Development of employees' resilience in technologically turbulent environments: probing the mechanisms of consonance–dissonance and crisis leadership

Abstract

Because of the digital revolution and the rapid change in technology, organizations have urged to engage in service innovation. With this in mind and drawing from cognitive dissonance theory, this study examines the relationship between technological turbulence and service innovation by considering the underlying mechanisms of openness and resistance to change. In addition, we propose that the mediating role of employee's openness and resistance to change will be moderated by crisis leadership efficacy. Building on multi-source data and two phases data collection process, we found that employee's openness and resistance to change mediates the relationship between technological turbulence and service innovation. Furthermore, the findings reveal that crisis leadership efficacy strengthened the relationships (both direct and indirect, via openness and resistance to change) between technological turbulence and service innovation. Implications for theory and practice are discussed.

Keywords: Service innovation; technological turbulence; openness to change; resistance to change; crisis leader efficacy; hotels

Introduction

Due to the recent COVID-19 pandemic where all businesses and social activities are forced to lockdown, businesses, government, and educational institutions across the world are rapidly responding to the COVID-19 pandemic by implementing travel restrictions. Remote and virtual learning and work from home policies are recommended. To ensure the continuity of business during this crisis, these institutions must establish strong information technology and user-friendly communication tools that enable remote working and learning smoothly for their associates and clients. Technology turbulence has shifted the relationship between people and technology, in particular during the period of pandemic-induced social isolation and distance. Technological turbulence is defined as the degree of change associated with technologies in the industries, and it considers organizations' perception, response, and adaptation to such changes (Jaworski & Kohli, 1993). Moreover, the advancement of technology such as multi-functional video conferencing instruments, artificial intelligence (AI), and smart technologies have seen exponential growth in recent years which accommodated fast and easy to access to users who are working and learning from home. However, the complicated nature but an unforeseen and brisk change of technology also risen challenges to individuals and organizations that need to learn and adapt quickly to the technology world. In the service industry like tourism and hospitality, innovation depends on human factors, which is necessary to further scale up the service quality, market share, and customer satisfaction. Frequent change in technology has been shaping the operation and function of the tourism industry over the last decade. Technology has replaced traditional booking system by introducing a none-click hotel room and package tour booking, improves services, and tourist and guest experience.

Several studies noticed that the success of every organization is depending on their reaction and response to either challenge or embrace turbulent conditions or environments (Storey et al., 2016; Stouten, Rousseau, & De Cremer, 2018). This implies the ability to deal with technological turbulences is essential for every organization to survive and sustain their business, as well as they, need to innovate themselves to cope with the various technical uncertainties on their business. Innovation in this regard could make a difference and can be the reason why some hotels perform better on the market, and others may not. Even though technological change and the subsequent demand variation requires service innovation aligned with modifications, reorganization, and scrutinizing the surrounding business environments, little research has focused on understanding the effect of technological turbulence on employee's service innovation performance in the hospitality (Lee & Hyun, 2016; Senebto & Hon, 2020). Broadly speaking, innovation research in service perspective is limited compared to manufacturing setting (Campiranon & Scott, 2014; Sjödin et al., 2020). Previous studies highlighted the necessity of further research on the underlying mechanisms arise from employees and managers influence to manage service innovation in a turbulent situation (Divisekera & Nguyen, 2018; Hon & Lui, 2016). Service innovation necessitates considerable organizational and employees' efforts to initiate and engage in the generation and application of new ideas and alternative work processes (Divisekera & Nguyen, 2018; Ottenbacher & Harrington, 2007; Storey et al., 2016). Consequently, building on cognitive dissonance theory and dissonance-consonance perspectives (Festinger, 1957; Hinojosa et al., 2017), a research question is developed for this study: why some employees are consonant and positively respond to technological turbulence and why do others repel and respond negatively to such changes driven by dissonance cognition?

In addition, past studies have noticed that a leader-efficacy driven by experience, persuasion, or emotional activation has an impact on the surrounding environment and assists

to manage difficult situations, and crisis leader-efficacy and the subsequent motivation to lead in a crisis and turbulent situation could initiate and manage change. Nonetheless, there is a scarcity of research on the boundary conditions of a leader's efficacy in the relationship between technological turbulence and service innovation in the hospitality context (Qiu, Dooley, & Xie, 2020). Against this backdrop, this study examines the contingent effect of crisis leader-efficacy as a causal boundary condition to influence the mediating effect of employee's openness and resistance to change between technological turbulence and service innovation.

This study holds important contributions to the hospitality literature. First, drawing from dissonance-consonance perspectives, we provide a compressive outlook of situation-based responses and leadership factors on how tourism organizations respond to technological turbulence. With that new understanding, we can answer hospitality managers' questions about why and how employees in tourism organization intended for service innovation and others banish it. Second, by examining crisis leadership as a boundary condition for openness and resistance to change that is related with technological turbulence, this study contributes to a better understanding of the impact of technological turbulence and service innovation. At last, this study moves beyond the extant literature that mostly examined technological turbulence on the western developed countries setting (Alam, 2011). It is, therefore, our findings pave the way to fill literature gap concerning turbulence, crisis, and innovation in the hospitality literature.

Theory and Hypotheses development

Cognitive dissonance theory

Cognitive dissonance theory is originated from social psychology, which refers to how individuals deal with conflicting or discrepant situations. Since its introduction in late 1950 in social psychology literature, cognitive dissonance theory has been used to explain and predict

individuals and organizations cognitive and psychological nature of dissonance in the form of behavior, perception, intention, and attitudinal change and behavioral decision-making processes. Festinger (1957) is a pioneer scholar to develop cognitive dissonance theory, and he defined cognitions from the broader mental representations, which includes attitudes, beliefs, or knowledge of one's behavior. He explained the notion of dissonance by using mathematical formula: $M = D/ (D + C)$. In such formula, *M* represents the degree of dissonance experienced (e.g., the amount of discomfort), *D* represents the number of cognitions that are dissonant from a referent cognition, and *C* embodies the number of cognitions that are consonant with the same referent cognition. CDT suggests that individuals having proper intention and decision-making when they face two or more contradictory cognitions arise from an unpleasant feeling or state.

Cognitive dissonance theory has been applied in human behavior settings to examine how organizations execute in the changing environments. Although cognitive dissonance theory can help us better understand the psychological intention, it has been less developed and infrequently applied in the tourism literature (Kah & Lee, 2016; Juvan & Dolnicar, 2014).

The main spectrum of cognitive dissonance theory has relied on 'cognitive discrepancy', in which individuals attempt to reduce uncomfortable situations and environment driven by the degree of dissonance and discrepancy reduction while elevating suitable conditions when they become activated by the magnitude of consonance. For example, a person motivated by a negative affective or attitudinal state of dissonance could exhibit a higher likelihood of reducing dissonance by changing and adding new consonant cognitions, or by subtracting dissonant cognitions. Given such aspects of dissonance and consonance are the main pillar of cognitive dissonance theory and it theoretically distinct the main set of the theory, in which the higher the degree of the dissonance, the higher the pressure to reduce dissonance, while the higher the degree of the consonance, the higher the perception to enhance consonance. In such vein, although every organization must go along with technological

change, little is known about employees' dissonance-consonance and leadership process in dealing with technological turbulence. In this study, resistance to change represents dissonance that resulted in cognitive inhibition and focuses more on opposition and apathy. We argue that employee resistance to change to service innovation in a turbulent situation is sourced from dissonance, and that such cognition could inhibit the process of achieving service innovation. On the other hand, openness to change represents consonance caused by curiosity and aspiration to experience different working methods could promote service innovation under technologically turbulent situation. Based on this theoretical view, Figure 1 presents the mechanisms of employee's openness and resistance to change driven by dissonance-consonance and crisis leadership efficacy on the relationship between technological turbulence and service innovation.

Insert Figure 1 about here

The consonance process of openness to change

Though service innovation is deemed necessary to overcome customer's demand shift arise by the changing trends in technology, safeguarding service innovation is risky and somehow uncertain. According to service-dominant logic perspectives, service innovation requires the intention and effort of a service provider to design additional products or services or modify the existing service delivery mechanisms (Peltier, Dahl, & Swan, 2020; Michel, Vargo & Lusch, 2008). Theory of persons in situations stated that individuals' phenomenology to a situation is influenced by his/her readiness and psychological engagement to respond to situations. Grant and Ashford (2008) underline the impact of dispositional and other person-related factors on individuals' change-oriented behavior. Given the importance of an intention and readiness among members of an organization in fostering service innovation (Hon & Lui, 2016), employees' situation-based responses play a pivotal role in their intention and

willingness to engage in service innovation. Literature underscores openness and resistance to change could determine organization's intention and effort in dealing with internal and external environment (Amabile et al., 2004; Hon, Bloom, & Crant, 2014; Lundy & Morin, 2013; Park et al., 2014; Turgut & Neuhaus, 2020). Correspondingly, this study considered employee's openness and resistance to change are considered as a situation-based response, in which openness refers to a receptive and positive response to technological turbulence and service innovation, while resistance shows unwillingness and a tendency to deviate from progressive change and action in turn to such turbulence and innovative performance.

Building on cognitive dissonance theory, we propose that employee's openness to change mediates the positive relationship between technological turbulence and service innovation. Openness has conceptualized as a 'support for change' (Miller, Johnson, & Grau, 1994, p. 60), and it is perceived as a necessary condition to achieve organizational success and change. Openness to change reflects a positive reaction and response in pursuing innovative work procedures in at workplace. Supporting this position, previous studies noted that openness inspires progressive outlooks and activities to advance performance and productivity (Roper, Vahter, & Love, 2013; Jun & Park, 2014). Cognitive dissonance theory suggests that individuals tend to balance their cognition to cope with uncomfortable condition. Likewise, technological turbulence brings fast and unpredictable changes that could exacerbate the complex business environment. This implies that employees with higher openness predominately feature a positive attitude to experience divergent work environment, intended to search and adapt new situations, and thus reduces the impact of such turbulence on organizational productivity and performance. For example, openness to change accelerates using information and communication technologies, advanced multi-channel management, and customization of services in exploring novel mechanisms and manages the technological turbulence. Empirical research in management, organizational behavior, as well as in

hospitality posits that openness to change contributes to commitment, embrace diversity, and enable an organization's effort to achieve success even under difficult situations (Hon & Lui, 2016; Park et al., 2014; Luu, 2019; Tuan, 2020). According to cognitive dissonance theory, employee's openness to change driven by consonance cognition contribute to the success of organizational goals and they would positively react and respond to technological turbulence. Openness to change could open up employees' curiosity to experience challenges and learning new or alternative work approach using new technological tools and resources. Thus, we propose the following hypothesis:

Hypothesis 1: Employee openness to change mediates the relationship between technological turbulence and service innovation.

The dissonance process of resistance to change

While technological turbulences open up employees' state of mind to experience new work procedure and opportunities and enhance openness to experience new technological tools and resources, there is likelihood that employees with resistance to change may exhibit unreceptive attitude to such foreseen and unforeseen changes. In such vein, we assume that employee's resistance to change negatively mediates the relationship between technological turbulence and service innovation performance. Resistance arises from skepticism and opposition to flexibility as an impediment to new technology, market, and service innovation (Kumar & Raghavendran, 2015; Lundy & Morin, 2013; Turgut & Neuhaus, 2020). Resistance restrains progressive attitude and action that restricts adapting new work methods and procedures and is seen as an opposition to innovation is rooted from a complex set of human behavioral, emotions, attitude, and cognition-related factors (Oreg, 2006). Employee's resistance to change draws from individual psychological, situational, and dispositional aspects that bring negative reaction and opposition to change in an organization (Oreg, 2006; Moutousi, & May, 2018). Such negative responses demonstrate a reluctance to accept and cope with

turbulent situations, instead of individuals with higher resistance to change prefer to hold old habits and execute under their comfort zone.

Technological turbulence has been revealed to have unpredictable changes that require transformative attitude in order to minimize challenges arise by turbulent technological business environment, as well as to maximize the capability of using technology-led opportunities into practice. Nonetheless, resistance to change and the subsequent opposition towards the rapid variation of technology can impede the initiation and implementation of new technologies in the business. Cognitive dissonance theory states that individual's response to situations that do not accord with their usual belief or practices (Festinger, 1957; Hinojosa et al., 2017), and thus he or she may experience stressful condition and dissonance in time of facing unusual environments or new working procedure in an organization. For instance, hotel employees who previously had been using traditional or outdated booking systems may experience dissonance or tension when a new booking system or an updated booking software have put into practice. Hence, technological turbulence brings uncomfortable psychological discomfort upon employee's performance at workplace. Previous studies argued that resistance to change do not coincide with progressive and innovative work environment, which is resulted from higher magnitude of risk aversion and fear of adopting new environment (Heidenreich & Kraemer, 2016; Kumar & Raghavendran, 2015; Hon et al., 2014; Lundy & Morin, 2013). Consistently, literature in tourism and hospitality have noted that resistance to change influences organization's endeavor to achieve competitive edge in the market because of its higher opposition towards adapting and admitting new working procedures introduced in the tourism organization (Okumus & Hemmington, 1998). Thus, drawing cognitive dissonance theory, we propose that employee's resistance to change driven by dissonance cognition is negatively mediates the relationship between technological turbulence and innovative behavior.

Hypothesis 2: Employee's resistance to change mediates the relationship between technological turbulence and service innovation.

The moderating role of crisis-leader efficacy

Cognitive dissonance theory (Hinojosa et al., 2017) noted that challenging situations motivates individuals to reduce the magnitude of dissonance resulted from discrepant cognition by maximizing conditions and consonance cognition. An individual's consonant cognition takes a central position in tackling difficult environments. Most importantly, organization or leadership support enhances the receptive attitude and positive instances of employees. Therefore, we expect that the association between technological turbulence and service innovation is contingent on crisis leadership efficacy. Nonetheless, the extant literature about the boundary conditions of this link is limited, leaving it unknown regarding why or whether some employees are responsive to technological turbulence and willing to engage on alternative ways of doing, while some employees are not, form the crisis leadership's features. In this study, based on cognitive dissonance theory, we propose that crisis leadership efficacy as a boundary condition of the relationship between technological turbulence and service innovation.

The performance and productive capability of leaders in a turbulent business environment play a pivotal role in determining innovative responses to the turbulence. Hence, we assume that the indirect effect of their openness and resistance to change is moderated by the manager's efficacy in a turbulent context. Leader's efficacy in crisis refers to the intention and capability of leaders to examine information, readiness to change, and the surrounding changing trends (Hadley, Pittinsky, Sommer, & Zhu, 2011). Previous studies suggest that leader's efficacy could determine his or her followers' thought patterns, response, and reaction to situations, and coping mechanisms under uncertain and difficult situations (Avery & Park, 2016; Zhu & Akhtar, 2019). Literature in hospitality has noticed that a person's self-efficacy

driven by experience, persuasion, or emotional activation has an impact on his or her surrounding environment and influence the way to respond to difficult situations (Chen, Huang, & Hu, 2019; Qiu, Dooley, & Xie, 2020). Additionally, rapid technological change could pave the way for fast service delivery and opens up opportunities to provide alternative and effective services. For example, recent advances in information and technology have enabled numerous service innovations across the tourism and hospitality industry. Some of them are service robots, mobile room access, smart room service, remote room check-in and out. Therefore, we argue that employees executed in higher crisis leader efficacy may find technological turbulence's features and its new tools and resources as a mechanism to perform the existing service delivery process and to attain customer satisfaction. In supporting this thought, studies have argued that technological turbulence can be considered as a way to augment organizations performance and ability to go along with changes (Li, Bonn, & Ye, 2019; Ogbeibu et al., 2020), and such intentions are expected to be benefited from the leadership support in terms of enhancing their sense of devotion and resilience to cope with technological turbulence. Thus, we develop the following hypothesis.

Hypothesis 3a: crisis leader efficacy moderates the relationship between technological turbulence and service innovation; as such, the positive effect of technological turbulence will be strong when crisis leader efficacy is high.

Although service innovation is necessary to confront with foreseen and unforeseen changes, the complexity and unpredictable nature of change and fulfilling the prerequisites to attain service innovation are somehow arduous for organizations. Against this backdrop, employee's openness to change shows a compatible attitude to change the status-quo together with leadership and organizational support to uphold service innovation performance. According to cognitive dissonance theory, the amount of consonant cognition plus other encouraging factors like leader's efficacy has a positive effect on individuals' inclination to reduce the impact of challenges and uncertain events (Festinger, 1957; Hinojosa et al., 2017;

Müller, 2020). Readiness, competence, and receptive intention to respond to change are some of the main expected aspects of leadership under turbulent business environment (Mabey & Morrell, 2011). For instance, facilitating training, employing online reservation tools, service and market recovery strategies are sought for managers' efficacy as well as employee's openness to experience, learn, and adapt different working methods. With this in mind, we argued that employee's openness to change helps to accomplish service innovation in a technologically turbulent business environment through leadership support and efficacy. Draws from cognitive dissonance theory, we propose that crisis leader efficacy as a boundary condition that is likely to strengthen the mediating effect of openness to change on the relationship between technological turbulence and service innovation.

Hypothesis 3b: crisis leader efficacy moderates the indirect relationship, via openness to change between technological turbulence and service innovation; such that the strength of the positive mediated relationship will be strong when crisis leader efficacy is high.

On the other hand, we propose that crisis leader efficacy serves as a boundary condition on the indirect link (via resistance to change) between technological turbulence and service innovation. Although employee resistance to change is seen as an opposition to new and alternative work procedure, thinking, and action, we assume that the impact of crisis leadership could shape the negative impact of resistance to change on service innovation. A leader's belief and his or her efficacy could determine the likelihood of managing a turbulent environment in an organization and such leadership initiation could confront with cognitive barricades like resistance to change in an organization. Previous studies found that leaders who are ready to change the status quo are initiated to identify threats and include the employment of self-enhancement strategies such as mobility, social creativity, or social competition to mitigate resistance to change (Stouten, Rousseau, & De Cremer, 2018; Wegge, Jungbauer, & Shemla, 2019; Wooten, & James, 2008). Such leadership behavior enables to conduct environmental scanning, trend analysis, knowledge and information acquisition, and formulating strategies to

resolve and cope with turbulences. As stated by (Festinger, 1957), in the cognitive dissonance theory perspectives, the magnitude of consonant factors like leadership could pave the way to maneuver dissonance or discomfort to situations. Empirical findings in tourism and hospitality literature have suggested that the influence of leadership is critical in shaping organization's reaction and response to turbulent business environment and uncertainties (Pennington-Gray et al., 2011; Paraskevas & Quek, 2019). Thus, this study proposes the following hypothesis:

Hypothesis 3c: crisis leader efficacy moderates the indirect relationship, via employee resistance to change between technological turbulence and service innovation, such that the negative indirect relationship is weak when crisis leader-efficacy is high.

Methods

Sample and data collection procedure

Data were collected from employees and managers in the hospitality industry in Ethiopia. The choice of this context is vital and draws its importance because of the rapid growth of the hospitality industry together with technological change and the exceeding necessity of service innovation. Respondents were approached through personal and professional orientations. The sample selection was limited to full-time front line employees because of their crucial role in service and frequent customer interaction and being in a position to examine and scan the internal and external work environment. The whole questionnaire was translated from English to Amharic (an official language in Ethiopia) based on a back-translation procedure (Sperber, 2004). Then, two bilingual language experts were invited to check the translated version and to confirm the quality of the translation, the consistency of meanings, and the meaningfulness of sentences. Before proceeding to the main survey, a pilot study was conducted with 40 respondents composed of employees, managers, and experts. In addition, we interviewed 17 managers to check the content and face validity of the survey as well as issues related to the context of the study, clarity, readability, meaningfulness, and wording (Goodman, Meltzer, & Bailey, 1998). Several discussions were conducted with

informants including managers and employees. Informants in the pilot study confirmed the importance of focusing on front line hotel staffs and managers who are working 3 to 5-star hotels, as they are more engaged in customer interaction and marketing issues and due to their exposition to the technological turbulence (Morales Mediano & Ruiz-Alba, 2019). Besides, changes were made on the translated version mainly on the crisis leader efficacy and service innovation constructs.

The research team approached the human resource managers and distributed 398 and 126 questionnaires to employees and supervisors respectively. At first, we collected data about technological turbulence (the predictor variable), openness and resistance to change (the mediators), and demographic variables (i.e. age, gender, work experience, and tenure) from employees. Then after, data about service innovation and crisis leader efficacy were collected. We received 312 usable pair responses with a response rate of 78% (employees' survey) and 62% (managers' survey), after matching managers and employees' pair responses and removing records with unmatched supervisor-subordinate dyads. Data about employees' service innovation were collected from their immediate managers (supervisors). We used unique codes to correspond to the survey questionnaires collected from managers and employees. On average, the response rate is 1:4 ratio is that one supervisor rated three to four employees on their service innovation. Employees' demographic data exhibits that 51% of the respondents were female, and 35% were aged in between 18 to 25 years old, 42% were between 26 and 35, and the remaining were ranged between 36 to 45 and older than 47. Managers' demographic data exhibits that 54% of them are male and average age and work experience were 35 and 5.6 years, respectively. In terms of education, the majority of the respondents had a college, vocational, or university level education (55.7%), and the rest had either a postgraduate education or a secondary or high school level. SPSS version 25 Structural

equation modeling (SEM) with AMOS 25.0 was used to perform the descriptive statistics, correlation, confirmatory and structural model analyses.

Measures and control variables

A seven-point Likert scale ranges from 1 (strongly disagree) to 7 (strongly agree) was used to measure the constructs. The survey included technological turbulence, service innovation, crisis leader efficacy, employee's openness, and resistance to change. We measure technological turbulence based on Jaworski and Kohli's (1993) 4-items. Sample items are: "It is very difficult to forecast where the hotel technology used in our industry" and "I believe that our hotel can respond to technology-related uncertainties". The AVE and composite reliability were .62 and .81. Service innovation was measured by using 5-items developed by Grawe, Chen, and Daugherty (2009). Sample items included 'we can modify current service approaches to meet special requirements from customers' and 'we are intended to modify our current service approaches to meet special requirements from customers'. The composite reliability and AVE were .90 and .59. We used 8 items to measure crisis leader-efficacy originated from Hadley et al. (2011). Sample items were "Leaders in my organizations could make decisions and recommendations even under extreme time pressure", and "Leaders assist me to modify my regular work activities instantly to respond to an urgent need". The composite reliability and AVE were .81 and .64. Miller, Johnson, and Grau's (1994) 6-items were used to measure the extent of the employees' openness. Sample items were "I look forward to the changes in my role that are brought by the implementation of work teams" and "I perceive co-workers' achievements as a positive implication to accomplishing my task." The AVE and composite reliability of this scale were 0.67 and 0.91. Employee resistance to change was measured using Oreg's (2006) 15-items. Sample items were "I feel stressed having to follow new working methods and approaches" and "I presented my objections toward new ways of marketing strategies that I have to follow." Given the scales has three sub-categories such as

affective, behavioral, and cognitive resistance to change, we performed second-order confirmatory factor analysis. The fit indices for the three first-order factors and one second-order factor fell within an acceptable range (X^2 = 189.30, *df* = 112, *TLI* = .93, *CFI* = .95, and *RMSEA* = .41). The AVE and composite reliability of this scale were .56 and 0.93.

Control variables. Age, gender, experience, educational level, firm size, and tenure influences behavioral reactions about change, innovative and other behavioral intentions (Kusluvan et al., 2010). As supervisors rated employees' service innovation, we controlled for the employee-supervisor relationship (length of time that they had worked together). A dummy variable was utilized to control these demographic variables.

Results

Means and correlations

Table 1 presents the means, standard deviations, and correlations of all of the constructs. As expected, employee openness was positively related to technological turbulence (r = .34, p < .05) and service innovation (r = .29, p <.05), whereas resistance to change is negatively related to technological turbulence (r = -.25, p < .05) and service innovation (r = -.31, p < .05). Crisis leader efficacy was positively related to technological turbulence (r = .15, p < .05), service innovation (r = .15, p < .05). Before proceed to conduct confirmatory and factor analysis, assumption of collinearity was checked and the result noticed that the highest variance inflation factor (VIF) value for the variables was 1.4, and the tolerance values ranged between .73 and .86, and thus the data did not violate the multicollinearity concern (Hair et al., 2010).

Insert Table 1 about here

Measurement model

Confirmatory factor analysis was conducted to examine the measurement model composed of technological turbulence, openness to change, resistance to change (altogether

with its three sub-indicators such as affective, behavioral, and cognitive resistance to change), crisis leader efficacy, and service innovation. The factor loadings for all of the constructs, along with the second-order factors of employee resistance to change were higher than the cut-off point of 0.5 (Hair et al., 2009). Moreover, the t-values were above the threshold of 1.96 with a 95% confidence interval and that revealed both the limits and factors were significantly related. The measurement model result revealed that both the absolute and relative fit indices met the acceptable fit ranges (X^2 = 985.71; *df* = 763; *CFI* = .95; *GFI* = .90; *TLI* = .97; and *RMSEA* = .034).

Regarding construct validity i.e. convergent and discriminant validities, Table 2 shows that the proposed five-factor model met the acceptable threshold of the convergent validity, with average variances extracted (AVEs) greater than 0.5. This implies that there is an association between the measurement indicators in their respective constructs (Fornell & Larcker, 1981). The composite reliability of all the constructs was above 0.7, which indicates that the items consistently measured the respective constructs (Tavakol & Dennick, 2011). Statistical significance was met for all factors loadings sourced from confirmatory factor analysis results with $p < .01$ and this suggest that the reliability and validity of the constructs were fell under acceptable fit range. To check the discriminant validity, we compared the five-factor model with the one-factor model. However, the result showed the one-factor model demonstrated a poorer fit (X^2 = 8134, *df* = 935, *GFI* = .46, *CFI* = .53, *TLI* = .39, *RMSEA* = 0.26) and this result supported that the proposed model is a better fit than other alternative models. Moreover, as shown in Table 1 the proposed framework can support the proof for discriminant validity, by considering the result of the square root of AVE is above the construct correlations (Fornell & Larcker, 1981; Hair et al., 2010). The square root of AVEs values was higher than their respective inter-construct correlations.

Common method bias

Procedural and statistical techniques were pursued to examine common method bias issues (Podsakoff et al., 2003). Procedurally, our multi-source sampling and different phases of data collection processes could assist to mitigate biases related to social desirability and miscalculation of behavioral and self-judgmental aspects. In addition, it helps to alleviate endogeneity issues derives from subjective evaluations aligned with pre-determined responses (Ullah, Akhtar, & Zaefarian, 2018). Second, we ensured the confidentiality of all responses, checked for equivocal concepts, meanings, and interpretations. Statistically, Harman's single factor test was performed to examine common method bias and the result revealed that the maximum variance explained by a single factor was 31%, which is lower than the threshold value of 50% (Harman, 1967). Besides, the poor fit indices resulted from inflated chi-squares of the one-factor model confirmatory factor analysis showed that the proposed model alleviates the common method bias issues.

The mediating effect of openness and resistance to change

After the acceptable result drawn from the CFA model, we followed the structural model analysis to test the proposed hypotheses. Figure 2 presents the overall structural model including the path coefficient values, correlations, and statistical significance across the proposed path directions. The result showed that there is a positive association between technological turbulence and employee's openness to change (β = .23, p < .05), while it is negatively related to resistance to change (β = -.16, p < .05). The result showed that technological turbulence is positively related to service innovation (β = .12, p < .05). Employee openness to change is positively related to service innovation (β = .32, p < .01), whereas resistance to change is negatively associated to service innovation (β = -.21, p < .01). In addition, we tested the mediating role of openness and resistance to change following Baron and Kenny's (1986) covariance-based structural equation modeling and bootstrapping

techniques. We found that there is significant coefficients were found between technological turbulence and service innovation (the direct effect) and between the predictor and mediators such as openness and resistance to change and service innovation.

Insert Table 2 about here

Table 2 demonstrates that there was a variation in between the alternative (Model 3) and the hypothesized model (Model 4) ($\chi 2$ [4] = 26.72, n.s.). The result presented in Table 3 suggested that the hypothesized model is a better fit than the alternative model because of the X^2 statistics result and the subsequent discrepancy between Model 3 (hypothesized) and Model 4 (an alternative) was not significant (χ^2 = 26.72, n.s.) (Byrne, 2016). Given the significant direct and indirect effects of technological turbulence on service innovation, the hypothesized model reflects the partial mediating effect of openness and resistance to change. To further examine the mediating effects, we performed the bias-corrected and percentile bootstrapping at the 95% confidence interval with lower and upper bound confidence intervals to test the mediating role of openness and resistance (Taylor, MacKinnon, & Tein, 2008; Hayes, 2013), to change on the relationship between technological turbulence and service innovation. We found that openness had significant and positive mediating effects on the relationship between technological turbulence and service innovation (indirect effect = .074, $p < .05$, 95% BCaCI [.013, 0.18]), while resistance is negatively mediate such relationship (indirect effect = - 0.89, $p < 0.05$, 95% BCaCI [-.074, -.008]). In such vein, the findings support Hypotheses 1 and 2 that employee's openness and resistance to change partially mediates the association between technological turbulence and service innovation.

The moderated-mediation effect of crisis leader efficacy

As we proposed that crisis leader efficacy is a boundary condition between the indirect effect of openness and resistance to change (Wu & Zumbo, 2008). Thus, to test Hypotheses 4a

and 4b, we analyzed the moderated-mediation effect of crisis leader efficacy on the indirect relationship (via openness and resistance to change) between technological turbulence and service innovation. Based on Edwards and Lambert (2007), Muller, Judd, and Yzerbyt (2005), the moderated mediation effect of crisis leader efficacy was considered if the relationship between the predictor and mediators need to be moderated by crisis leader efficacy, and/or crisis leader efficacy should moderate the relationship between openness and resistance to change and service innovation. Table 3 presents the results of the interaction effects together with fit indices, t-statistics, and p-values of the model.

Insert Table 3 about here

Based on the above-mentioned assumptions, model 1 showed the significant relationship between technological turbulence on service innovation. For the second necessary condition, model 2 showed that the effects of technological turbulence on employee's openness and resistance to change are resulting in the significant coefficient. For the third assumption, model 3, we propose the partial effect of openness and resistance to change on service innovation and the residual effect of technological turbulence on service innovation is assumed to be moderated by crisis leader efficacy. The criterion is service innovation in such models and we found that the interaction effect of openness to change × crisis leader efficacy on service innovation was significant ($\beta = .23$, $p < .05$), while the interaction effect of resistance to change × crisis leader efficacy on service innovation was not significant ($\beta = -1.38$, $p > .05$). Taken together, the result suggested Hypothesis 3b, while it did not support Hypothesis 3c.

Insert Figure 3 about here

As shown in the following Figure 3 and 4 the positive effect of openness to change on technological turbulence was high when there is a higher crisis leader efficacy. The current

study responds to the call for expanding the range of contextual variables like crisis leadership to manage and handle difficulties and changing situations in the tourism and hospitality industry (Pennington-Gray, 2018; Senebto & Hon, 2020). However, the finding did not support hypothesis 3b since the statistical insignificant interaction effect of resistance to change on service innovation was weaker when the level of crisis leader efficacy is high. This implies that employee resistance to change draws from affective, cognitive, and behavioral resistance to change showed an irreconcilable attitude toward service innovation (Oreg, 2006; Turgut & Neuhaus, 2020). In response to technological turbulence and service innovation, employees may become resistive to utilizing new ways and alternative mechanisms, and they may even be opposed to addressing trends in technology (Heidenreich & Kraemer, 2016; Hon, Blom, & Crant, 2014; Oreg, 2006).

Discussion and conclusion

Theoretical implications

The current study provides several theoretical contributions to the hospitality literature and the general crisis management literature. First, concerning cognitive dissonance theory (Hinojosa et al., 2017), the finding provides a dissonance-consonance perspective to better understand openness and resistance to change in anticipating and dealing with technological turbulence and service innovation. In doing so, we responded to the limited theory-based research in the link between technological turbulence and service innovation in hospitality and tourism (Divisekera & Nguyen, 2018; Tajeddini & Martin, 2020). Besides, our study moves beyond the extant hospitality literature by considering the mechanisms of employees' consonance-dissonance-based responses and crisis leadership standpoints, which received little attention in the hospitality literature (Qiu, Dooley, & Xie, 2020). Second, although literature underscores the importance of service innovation to cope with in tourism and hospitality, little is yet clearly known employees and leadership role to promote or inhibit service innovation in

a turbulent situation (Chen et al., 2016). Thus, by revealing the mediating roles of employee's openness and resistance to change and the moderated-mediation effect of crisis leader efficacy on the relationship between technological turbulence and service innovation, we extended the current understanding about the influence of openness, resistance to change, and crisis leadership on the association between technological turbulence and service innovation. The results assist to advance current understandings and provide answers to the parallel questions of when and how technological turbulence influences service innovation performance, and why do some employees are receptive to adapt technological change, whereas others avert it. As shown in Figure 4, Hypothesis 3a suggested that the indirect effect of technological turbulence on service innovation via openness to change is stronger when crisis leader efficacy is high.

Insert Figure 4 about here

Third, the current findings could provide a comparable figure with prior research in hospitality literature that argued that technological turbulence is positively related to service innovation by broadening the scope of service innovation under turbulent business environment align with employees' and leadership intention, competence, and coping mechanisms that in turn determine how to embrace new technologies and processes. The present work portrayed technological turbulence as a means to positively or negatively reinforces service innovation performance of the tourism organization and thus, paved the way to the timely interesting debate of how tourism organizations coping with and handle the regular or sudden change of technology (Divisekera & Nguyen, 2018; Li, Bonn, & Ye, 2019). For instance, we found that crisis leader efficacy as a boundary condition over the direct and indirect relationships among technological turbulence, service innovation, employee's openness, and resistance to change. The present study is timely and relevant given the inadequacy of research on predictors and underlying mechanisms and conditions to facilitate service innovation performance in the

hospitality literature as well as the inescapable effect of technological change and the subsequent adaptation and innovative strategies across every organization. At last, the finding stresses the importance of openness to change and crisis leadership to handle technological turbulence in the emerging hospitality market like Ethiopia as it is necessary to improve the tourism development. Our study offered a nuanced outlook of understanding how technological turbulence can further promote or prevent service innovation in the hospitality industry; thereby it provides an empirical viewpoint to the hospitality and tourism literature in dealing with turbulence and innovation.

Practical implications

The present study carries several practical implications. Given the rapid change in technology and the necessity of pursuing service innovation in the hospitality context, there is an evolving need across every organization to cope with technological turbulence. For example, COVID-19 raises the sudden importance of online service delivery, technological prerequisite, and adaptation. Similarly, the tourism industry has been continuing to experience highly turbulent environments and they strive to adopt innovative services to cope with fluctuating situations and work environments. The current study suggests the necessity of openness to change to maintain a higher level of engagement in service innovation to handle the turbulent business environment. Our study stresses that managers need to focus on leadership efficacy and openness to experience new and alternative working methods and procedures to positively shape technological turbulence and enhance employees' service innovation and assists to manage competitive edge in the market. For instance, adapting and confronting with alternative bookings and alternative reservation procedures require openness to experience upcoming technological tools and resources.

Managers and human resource practitioners in the hospitality industry could consider training to extend openness to experience and probing new procedures and strategies to adapt to service innovation. Using psychometric tests involving receptive and resistance mindsets or related behavioral items are suggested to identify psychological intents of employees during the hiring process, performance appraisal, and human capital development processes. In doing this, managers could develop customized strategies to encourage employees' active participation in the process of coping with technological turbulence and practicing service innovation. As service innovation necessitates considerable organizational and employees' efforts to initiate and engage in the generation and application of new ideas and alternative work processes (Ottenbacher & Harrington, 2007; Storey et al., 2016), the leadership and welcoming attitude to alternative work procedure is somehow compulsory. In such an instance, leaders' efficacy could be an additional asset to create a conducive work environment that encourages flexible and adaptable work attitude among members of an organization. At last, in supporting the sustainable development goals (SDGs) (specifically SDG goal 8 and 9 – related to decent work and innovation) in developing countries (United Nations, 2018), the study suggests for hospitality managers and policymakers to consider technological uncertainties and the way to encourage adaptability of firms by taking into account openness and crisis leadership.

Limitations and future research directions

This study is inherited to several limitations. For instance, we collected data from Ethiopia, a developing economy with promising growth and development in hospitality, but the country's tourism industry faces several internal and external issues ranges from service quality, human resource to macro-level societal issues. Thus, drawing from the concept of individual behavior differ across contexts (Mason & Leek, 2008), we advocate upcoming studies to contextualize the underlying relationship between technological turbulence and

service innovation in other emerging economies to widen the current perspectives and to strengthen the generalizability of the current findings. We also suggest future researchers consider the comparative analysis between developing and developed economies and across different types of hotels. Future studies are encouraged to consider customers' involvement and their standpoints in technological turbulence and service innovation in tourism and hospitality to better understand the comprehensive outlook of how tourism organizations' response to turbulent situations. Although we assess comprehensive outlook of response to situations i.e. openness and resistance, and leadership role in managing turbulence and innovation in hospitality, upcoming studies are suggested to examine the effect of organizational climate and culture, learning, resilience and commitment (Bani-Melhem, Zeffane, & Albaity, 2018) to further improve the current attempt to probe the relationship between technological turbulence and service innovation.

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Table 1

Means, Standard Deviations, and Correlations of Variables

Variable	Means	SD	1	2	3	4
Technology turbulence	5.2	2.10	**.38**			
Openness	5.42	1.74	.34*	**.44**		
Resistance to change	2.44	.22	-.25**	-.41**	**.31**	
Service Innovation	5.01	2.05	.18*	.29**	-.31*	**.35**
Crisis leader efficacy	4.9	1.42	.15**	.30**	-.27**	**.40**

Note: Boldfaced diagonal values represent the Square root of AVE; Off-diagonal numbers represent inter-construct correlation values.

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Table 2
Summary of Model Fit Indices

Model Test	***χ2***	***df***	***CF***	***GF***	***TLI***	***RMSEA***
1. Independent model	1134.32	917				
2. Measurement model	945.76	763	.97	.90	.97	.034
3. Hypothesized model (Figure 1)	985.71	763	.95	.90	.97	.034
4. Alternative model: Additional direct paths from market turbulence to service innovation	1012.43	811	.93	.90	.95	.054

X^2 values for the measurement and structural models are significant at p <.01

Table 3
Interaction effects

Constructs	***beta***	**t-value**
Main effects		
TT → OP	.23	3.85**
TT → RES	-.16	-2.98*
OP → SI	.32	2.50**
RES → SI	-.21	-1.92**
SI → TT	.12	3.50*

Moderated mediation effects:		
Model 1 (Criterion: OP) CLE*TT	.19	3.47*
Model 2 (Criterion: RES) CLE*TT	-.0.56	-1.35*
Model 5 (criterion: SI) CLE*RES	-1.38	-2.16
Model 4 (criterion: SI) CLE*OP	.23	1.82**

Note: *OP - openness to change; RES - Resistance; TT - technology turbulence; SI - service innovation; CLE - crisis leader efficacy*

Figure 1

Research Model on Technological turbulence and Service Innovation

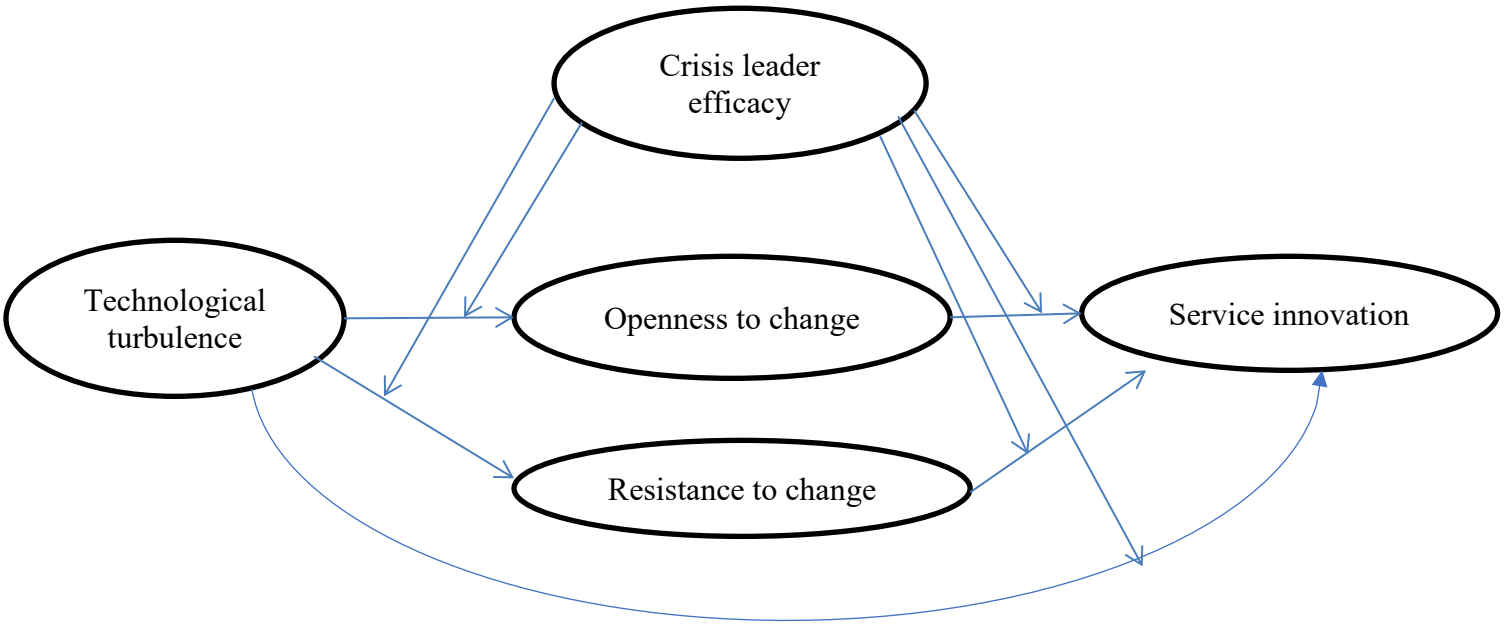

Figure 2
Research Model on Technological Turbulence and Service Innovation

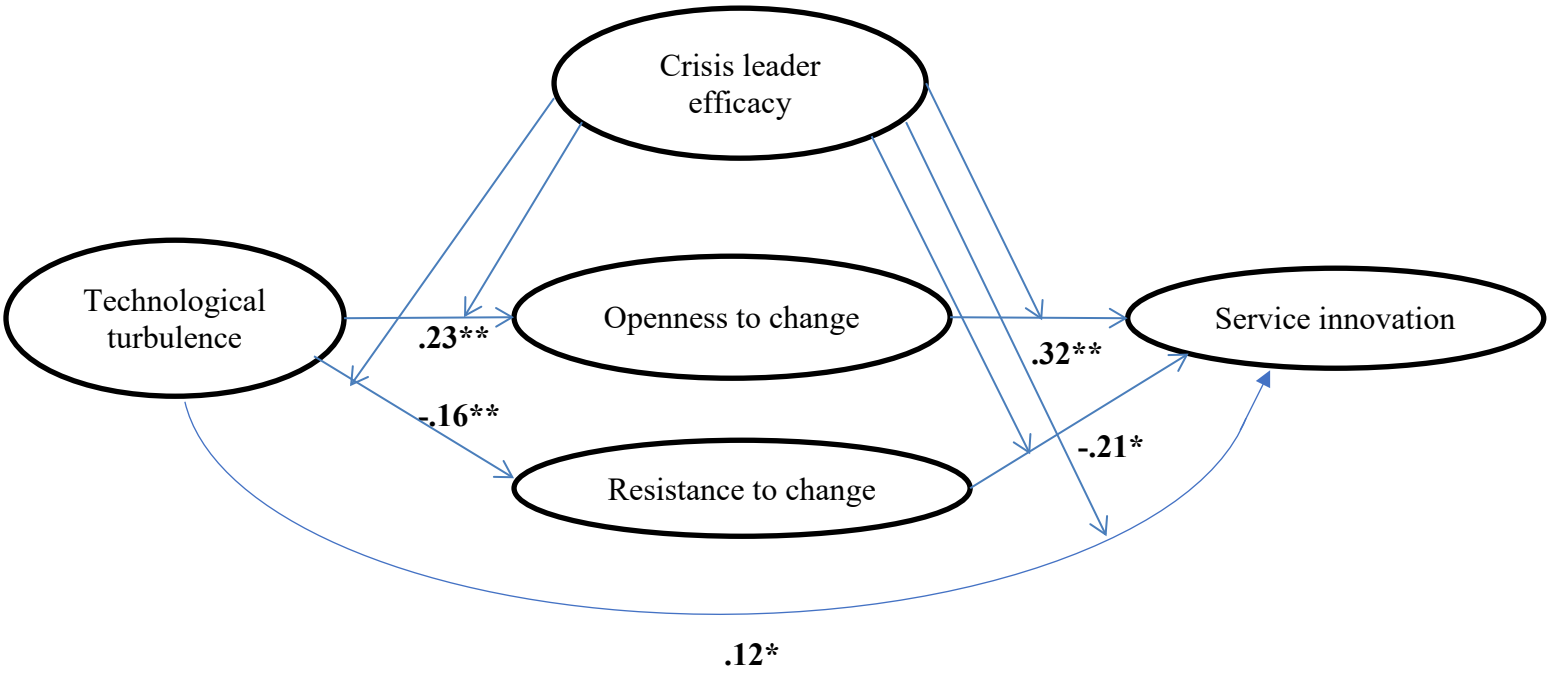

Figure 3

Crisis leader efficacy as a moderator of the relationship between technological turbulence and openness to change

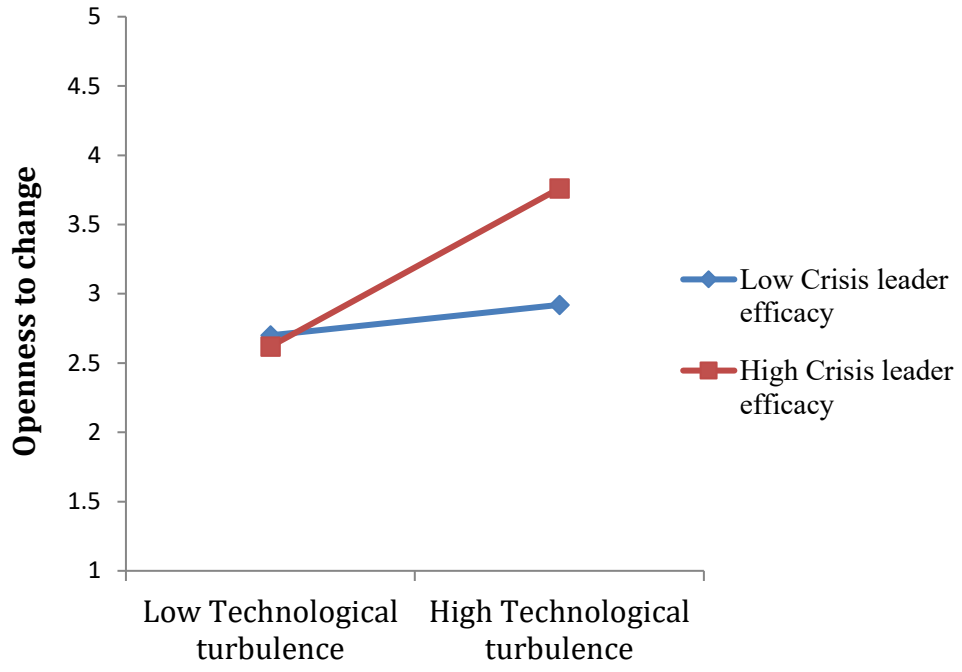

Figure 4

Crisis leader efficacy as a moderator of the relationship between technological turbulence and service innovation