Conference Abstract

A dual perspective of organizational resilience (OR) and information technology systems resilience (ITSR): an analysis of interdependencies and tensions

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Abstract

Contemporary organizations face a rising incidence of disasters, extreme events and crises (Boin and Lodge 2021). In parallel, the socioeconomic landscape is increasingly complex which intensifies inter-organizational dependencies and the risk of cascading failures (Ansell et al. 2021). To survive and perhaps thrive, organizations must cultivate organizational resilience (OR). However, their capacity to do so is currently curtailed. Although it is widely recognized that the performance of organizational processes, functions and capabilities is closely aligned to the effectiveness of associated information technology systems (ITS) (Schultze and Orlikowski 2004); models of OR have yet to elucidate mechanisms by which ITS contribute to resilience capabilities (Annarelli and Nonino 2016). In this conceptual paper, which is a work in progress, we reflect upon the nature of interdependencies and tensions between ITS resilience (ITSR) and OR. We adopt a deductive, qualitative approach to systematically compare OR & ITSR. Our comparative analysis is informed by OR models described by Duchek (2020), Sheffi and Rice Jr (2005) and Weick and Sutcliffe (2011), while for ITSR, we employ the Reactive Manifesto as interpreted by Bonér et al. (2014) and Debski et al. (2017).

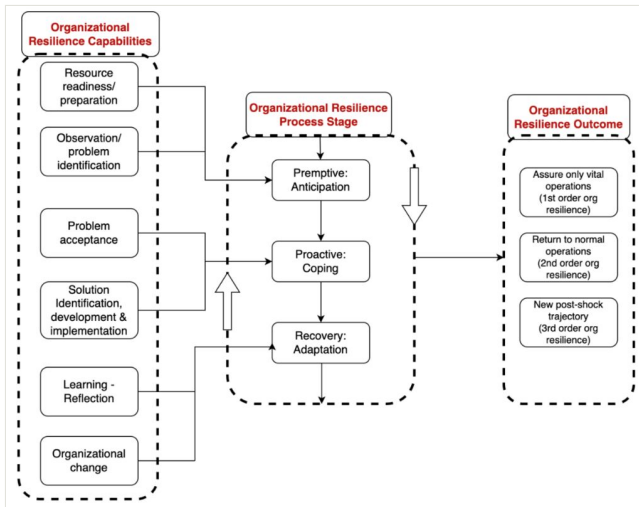Figs 1, 2 illustrate our interpretation of each resilience construct.

Figure 1. doi

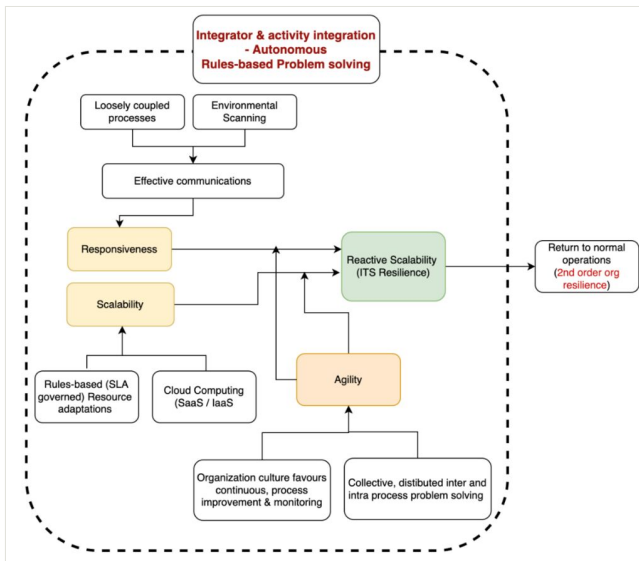Organizational resilience framework (Gardner Le Gars, Simonin, Waldeck and Puentes – working paper).

Figure 2. doi

ITS resilience framework (Gardner Le Gars, Simonin, Waldeck and Puentes – working paper).

As may be seen on Fig. 1 we interpret OR as a three-phase process including preemptive, proactive & recovery phases each possessing associated resilience capabilities. The

process may occasion three operational outcomes (or levels of resilience maturity). *1st*, *2nd* and *3rd order* resilience denote organizations that when a disruption occurs,

1.   merely maintain key operations,
2.   rapidly achieve a return to normal operations or
3.   that capitalize on a disruption to achieve an improved post-shock trajectory respectively.

ITSR is interpreted via the notion, *reactive scalability* which describes an organizational system that is both responsive and scalable (Debski et al. 2017) i.e., which is able to rapidly achieve (responsive) appropriately dimensioned (scalable) adaptations to intra and extra-organizational changes.

Our analysis employs a multi-level approach. The preliminary results of the analysis are presented in Table 1.

Table **1.**

Preliminary results of multi-level analysis of Organizational and Information Systems Resilience.

ANALYTICAL LEVEL	PRELIMINARY RESULTS
Goals of OR	**Foreseen & Unforeseen shocks:** targets the tryptic of 1st, 2Nd or 3rd order resilience depending upon the nature of the shock
Goals of ITSR	**Foreseen Shocks:** • **1st & 2nd order resilience targeted via** Service Level Agreement (SLA) while 3rd order not relevant as ITS changes are not emergent but are planned, strategic initiatives) • **Unforeseen shocks:** the elasticity of ITS is limited to contractually agreed resources/ services (SaaS (software as a service), IaaS (infrastructure as a service)). This impacts its capacity to achieve sufficiently dimensioned adaptations
Temporality - OR	• **Resilience activation: resilience is latent -** It materializes (i.e., becomes tangible) only when the need to moblize /reconfigure physical & human resources has been recognized & fulfilled. Personnel consequently suffer from reduced adaptive abilities compared to ITS personnel
Temporality - ITSR	• **Resilience activation**: **a continuously emergent and tangible phenomenon** • **Foreseen shocks (FS):** ITSR can be instantly activated (with or without human intervention) via cloud-based business services (SaaS, IaaS) to rapidly achieve *reactive scalability* (Liu et al. 2010) • **Unforeseen shocks (UFS):** ITSR lags OR activation & if ITS remain operational, they function in a degraded mode • **Both types of shock (UFS & FS):** organizational integration ensures that ITSR is continuously honed & tested via a tight collaboration between a business integrator & roles that are part of the business process. This expedites problem-solving and improves decision-making capabilities as the adaptive capacities of ITS personnel are frequently solicited

ANALYTICAL LEVEL	PRELIMINARY RESULTS
OR Drivers	Flexible and agile organizational structures - boundaries may be transgressed & resources moblized on demand in a culture that supports: • Expert-driven, devolved problem solving & improvisation and freedom to break rules
ITSR Drivers	Three key capabilities (organizational integration, organizational agility, organizational cloud) confer ITSR via the provision of local reactivity, autonomous, expert-driven problem solving & discretionary redundancy via cloud-based extra-organizational services/ resources Limitations: anomalous information may not fit local processes. Contractual inertia impedes changes to roles, rules, protocols & access to additional resources. • Less well adapted than OR for unanticipated shocks

Upon completion of the analysis, we will elaborate theoretical propositions pertaining to the relationship between the OR and ITSR constructs to guide subsequent empirical research to bridge the theoretical divide between these in reality, indissociable resilience constructs. This comprises the main anticipated contribution.

Keywords

Organizational resilience, information technology systems resilience.

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Conflicts of interest

The authors have declared that no competing interests exist.

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