysia showed that 77.8% of male employees were in the category of Senior Officers and Manager, while for female employees it was 22.2%. Next, in the category of professional and technical staff, male and female employees were 55.3% and 44.7%, respectively. This study proved through the survey conducted that male respondents were more than female respondents because men dominated the workforce.

Table 3: Harman's Single Factor Analysis Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**16.300**	**27.166**	**27.166**	**16.300**	**27.166**	**27.166**
2	5.014	8.357	35.523	5.014	8.357	35.523
3	4.247	7.078	42.601	4.247	7.078	42.601
4	3.510	5.850	48.451	3.510	5.850	48.451
5	2.809	4.681	53.132	2.809	4.681	53.132
6	2.129	3.549	56.681	2.129	3.549	56.681
7	1.670	2.783	59.465	1.670	2.783	59.465
8	1.559	2.599	62.064	1.559	2.599	62.064
9	1.489	2.482	64.545	1.489	2.482	64.545
10	1.090	1.817	66.362	1.090	1.817	66.362
11	1.019	1.698	68.061	1.019	1.698	68.061
12	.966	1.610	69.671			
13	.919	1.531	71.202			
14	.851	1.418	72.620			
15	.791	1.318	73.938			
16	.748	1.246	75.184			
17	.721	1.201	76.385			
18	.712	1.186	77.571			
19	.660	1.100	78.671			
20	.639	1.065	79.736			
21	.595	.992	80.728			

Table 4. Profile of the Respondents

	n	%		n	%
Gender			*Age*		
Male	142	56.3	Less than 30 years of age	61	24.2
Female	110	43.7	30-39 years of age	90	35.7
Total	252		40-49 years of age	76	30.1
			50-59 years of age	25	9.92
Education			60 years of age or above	0	
SPM	17	6.7	Total	252	
Diploma	45	17.9			
Degree	164	65.1	*Marital Status*		
Master	22	8.7	Single	173	68.6
Others	4	1.6	Married	73	28.9
Total	252		Divorced	3	1.19
			Separated	0	0
Working Experience			Widowed	3	1.19
1-5 years ago	72	28.5	Total	252	
5-10 years ago	95	37.6			
10-15 years ago	32	12.6	*Nationality*		
15-20 years ago	16	6.3	Malaysian	230	91.2
20-25 years ago	27	10.7	Non-Malaysian	22	8.7
Over 25 years ago	10	3.9	Total	252	
Total	252				

The respondents of 30 years of age or more made up of 85% of the total sample. On the other hand, population statistics from the Ministry of Human Resources (2017) revealed that the age group of 25–29 years was the highest while the second highest age group was 30–34 years. However, the samples were mostly single (68.6%). Most of the respondents are educated with a college degree (65.1%). The two big segments of respondents had 6-10 years of work experience (37.6) and 1-5 years of experience (28.5%). The rest had work experience of more than 10 years. The respondents were predominately Malaysians (91.2%). The report is shown in Figure 1. In addition, based on the Employment Statistics (2015), the category of employment with diploma and degree showed the highest increase, i.e. an annual average growth of 14.56%. Figure 5.1 shows demographic empowerment in Malaysia based on gender. Based on the results of the census, 72.65% of respondents were in the age group of 26–35 years. This age group consisted of millennials born between 1980–1996. They formed the highest percentage of employees because they were highly informed with the current development compared to baby boomers. Therefore, people from this age group joined the workforce with suitable education and knowledge. As such, in this research, the age group of 26–35 years registered the highest number of respondents who were employees attached in MSC status organizations.

They align with Malaysia's aspiration to become a competitive, developed, and high-income nation.

Validity and Reliability

As recommended by Hair (2013), the composite reliability must be 0.70 or greater for each construct (Hair, Ringle, and Sarstedt 2013). The results depicted in Table 5 show that the composite reliability for each construct was 0.860 or more. The Cronbach's alpha reports the inter-correlational estimate of the question items for each construct. The Cronbach's results show that 0.803 is the minimum value. The other constructs have values above than the prescribed limit of 0.70. Therefore, the Cronbach's alpha and CR values denote that the constructs are reliable. The average value extracted (AVE) for all items in each construct need to be more than 0.50 score to establish the convergent validity to demonstrate the uni-dimensionality. It showed that the items had sufficient convergent validity. After re-examining the factor loadings values, those lower than 0.6 were deleted to raise AVE rating (Ringle, Sarstedt, and Hair 2013). Items highlighted in red, as shown in Table 6, had low ratings (i.e. below 0.6). Thus, removed from the scale (Ringle et al. 2013). Then, the new factor loading (FL) ratings were determined in Table 6A after PLS algorithms were run for the model.

Findings of the study – Demographic

Demographic data collected		Statistics report from the Department of Statistic	
		Senior Officers & Manager	
Male	**56.3%**	Male	**77.8%**
Female	43.7%	Female	22.2%.
		Professional & Technical staff	
		Male	**55.3%**
		Female	44.7%

Statistics (Ministry of Human Resources)		Respondents age group	
Age Group	Q4 -2018 '000)	Age Group	% of respondents
25–29	**3302**	26–35 years.	**72.65%**
30–34	**2886.9**		

Figure 1: Demographic Empowerment In Malaysia (Source: Department of Statistics Malaysia)

Table 5. Reliability analysis

Variables	Number of Items	Mean	SD	Cronbach's Alpha	Composite reliability	AVE	VIF
CMM	5	4.257	1.06	0.916	0.937	0.749	2.001
COM	5	4.287	0.99	0.839	0.885	0.608	0.783
CIT	5	4.057	1.07	0.852	0.893	0.627	2.324
CMP	5	4.085	1.21	0.803	0.860	0.552	2.209
CON	5	4.228	1.13	0.854	0.950	0.631	0.296
COD	5	4.142	1.04	0.854	0.902	0.698	1.638
ORE	10	4.47	0.99	0.826	0.874	0.536	-

Note: CMM: Commitment; COM: Communication; CIT: Community; CMP: Competency; CON: Connection; COD: Coordination; ORE: Organisational Resilience; AVE: Average Variance extracted

To test the discriminant validity, the loading for each item and cross-loading need to be checked (Table 6c). The results showed that the item loads on their respective variables and fulfilled the assumption of the discriminant validity. The results are shown in the annexure. Another test for the discriminant validity is to check for the Fornell-Larcker criterion (shown in Table 6d). The results are shown in the annexure and the values are in an acceptable range. Another suggested test for discriminant validity is the HTMT ratio (as shown in Table 6e). The HTMT values must be at 0.90 or less to proof that the study has discriminant validity. The results depicted in the annexure showed that the study had no evidence of the lack of discriminant validity.

Path Analysis

The adjusted r^2 value for the model indicated that the 21.8 percent in the organizational resilience was explained by the organizational communication, community, commitment, competency, connection and coordination that existed and was perceived by the organizations' employees. The predictive relevance (Q^2) value for the model was 0.106 indicating a small predictive relevance of the six hypotheses on the organizational resilience among the sample from the Malaysian MSC registered with the MDEC.

The standardized path coefficients, t-values and significance level are presented in Table 3. The path coefficient for the organizational commitment on organizational resilience was ($\beta = -0.065$, $p = 0.156$), which does not support the H1. The results showed that the effect of the organizational commitment on organizational resilience is negative and insignificant. The path of coefficient for organizational communication on organizational resilience was ($\beta = -0.066$, $p = 0.209$), indicating a negative and insignificant effect on the organizational communication on organizational resilience. The results showed that the H2 was not supported. The path coefficient for

Table 6a: Factor Loadings (Before Removal)

Item	Loading	Item	Loading
CMM1	0.772	**ORE1**	**0.653**
CMM2	0.817	ORE2	0.723
CMM3	0.777	ORE3	**0.652**
CMM4	0.763	ORE4	**0.681**
CMM5	0.832	ORE5	0.734
COM1	0.866	ORE6	**0.656**
COM2	0.827	ORE7	**0.635**
COM3	0.865	ORE8	0.723
COM4	0.877	ORE9	0.747
COM5	0.893	ORE10	**0.663**
CIT1	0.827		
CIT2	0.786		
CIT3	0.843		
CIT4	0.741		
CIT5	0.770		
CMP1	**0.673**		
CMP2	0.822		
CMP3	0.848		
CMP4	0.765		
CMP5	0.787		
CON1	0.814		
CON2	0.791		
CON3	0.840		
CON4	0.877		
CON5	0.894		
COD1	0.713		
COD2	0.843		
COD3	0.857		
COD4	0.853		
COD5	0.753		

the organizational perception of community on organizational resilience was ($\beta = 0.367$, $p = 0.000$). Thus, the effect of the community's perception on organizational resilience was positive and significant and supports

Table 6b: Factor Loadings (After Removal)

Item	Loading	Item	Loading
CMM1	0.770		
CMM2	0.816		
CMM3	0.776		
CMM4	0.765		
CMM5	0.833		
COM1	0.866		
COM2	0.828		
COM3	0.864		
COM4	0.877		
COM5	0.893		
CIT1	0.825		
CIT2	0.786	ORE2	0.751
CIT3	0.844	ORE5	0.744
CIT4	0.741	ORE8	0.797
CIT5	0.772	ORE9	0.773
CMP2	0.822	ORE10	0.752
CMP3	0.848		
CMP4	0.765		
CMP5	0.787		
CON1	0.815		
CON2	0.789		
CON3	0.841		
CON4	0.877		
CON5	0.893		
COD1	0.713		
COD2	0.843		
COD3	0.857		
COD4	0.853		
COD5	0.753		

H3. The path coefficient for the organizational competency on the organizational resilience was (β = 0.122, *p* = 0.055), indicating positive effect of the competency on the organizational resilience and provided the evidence to support H4. The path of coefficient for the connection to the organizational resilience was (β = 0.117, *p* = 0.033), showing that the effect of the organizational connection's perception on the organizational resilience was positive and significant, and supported H5. The path coefficient for the coordination to the organizational resilience was (β = 0.226, *p* = 0.009), depicting the effect of the organizational coordination on the organizational resilience was positive and significant. It provided the evidence to support H6. Path coefficients results are shown in Table 7.

The bootstrapping analysis revealed that all four effects, namely community (t value = 5.072), competency (t = 1.601), connection (t = 1.844), (β = 0.117) and coordination (t = 2.410) were significant with t-values respectively. Nonetheless, for commitment and communication behavioural stream, the findings were t = 1.013 and t-value = 0.810, which was less than 1.645. Therefore, it can be concluded that there was no relationship between commitment, communication and organisation resilience.

Discussion

All MSC status companies are similar as they produce goods and services to drive the economy. However, they differ in their capacities to be resilient. The present study argues that resilience is due to the collective intrinsic resources available to the enterprise in the form of their people and the connections they build while working at the enterprise. Organizational disaster is due to high human error that has raised the question on the effectiveness of behavioural streams. This study has positive significance that employee behavioural streams played positive roles in supporting resilience in MSC status companies. Hence, the new resilience model developed in this research allows MSC status companies to further improve their organization resilience initiatives by giving employees directions on work processes that could reduce cognitive load which supports unique and complex situations.

This study was designed with six hypotheses: collective commitment, communication, community, competency, connection and organizational coordination to determine the effect of the organizational resilience among the MSC status companies, registered with the MDEC in Malaysia. The major issue addressed in this research was the role of employee behaviour that reduces human error in the workplace. It is an important issue as present statistics have revealed that human error is the major contributor of organizational disaster and failure, particularly in creating well balanced resilient employees, i.e. with the practice of clear task directions. Based on the seven behavioural streams (community, competency, connection, commitment, communication, coordination, and consideration) several recommendations are made to establish proper resilience at MSC status companies in Malaysia. The results were specifically developed with the aim of improving organizational resilience, a strategic pillar of Sendai Framework for Disaster Reduction. Disaster risk reduction's scope has been substantially extended to concentrate on both natural and man-made hazards. Sendai Framework's goal is to accomplish the numerous outcomes within 15 years.

Table 6c. Outer Loading and Cross Loadings

	CMM	COM	CIT	CMP	CON	COD	ORE
CMM1	*0.869*	0.323	0.396	0.547	0.159	0.146	0.223
CMM2	*0.821*	0.472	0.491	0.598	0.177	0.209	0.230
CMM3	*0.873*	0.382	0.400	0.448	0.305	0.070	0.288
CMM4	*0.878*	0.495	0.457	0.483	0.291	-0.085	0.163
CMM5	*0.883*	0.463	0.683	0.575	0.349	0.102	0.386
COM1	0.458	*0.704*	0.326	0.285	0.222	0.148	0.347
COM2	0.541	*0.831*	0.357	0.443	0.266	0.055	0.334
COM3	0.470	*0.860*	0..16	0.401	0.231	-0.084	0.258
COM4	0.445	*0.711*	0.314	0.420	0.278	-0.063	0.291
COM5	0.531	*0.779*	0.548	0.320	0.305	0.079	0.430
CIT1	0.110	0.256	*0.784*	0.512	0.083	0.385	0.197
CIT2	0.230	0.210	*0.822*	0.547	0.119	0.436	0.232
CIT3	0.255	0.252	*0.757*	0.598	0.103	0.450	0.240
CIT4	0.226	0.212	*0.752*	0.448	-0.001	0.449	0.124
CIT5	0.220	0.214	*0.840*	0.483	0.036	0.429	0.219
CMP2	0.472	0.107	0.267	*0.795*	0.318	-0.030	0.185
CMP3	0.382	0.072	0.255	*0.724*	0.159	0.146	0.223
CMP4	0.495	0.009	0.226	*0.666*	0.177	0.209	0.230
CMP5	0.463	0.082	0.305	*0.795*	0.305	0.070	0.288
CON1	0.260	0.294	0.288	0.471	*0.829*	-0.085	0.163
CON2	0.317	0.407	0.108	0.524	*0.824*	0.102	0.386
CON3	0.220	0.498	0.022	0.453	*0.836*	0.148	0.347
CON4	0.255	0.465	-0.018	0.491	*0.752*	0.055	0.334
CON5	0.311	0.452	0.056	0.322	*0.724*	-0.084	0.258
COD1	0.168	0.192	0.342	0.297	0.204	0.724	0.185
COD2	0.067	0.178	0.177	0.237	0.179	*0.741*	0.127
COD3	0.017	0.090	0.323	0.246	-0.115	*0.840*	0.140
COD4	0.011	0.198	0.381	0.334	-0.183	*0.863*	0.169
COD5	-0.006	0.209	0.353	0.285	-0.210	*0.890*	0.160
ORE2	0.192	0.256	0.275	0.169	0.291	0.237	*0.814*
ORE5	0.102	0.210	0.267	0.063	0.149	0.144	*0.785*
ORE8	0.203	0.252	0.255	0.106	0.154	0.238	*0.678*
ORE9	0.239	0.212	0.226	0.108	0.150	0.061	*0.744*
ORE10	0.218	0.214	0.305	0.273	0.146	0.119	*0.777*

Table 6d: *Fornell-Larcker Criterion*

CMM	**0.865**						
COM	0.267	**0.780**					
CIT	0.620	0.434	**0.792**				
CMP	0.567	0.473	0.676	**0.743**			
CON	0.341	0.096	0.331	0.357	**0.794**		
COD	0.023	0.546	0.048	0.130	-0.218	**0.836**	
ORE	0.259	0.268	0.430	0.373	0.204	0.196	**0.732**

Table 6e: *Heterotrait-Monotrait Ratios*

CMM	—						
COM	0.302	—					
CIT	0.699	0.504	—				
CMP	0.664	0.551	0.778	—			
CON	0.390	0.118	0.389	0.420	—		
COD	0.057	0.652	0.150	0.219	0.259	—	
ORE	0.289	0.308	0.493	0.422	0.240	0.235	—

Note: CMM: Commitment; COM: Communication; CIT: Community; CMP: Competency; CON: Connection; COD: Coordination; ORE: Organisational Resilience; AVE: Average Variance extracted

Table 7. Hypothesis testing

Hypothesis		Coefficient	t-values	Sig.	f^2	Decision
H1	CMM ➔ ORE	−0.065	1.013	0.156	0.003	*Not supported*
H2	COM ➔ ORE	−0.066	0.810	0.209	0.003	*Not supported*
H3	CIT ➔ ORE	0.367	5.072	0.000	0.076	*Supported*
H4	CMP ➔ ORE	0.122	1.601	0.055	0.009	*Supported*
H5	CON ➔ ORE	0.117	1.844	0.033	0.014	*Supported*
H6	COD ➔ ORE	0.226	2.410	0.008	0.041	*Supported*

Note: CMM: Commitment; COM: Communication; CIT: Community; CMP: Competency; CON: Connection; COD: Coordination; ORE: Organisational Resilience; AVE: Average Variance extracted

To accomplish the projected outcomes, several goals must be considered:

1. To improve people-centred multi-hazard, multisectoral forecasting systems and design systems like that via a participatory activity and adapt them based on the requirements of users that support simple and low-cost hazard facilities (Irfan and Naeem 2020).

2. To tackle prevailing challenges and be ready for future ones by concentrating on monitoring, via technology and research and enhancing disaster preparedness, response, and recovery (Tasic et al. 2019).

3. To encourage mutual learning and trade of good practices and information via voluntary and self-initiated peer review amongst concerned employees, stakeholders, organizations, and government agencies (Therese Sonnet 2016) .

The first hypothesis was to evaluate the effect of the perception of collective commitment that prevails in the enterprise on enterprise resilience. The result was found to be negative and insignificant suggesting that the enterprise level commitment is not contributing to the enterprise resilience (Britt et al., 2016). This finding, one could argue is due to the possibility that during a crisis, priorities shift and hence the main focus is business continuity (Braun et al. 2017). Not everyone in the organization are necessarily critical for business continuity. During the COVID-19 experience, we find that organizations very quickly issues policies to classify staff as either being critical or otherwise, with the critical employees being asked to continue with work, while others are subject to movement control order (Irfan and Naeem 2020). Global efforts have been exerted to prevent the spreading of the disease through political decisions together with personal behaviours, which depend on awareness of the public. Therefore, during such a crisis employees knowledge, perceptions and attitude towards the COVID-19 disease lead to make sure that business continues (Abdelhafiz et al. 2020).

The second hypothesis was to check the effect of communication on enterprise resilience. Communication was found to have no positive effect on enterprise resilience as the result was negative and insignificant. This leads us to posit that communication has no capacity to influence enterprise resilience. In this context, we find that during a crisis situation, the form of communication changes from human-centred to technology-centred communication which could potentially dilute both the breadth and depth of social based communication(Tregidga, Milne, and Lehman 2012). In addition, we also observed from the COVID-19 experience that not everyone has a common access to Internet and technology infrastructure and this is further exuberated by employees who travelled back to their hometowns in rural areas (with poorly internet/communication access) (Lauridsen et al. 2016). As such, we argue that while one would expect communications to play a vital role in organizational resilience, this can only be achieved in the event of the establishment of proper policies (tested during normal time) that govern effective communication during a crisis situation (Lin et al. 2014).

The third hypotheses evaluate the effect of the collective community perception on enterprise resilience. The finding supports the claim that collective community perception has a positive and significant effect on enterprise resilience (Burnard and Bhamra 2011). The finding is in line with earlier studies that gauged the effect of the collective community perception on enterprise resilience (Lengnick-Hall, Beck, and Lengnick-Hall 2011). In this context we suggest that although collective commitment and communication may not be seamless during a pandemic, in general employees tend to perceive that organizations will do what is best to remain resilient.

The fourth hypotheses evaluate the effect of the collective competency perception on enterprise resilience. The finding supports the claim that collective community perception has a positive and significant effect on enterprise resilience. The finding is in line with the earlier studies that gauged the effect of the collective

community perception on enterprise resilience (Caralli et al. 2010). Here we argue that during a crisis situation, employees general feel that their respective competencies will be used by management to ensure organizational resilience.

The fifth hypotheses evaluate the effect of the collective connection perception on enterprise resilience. The finding supports the claim that collective community perception has a positive and significant effect on enterprise resilience. The finding is in line with earlier studies that evaluated the effect of the collective connection perception on enterprise resilience (Lengnick-Hall et al., 2011).

The sixth hypotheses evaluate the effect of the collective coordination perception on enterprise resilience. The finding supports the claim that collective community perception has a positive and significant effect on enterprise resilience (Kostyuchenko et al. 2020).

This study's results revealed that out of the six behavioural streams, four (community, competency, connection and coordination) had a positive relationship with organisation resilience. The t-statistics values for these six behavioural streams were above 1.645 with significance at 90% confidence level. Meanwhile, communication and commitment behavioural stream had no significant relationship with organisational resilience. The finding is in line with the earlier studies that gauged the effect of the collective coordination perception on enterprise resilience (Mallak 1998). This echoes our earlier findings in that when collective competencies are used effectively during a crisis situation, this would increase the overall level of collective coordination in the organization hence increasing resilience. The proposed new theoretical resilience model is illustrated in Figure 2. This framework consists of a new theory that considers the apparent role of employee behaviour and organisational resilience.

Even though the significance of organisational resilience is recognised by researchers, the underlying relationship of the concept is still ambiguous (Abdullah, Noor, & Ibrahim, 2013). Thus, this research intended to illuminate the issue by conceptualising the relationship among behavioural stream antecedents, hence, contributing towards a better theoretical comprehension (Annarelli & Nonino, 2016; Sutcliffe & Vogus, 2007). Next, this study also targeted to bring improvement to the socio-psychological theory by outlining employees' regressive behaviour in the social context, in terms of organisational resilience, i.e. contextual, behavioural, and cognitive. Not only that, this research intended to verify that

the six behavioural streams, namely, community, competency, connection, commitment, communication and coordination encourage resilience. Particularly, adaptive behaviour was found to be perfect in stimulating creativity to develop organisational resilience during this current difficult situation such as COVID-19 (Sonnet, 2016). Additionally, this research concentrated on factors related to resilience based on Horne and Orr's (1998) behavioural streams. The findings may help in increasing employees' perception and self-assurance in dealing with COVID-19 pandemic situation and strengthening resilience.

Conclusion

This study is a mindful effort to enhance understanding of organization resilience through building and testing new models (Tasic et al. 2019). By taking organizational resilience as the capacity stance , we connect the organizational collective perception of the people to the organizational resilience. The findings of the study confirm substantially that the collective perception of the organizational employee towards the organizational community, competency, connection, and coordination have a significant effect on the perception of organizational resilience. This study confirms that people's perception as a resource positively enhances organizational resilience .This study contributes to the theory to offer a collective perception framework combined by the divergent understandings of the organizational resilience to support the findings that how the collective perception framework helps to contribute to the organizational resilience if taken in full.

This study contributes to the existing efforts to explore and enhance the understanding of organizational resilience as a process that can be gauged and improved over the period of the time. The outcome of the study implies to the managers and the policymakers that the most important resource of an organization are the people. The positive synergy between the employees enables the organization to become resilient. Therefore, management needs to implement strategies to have a more resilient organization. Moreover, the policymaker needs to establish a benchmarking framework that social dialogue and social partners play in the control of the virus at the workplace and beyond, but also to avoid massive job losses in the short and medium term (Wang and Wang 2020). Joint responsibility is needed for dialogue to foster stability. A more resilient organization in a state or country enhances the well-being of the community as well as businesses working under normal conditions can sure of
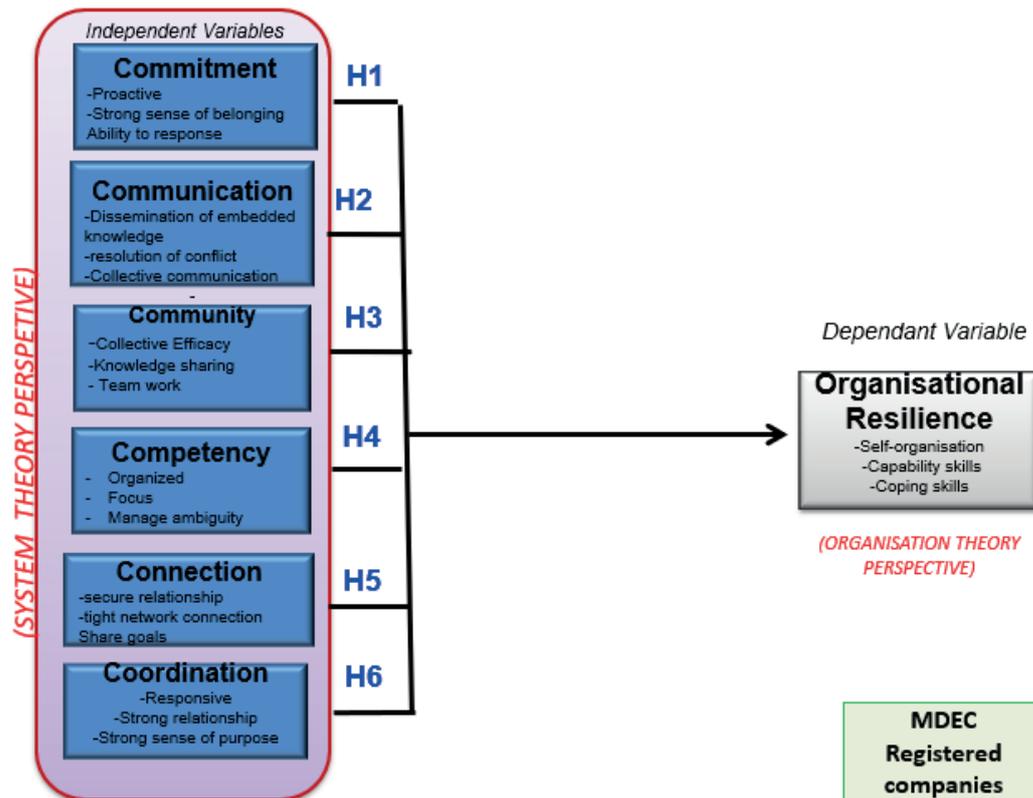
CONCEPTUAL FRAMEWORK

Figure 2: Organisation Resilience Framework

the provision of prosperity as well (Zautra, Arewasikporn, and Davis 2010). Addressing the immediate consequences of the crisis should be accompanied by a commitment to give priority attention in the longer term to protect and promote employment through sustainable enterprises to promote full respect for labour standards and decent work (Mollona et al. 2019). Workers and employers in organizations are actively engaged in mapping the impact of the crisis on their members, in order to better understand their concerns and needs, advise them during these critical moments, influence policy discussions related to the COVID-19 crisis, and reach bipartite and tripartite consensus, when possible (International Organization of Employers 2020).

One of the limitations in this study is the dimensions of the resilient origination such as role clarity, response mechanism or other structural factors could not be measured. Future research could extend the model by incorporating these factors to enhance the model contribution to have a greater resilience. It must explore in detail on how communication and commitment can make a positive impact on organisational resilience. Additionally, future research must explore the role of time on how resilience as capacity grows or falls with the organization in a given time period. This provides the opportunity for

management to start looking at resilience as a resource that needs to enhance over time.

Competing Interests Statement

The authors have declared that no competing interest exists.

Acknowledgements

The authors would like to thank Multimedia University, Asia Pacific University and all respondents who have contributed to the success of this study.

References

Abdelhafiz, Ahmed Samir, Zeinab Mohammed, Maha Emad Ibrahim, Hany H. Ziady, Mohamed Alorabi, Mohamed Ayyad, and Eman A. Sultan. 2020. "Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19)." *Journal of Community Health*.

Abdullah, Nurul Aisyah Sim, Nor Laila Md Noor, and Emma Nuraihan Mior Ibrahim. 2013. "Resilient Organization: Modelling the Capacity for Resilience." *International Conference on Research and Innovation in Information Systems, ICRIIS* 2013:319–24.

Annarelli, A., C. Battistella, and F. Nonino. 2016. "Product Service System: A Conceptual Framework from a Systematic Review." *Journal of Cleaner Production*.

Annarelli, Alessandro, and Fabio Nonino. 2016. "Gilbert et Al., 2012; Hamel and Valikangas, 2003." *Omega (United Kingdom)* 62:1–18.

Arouri, Mohamed, Cuong Nguyen, and Adel Ben Youssef. 2015. "Natural Disasters, Household Welfare, and Resilience: Evidence from Rural Vietnam." *World Development*.

Bhamra, Ran,Burnard, Kevin Dani.2015 .|" National Security as a Corporate Social Responsibility": *Critical Infrastructure Resilience.*

Braun, Thomas J., Bryan C. Hayes, Rachel L. Frautsch. DeMuth, and Olya A. Taran. 2017. "The Development, Validation, and Practical Application of an Employee Agility and Resilience Measure to Facilitate Organizational Change." *Industrial and Organizational Psychology*.

Britt, Thomas W., Winny Shen, Robert R. Sinclair, Matthew R. Grossman, and David M. Klieger. 2016. "How Much Do We Really Know About Employee Resilience?" *Industrial and Organizational Psychology*.

Burnard, Kevin, and Ran Bhamra. 2011. "Organisational Resilience: Development of a Conceptual Framework for Organisational Responses." *International Journal of Production Research*.

Bustinza, Oscar F., Ferran Vendrell-Herrero, MªNieves Perez-Arostegui, and Glenn Parry. 2019. "Technological Capabilities, Resilience Capabilities and Organizational Effectiveness." *International Journal of Human Resource Management*.

Cain, Meghan K., Zhiyong Zhang, and Ke Hai Yuan. 2017. "Univariate and Multivariate Skewness and Kurtosis for Measuring Nonnormality: Prevalence, Influence and Estimation." *Behavior Research Methods*.

Caralli, Richard A., Pamela D. Curtis, Julia H. Allen, David W. White, and Lisa R. Young. 2010. "Improving Operational Resilience Processes: The CERT® Resilience Management Model." in *Proceedings - SocialCom 2010: 2nd IEEE International Conference on Social Computing, PASSAT 2010: 2nd IEEE International Conference on Privacy, Security, Risk and Trust*.

Chaudhari, Chetan, Vidya Nakhate, and Revati Ramrao Rautrao. 2020. "Role of Hr Trends in Corona-Crisis Management and Organizational Sustainability Readiness." *International Journal of Advanced Science and Technology*.

Chin, Wynne W., and Jens Dibbern. 2010. "CH6 - Handbook of PLS." in *Handbook of Partial Least Squares*.

Chow, Wing S., and Wai On Ha. 2009. "Determinants of the Critical Success Factor of Disaster Recovery Planning for Information Systems." *Information Management and Computer Security*.

Connor, Kathryn M., and Jonathan R. T. Davidson. 2003. "Development of a New Resilience Scale: The Connor-Davidson Resilience Scale (CD-RISC)." *Depression and Anxiety* 18(2):76–82.

EPU. 2017. "Driving ICT in the Knowledge Economy." *Economic Planning Unit* 2011–17.

Galindo, Gina, and Rajan Batta. 2013. "Review of Recent Developments in OR/MS Research in Disaster Operations Management." *European Journal of Operational Research*.

Gilly, Jean Pierre, Med Kechidi, and Damien Talbot. 2014. "Resilience of Organisations and Territories: The Role of Pivot Firms." *European Management Journal*.

Hair, Joseph F. Jr., G. Tomas M. Hult, Christian Ringle, and Marko Sarstedt. 2014. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Vol. 46.

Hair, Joseph F., Christian M. Ringle, and Marko Sarstedt. 2013. "Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance." *Long Range Planning*.

Herrera, Andrea, and Lech Janczewski. 2014. "Issues in the Study of Organisational Resilience in Cloud Computing Environments." *Procedia Technology* 16:32–41.

Horne III, John F., and John E. Orr. 1998. "Assessing Behaviors That Create Resilient Organizations." *Employment Relations Today* 24(4):29–39.

International Organization of Employers. 2020. "Joint Statement on COVID-19 by International Organisation of Employers and International Trade Union Confederation."

Irfan, Muhammad, and Farooq Naeem. 2020. "Coping With Covid-19: Urgent Need for Building Resilience Through Cognitive Behaviour Therapy." *Khyber Medical University Journal* (March):10–13.

Kostyuchenko, Yuriy V., Viktor Pushkar, Olga Malysheva, and Maxim Yuschenko. 2020. "On the Behavior-Based Risk Communication Models in Crisis Management and Social Risks Minimization." *International Journal of Cyber Warfare and Terrorism*.

Lauridsen, Mads, István Z. Kovács, Preben Mogensen, Mads Sørensen, and Steffen Holst. 2016. "Coverage and Capacity Analysis of LTE-M and NB-IoT in a Rural Area." in *IEEE Vehicular Technology Conference*.

Lee, Amy V., John Vargo, and Erica Seville. 2013a. "Developing a Tool to Measure and Compare Organizations' Resilience." *Natural Hazards Review*.

Lee, Amy V., John Vargo, and Erica Seville. 2013b. "Developing a Tool to Measure and Compare Organizations' Resilience." *Natural Hazards Review* 14(1):29–41.

Lengnick-Hall, Cynthia A., and Tammy E. Beck. 2016. "Resilience Capacity and Strategic Agility: Prerequisites for Thriving in a Dynamic Environment." in *Resilience Engineering Perspectives: Preparation and Restoration*.

Lengnick-Hall, Cynthia A., Tammy E. Beck, and Mark L. Lengnick-Hall. 2011. "Developing a Capacity for Organizational

Resilience through Strategic Human Resource Management." *Human Resource Management Review*.

Lin, Che Wei, Shabbir Syed Abdul, Daniel L. Clinciu, Jeremiah Scholl, Xiangdong Jin, Haifei Lu, Steve S. Chen, Usman Iqbal, Maxwell J. Heineck, and Yu Chuan Li. 2014. "Empowering Village Doctors and Enhancing Rural Healthcare Using Cloud Computing in a Rural Area of Mainland China." *Computer Methods and Programs in Biomedicine*.

Linnenluecke, Martina K. 2017. "Linnenluecke, 2015." *International Journal of Management Reviews* 19(1):4–30.

Luthans, F., and Cm Youssef. 2007. "Emerging Positive Organizational Behavior." *Journal of Management* 33(3):321.

Mafabi, Samuel, John C. Munene, and Augustine Ahiauzu. 2015. "Creative Climate and Organisational Resilience: The Mediating Role of Innovation." *International Journal of Organizational Analysis*.

Malik, Akshay. 2013. "Efficacy, Hope, Optimism and Resilience at Workplace – Positive Organizational Behavior." *International Journal of Scientific and Research Publications*.

Mallak, L. A. 1998. "Measuring Resilience in Health Care Provider Organizations." *Health Manpower Management*.

Mallak, Larry A., and Mustafa Yildiz. 2016a. "Developing a Workplace Resilience Instrument." *Work*.

Mallak, Larry A., and Mustafa Yildiz. 2016b. "Developing a Workplace Resilience Instrument." *Work*.

Manyena, Bernard. 2016. "After Sendai: Is Africa Bouncing Back or Bouncing Forward from Disasters?" *International Journal of Disaster Risk Science*.

McGreavy, Bridie. 2013. "Communication and Resilience in Collaboration, Social-Ecological Systems, and Discourse."

McManus, Sonia. 2008. "Organisational Resilience in New Zealand."

McManus, Sonia, Erica Seville, John Vargo, and David Brunsdon. 2008. "Facilitated Process for Improving Organizational Resilience." *Natural Hazards Review*.

Meyer, John P., and Elyse R. Maltin. 2010. "Employee Commitment and Well-Being: A Critical Review, Theoretical Framework and Research Agenda." *Journal of Vocational Behavior*.

Mollona, Edoardo, Eirini Aivazidou, Vitaliano Barberio, Giovanni Cunico, and Luca Pareschi. 2019. "Policy Brief Policy Brief." (May):14.

Nemeth, Christopher P., Richard I. Cook, Michael O'Connor, and P. Allan Klock. 2004. "Using Cognitive Artifacts to Understand Distributed Cognition." *IEEE Transactions on Systems, Man, and Cybernetics Part A:Systems and Humans.*

Peng, David Xiaosong, and Fujun Lai. 2012. "Using Partial Least Squares in Operations Management Research: A Practical Guideline and Summary of Past Research." *Journal of Operations Management* 30(6):467–80.

Phillips, Jennie. 2019. *Building Resilience in Virtual Online Networks: A Case Study on Developing Resilience in Digital Response Networks (DRNS) through Networked Operational Resilience (NOR)*.

Podsakoff, Philip M., Scott B. MacKenzie, Jeong Yeon Lee, and Nathan P. Podsakoff. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of Applied Psychology*.

Rebeka, E., and R. Indradevi. 2017. "Employees Attitude towards Organizational Change." *Man in India*.

Ringle, Christian M., Marko Sarstedt, and Joseph F. Hair. 2013. "Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance." *Long Range Planning*.

Riolli, Laura, and Victor Savicki. 2003. "Information System Organizational Resilience." *Omega* 31(3):227–33.

Ruiz-Martin, Cristina, Adolfo Lopez-Paredes, and Gabriel Wainer. 2018. "What We Know and Do Not Know about Organizational Resilience." *International Journal of Production Management and Engineering* 6(1):11.

Sellberg, M. M., P. Ryan, S. T. Borgström, A. V. Norström, and G. D. Peterson. 2018. "From Resilience Thinking to Resilience Planning: Lessons from Practice." *Journal of Environmental Management*.

Shittu, Ekundayo, Geoffrey Parker, and Nancy Mock. 2018. "Improving Communication Resilience for Effective Disaster Relief Operations." *Environment Systems and Decisions*.

Sutcliffe, Kathleen M., and Timothy J. Vogus. 2007. "Organizational Resilience : Towards a Theory and Research Agenda Organizational Resilience : Towards a Theory and Research Agenda." *Conference Paper* 3418–22.

Tasic, Justyna, Sulfikar Amir, Jethro Tan, and Majeed Khader. 2019. "A Multilevel Framework to Enhance Organizational Resilience." *Journal of Risk Research*.

Therese Sonnet, MARIE. 2016. "Employees Behaviours,Belief and Collective Resilience." *Proquest* (10063554):146.

Thomas-Rüddel, D., J. Winning, P. Dickmann, D. Ouart, A. Kortgen, U. Janssens, and M. Bauer. 2020. "Coronavirus Disease 2019 (COVID-19): Update for Anesthesiologists and Intensivists March 2020." *Anaesthesist*.

Tregidga, Helen, Markus Milne, and Glen Lehman. 2012. "Analyzing the Quality, Meaning and Accountability of Organizational Reporting and Communication: Directions for Future Research." *Accounting Forum*.

Valikangas, Liisa. 2010a. *The Resilient Organization: How Adaptive Cultures Thrive Even When Strategy Fails*.

Valikangas, Liisa. 2010b. *The Resilient Organization: How Adaptive Cultures Thrive Even When Strategy Fails*.

Wachs, Priscila, Tarcisio Abreu Saurin, Angela Weber Righi, and Robert Lewis Wears. 2015. "Resilience Skills as

Emergent Phenomena: A Study of Emergency Departments in Brazil and the United States." *Applied Ergonomics* 56(March):227–37.

Wang, Jia, and Zhifeng Wang. 2020. "Strengths, Weaknesses, Opportunities and Threats (Swot) Analysis of China's Prevention and Control Strategy for the Covid-19 Epidemic." *International Journal of Environmental Research and Public Health*.

Wang, Lin, Jianping Li, and Chao Li. 2020. "Modeling Human Behaviors in Project Management: Insights from the Literature Review." in *Behavioral Operational Research*.

Whitman, Zach R., Hlekiwe Kachali, Derek Roger, John Vargo, and Erica Seville. 2013. "Short form Version of the Benchmark Resilience Tool (BRT53)." *Measuring Business Excellence*.

Wilson, F. M., Rashid, Romain Allais, Lionel Roucoules. 2015. "Organizational Culture: A Dynamic Model." *Journal of Cleaner Product*

Zautra, Alex J., Anne Arewasikporn, and Mary C. Davis. 2010. "Resilience: Promoting Well-Being through Recovery, Sustainability, and Growth." *Research in Human Development*.

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