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Examining the impact of Cloud ERP on sustainable performance: A dynamic capability view

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ABSTRACT

The infusion of cloud-based operations, industrial internet connectivity, additive manufacturing, and cybersecurity platforms has not only re-engineered but also revitalized modern factories (Industry 4.0). Cloud-based Enterprise Resource Planning (Cloud ERP), which is a part of the cloud operations and one of the four major pillars of Industry 4.0, helps to attain higher levels of sustainable performance. Organizations invest considerable time and money to acquire both tangible and intangible capabilities to rise as an Industry 4.0 business. A great deal of research has focused on the bifurcation of the actual characteristics of performance. This study investigates the hidden linkage between one of the significant pillars of Industry 4.0 (CERP) and attributes of sustainable organizational performance while considering the effect of variables like firm size, cloud service type, and offerings that enact as control variables while achieving sustainable performance. The proposed hypotheses were empirically examined using primary cross-sectional data. Following Dillman (2007) guidelines, 209 responses were collected from technologically driven organizations and analyzed using partial least square structure equation modelling (PLS-SEM). The results offer interesting implications to the theory and provide further guidance to managers.

1. Introduction

Swift technological advancement over the past few decades have radically improved organizational performance, but at the same time, created higher expectations toward making business operations more sustainable (Ruiz-Mercader, Merono-Cerdan, & Sabater-Sanchez, 2006). When allocating substantial amounts of monetary and other flexible resources into their business operations, organizations are bound to meet market expectations (Meulen & Rivera, 2014). Unlike the past, when only a handful of organizations have access to the latest technology, today's organizations are privileged to savor the landscape of future-required technologies (Chen, Das, & Ivanov, 2019). Mahmood, Mann and Zwass (2000) and Weill (1992) bridge the actual relationship between technological investment and performance, specifically in the past two decades. However, today's organizations are skeptical when making technological investment decisions as differential performance is still awaited (Dubey, Gunasekaran, Childe, Papadopoulos et al., 2019; Dubey, Gunasekaran, Childe, Roubaud et al., 2019). Racing toward achieving sustainability in business operations, organizations are open toward adapting green practices. According to Jabbour, de, Jabbour, Filho and Roubaud (2018), organizations can achieve higher market sustainability if they meet economic, social, and environmental requirements. Sustainable performance is dependent on business operations (Pfeffer, 2010), which are driven largely by objective and strategy. Green and transparent business practices help an organization retain its most important resource — humans. These practices are also critical to transform Cloud ERP into dynamic capability, which can lead to sustainable performance. In a sense, sustainable business practices and performance are closely connected and affect organizational sustainability. The past three industrial revolutions were majorly driven by technological and procedural upliftment, but the fourth revolution marks a drastic change more focused on the right match of smart-centric resource capabilities and sustainable performance. According to Lin and Chen (2012), the initial adoption of these technologies may be more expensive; however, in the long run, they strengthen the core structure of the organization and give it a competitive edge. Liu and Yi

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(2018)extend the discussion and advocate the mutual benefits of all players in the supply chain making decisions using big data investment (BDI). The paradigm shift from technology-oriented operations to smart centric decision-making may boost organizations (tech-based as well as non-tech-based) to acquire resources that can bundle enable them to develop future-ready factories (Phadermrod, Crowder, & Wills, 2019). Fatorachian and Kazemi (2018) identify a comprehensive list of enablers of Industry 4.0, on which having cloud-based resource capabilities is at the top, as it quantifies uncertainty and abnormalities accurately and efficiently. Not only this, its self-learning capability (Helo, Suorsa, Hao, & Anussornnitisarn, 2014) used with a real-time information flow strengthens the organizational structure internally and externally, making it easy to adapt (Abedi, Fathi, & Rawai, 2013; Bruque-Cámara, Moyano-Fuentes, & Maqueira-Marín, 2016; Schniederjans, Ozpolat, & Chen, 2016; Subramanian, Abdulrahman, & Zhou, 2015; Xing, Qian, & Zaman, 2016) with other partners of business operations.

When considering Cloud ERP and other such technologies as a resource for an organization, the resource-based view (RBV) authored by Barney (1991) best fits. The RBV (Hitt, Xu, & Carnes, 2016) encourages businesses to invest and nurture their resources into capability, which will maximize overall organizational performance. However, RBV does not address how organizations leverage their resources and capabilities in a highly dynamic and disruptive market because RBV is a static theory (Kraaijenbrink, Spender, & Groen, 2010). Therefore, this study grounds itself around the dynamic capability view (DCV) postulated by Teece, Pisano and Shuen (1997), which is an extension of RBV. Zhang, Qu, Ho and Huang (2011) define the industrial internet as a bridge connecting organizational resources and smart operational functioning. Cloud ERP has emerged as a dynamic capability, as it integrates the organizational functions on cloud platforms in real time (Duan, Faker, Fesak, & Stuart, 2013). Its capability of handling high volume data with improved accessibility and standards at low setup and operating costs makes it a true dynamic organizational resource (Salleh, Teoh, & Chan, 2012). According to Schoenherr (2012), firms' sustainability is a combination of high economic value, social initiatives, and compliance with environmental norms. Gupta and Misra (2016) classify dynamic capabilities into three major facets: i.e., technical, people, and organizational factors. Dubey, Gunasekaran, Childe, Papadopoulos et al. (2019); Dubey, Gunasekaran, Childe, Roubaud et al. (2019) and Gunasekaran et al. (2017) outline various reasons that dynamic resources like cloud services can lead to sustainable organizational growth. Demirkan, Cheng and Bandyopadhyay (2010) and Helo et al. (2014) define Cloud ERP as the catalyst for real-time information flow between department and manufacturing processes. Continuing the same line of thought, various researchers (Duan & Liu, 2016; Radke & Tseng, 2015; Schniederjans et al., 2016; Subramanian et al., 2015) study the impact of Cloud ERP on collaboration and coordination with supply chain partners. Previous literature (Abedi et al., 2013; Bruque-Cámara et al., 2016; Schniederjans et al., 2016; Subramanian et al., 2015; Xing et al., 2016) hint that Cloud ERP catalyze supplier integration, which leads to better financial, operational, and environmental performance. But in the era of Industry 4.0, where we expect businesses to be highly optimized and at the same time possess the characteristics of sustainability, organizations must focus on triple bottom line performance i.e., economic, social, and environmental performance. As mentioned, a large number of studies have greatly \discussed how operational performance is linked with cloud-based technologies, making it is evident that Cloud ERP is instrumental in attaining sustainable organizational performance. At the same time, it requires a clear understanding of the critical factors which enable cloud ERP to achieve sustainable performance. Considering that gap in the literature, this study addresses the following research questions:

RQ1- What are the critical factors instrumental in developing Cloud ERP as the dynamic capability for any technological organizations?

RQ2- How is Cloud ERP related to achieving triple bottom line performance?

Although Peng and Gala (2014) study concerns related to the adoption of Cloud ERP, its impact on firm's performance is still undefined. One reason this isn't clear is that technology like Cloud ERP must be studied in depth with its proper application and implications, which requires a great deal of time. Future-ready factories (Industry 4.0) are inclined to quickly acquire and deploy smart technologies to reap overall sustainable organizational performance (Jabbour et al., 2018). These factories adopt new technology so quickly, there often isn't time to analyze its applications properly. Interestingly, no evidence in the literature illuminates the above conjecture. Also, this study clarifies the positive effect of control variables on sustainable performance. For the study, we consider technological firms operating in the business sector in India. The data was collected from 209 respondents working in micro, small and medium enterprises, and large technologically advanced organizations. The select organizations are of diverse domains riveted toward smart resources and equipped with intelligent information-processing tools and talents.

The paper is organized in the following manner. In Section 2, we give a brief literature review about the DCV as well as organizational resource capabilities and its effect on organizational performance. In Section 3, we give a theoretical framework with the proposed hypothesis. Section 4 explains the methodology employed for conducting this research. In Section 5, we discuss the literary contributions of our results and the managerial applicability of our research framework. Section 6 throws light on the limitations of our current study and future possibilities of the work. The paper also accommodates two supporting tables in the form of appendices. Table A1 in Appendix A shows the number of constructs considered in this study after a rigorous review of the literature. Table A2 in Appendix A follows the table that depicts the combined loading and cross-loading of constructs.

2. Theoretical background

Many researchers have contributed to literature explaining the importance of cloud computing in business operations. Dwivedi and Mustafee (2010) discuss the facilitating factors while adopting cloud computing. Helo et al. (2014) evidence that cloud-computing based manufacturing systems enable information flow between department and manufacturing processes. Chen, Liang and Hsu (2015) open up a new discussion while providing options for web services over Cloud ERP. Supply chain integration plays a vital role in the smooth functioning of a business. Sharma and Shah (2015) discuss the role of Cloud ERP in improving supply chain productivity. Although the plentiful literature related to cloud computing is still lacking, but past researcher (Bayramusta & Nasir, 2016) presented a comprehensive review on cloud computing. Cloud ERP provides smooth collaboration amongst supply chain partners and positively impacts the firm's performance (Demirkan et al., 2010; Duan & Liu, 2016; Liu, Srai, & Evans, 2016; Radke & Tseng, 2015; Schniederjans et al., 2016; Subramanian et al., 2015). Also, cloud-based supply chain management (CSCM) increases the supply chain responsiveness (SCR) (Giannakis, Spanaki, & Dubey, 2019). Many applications of cloud-computing in healthcare organizations have recently emerged (Rajabion, Shaltooki, Taghikhah, Ghasemi, & Badfar, 2019). The literature shows the possibilities and available avenues for cloud computing, which might lead to better performance of firms, but there is a lack of empirical evidence to validate these relationships.

2.1. Dynamic capability view

Teece et al. (1997, p.516) define dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments". We base our study on the seminal work of Teece et al. (1997), who define dynamic capabilities as an organization's ability to reconfigure and transform resources in an uncertain or erratic setting. Leonard-Barton (1992) defines dynamic capability as the ability of an organization to achieve innovative forms of competitive edge. Considering stakeholders as a significant component of dynamic capability, organizations have already witnessed a pragmatic change that forces them to prepare for flexible changes. Irrespective of size, resources of distinct capabilities may lead organizations to their next level of productivity. Previous studies (2002, Eisenhardt & Martin, 2000; Helfat, 1997; Luo, 2000; Zott, 2003) also discuss the dynamic capability view, and their results reflect the firm's ability to use innovation to gain a competitive advantage, given path-dependencies and market positions. Using a firm's resource strength strategically can cultivate the critical relationship between capabilities and strategic choices (Wang, Klein, & Jiang, 2007). The DCV suggests that businesses can catch up with the changing environment by reconfiguring and transforming their capabilities and procedures (Kogut, 1991; Kyläheiko, Sandström, & Virkkunen, 2002; Sanchez, 1993).

In the past two decades, perspectives toward organizational resources have changed. Now, organizations invest more in smart resources than need-based ones. Since the first industrial revolution, businesses require a set of specific factors to run their operations smoothly, these factors have evolved with each subsequent revolution. A great deal of research has proposed classifications (organizational, human, and technological factors) of these resources. Despite its importance, the human element has garnered little attention in academic research on the successful deployment of technologies in smart factories (Gupta & Misra, 2016), and it must be further explored from the perspective of the RBV.

2.1.1. Organizational factors (OF)

A well-defined organizational structure motivates business operations to succeed in abrupt market conditions and provide internal strength. Giving importance to the structure, Pugh, Hickson, Hinings and Turner (1968) describe the foundation of organizations based on their flexibility of operations, specialization in technology, standardization of processes, formalizations in working, and complexity in their workflow. Though the importance of structure has been studied in many seminal and non-seminal research domains, in practice, defining a proper organizational structure is still in its infancy. Dwivedi et al. (2017) advocated that functional innovation can be seeded into the system through big open-linked data (BOLD). Liu and Yi (2018) study the effect of BDI on the performance of a three-stage supply chain. Industrial revolutions demand both the upliftment of technology and knowledge, which must be complemented with organizational thinking or its factors. Gupta and Misra (2016) show the importance of organizational factors when implementing cloud-based services in future factories. Organizations that are prepared to transform into future-ready factories must welcome advanced technologies instead of foregoing them due to budget constraints. Organizational factors combined with progressive working policies lead a business to acquire resources that are distinctive and smart and can complement the model defined in Industry 4.0.

2.1.2. People factors (PF)

'Technological innovations drive businesses, but knowledge helps achieve excellence.' This quote is considered by professionals laying a path for their business operations. Human factors are considered a soft strategy due to their sensitivity. Ghazinoory, Abdi and Azadegan-Mehr (2011) explain the substantial effects of environmental culture on the motivation levels of people, a designated stakeholder of an organization through SWOT, which analyzes strength, weakness, opportunities, and the threat for the organization. Boone, Hazen, Skipper and Overstreet (2018) investigate how big data equips service managers to face challenges and make critical decisions. A more motivated work environment and effective personnel policy ensure the overall growth of both individuals and organizations. Shao (2019) explains the importance of strategic leadership and organizational culture, which impacts the deployment decision of information technology into the system. The credibility of excellence is limited if it cannot pool with the characteristics of sustainability. Gupta and Misra (2016) establish the crucial role of people factors in an organization's technological advancement. This study shows the different foci of business ecosystems, such as trust with vendors, the involvement of people in decision-making, and employees' training, create a strong bond of trust and add to the pool of knowledge that cannot be imitated by competitors. Also, these knowledge stakeholders can help acquire resources like Cloud ERP, which is also one of the four pillars of Industry 4.0.

2.1.3. Technological factors (TF)

Tech-savvy organizations often enjoy advanced technologies in their original form, as they are always readily available to facilitate the change in technology, irrespective of scale. Organizations aspiring to become smart, follow the triple-A (Agility, Adaptability, Alignment) principle (Lee, 2010) of the supply chain, which means they allow agility in their operations, tend to align themselves with the stakeholders, and are more efficient in adopting new technologies. Technological factors play a vital role in transforming the state of the operations. According to Gupta and Misra (2016), technological factors serve as a platform for introducing the Cloud ERP system as a resource for Industry 4.0. Technical skills play an instrumental role in deploying IT and strengthen the technological factor in organizations - the absence of which will lead to disaster in the adoption of IT (Dwivedi et al., 2014). Previous scholars (Garrison, Wakefield, & Kim, 2015) explain how firms can leverage their IT capabilities for nurturing cloud-supported processes to enhance its operational performance. Organizations racing to be future-ready should invest in their technological factors for sustaining long-term sustainability.

2.2. Organizational resources: cloud ERP

One of the significant pillars of Industry 4.0, Cloud ERP often faces resistance because of its unexplored potential. Though many frameworks are available to realize the potential of Cloud ERP, organizations find them hard to understand (Chandrakumar & Parthasarathy, 2014). They fail to realize it is simply an ERP hosted on a cloud service provider. Brettel, Friederichsen, Keller and Rosenberg (2014) and Zhu, Song, Hazen, Lee and Cegielski (2018) argue that the industrial internet is the primary enabler of Industry 4.0. Small and medium enterprises (SMEs) are the frontrunners that use Cloud ERP services because of their benefits, but because the cost of implementation is on the higher side, organizations are skeptical about deploying it. Though industries are using artificial intelligence for their decision making, they do not have a clear understanding of the challenges (Duan, Edwards, & Dwivedi, 2019). There are additional concerns like management of technology, security, and optimum utilization. Organizations desiring to reap cost-benefit and maximum sustainable performance out of the Cloud ERP must realign their stakeholders in a way that accommodates change and give avenues for nurturing cloud computing services in the most cost-efficient manner. Exploring the usefulness of cloud technologies, Ismagilova, Hughes, Dwivedi and Raman (2019) investigate the positive impact of Cloud ERP services in developing smart cities.

2.3. Sustainable performance

The past decade has witnessed an increased popularity of sustainable growth amongst business lexicon. However, since the emergence of Industry 4.0, organizations are exploring avenues for entrenching sustainability by tilting their focus from performing economically to further excelling socially and environmentally. Therefore, to maintain equilibrium between operational and economic performance, organizations must make concerted efforts to harness sustainable performance by maximizing organizational capabilities (Székely & Knirsch, 2005).

Malesios, Dey and Abdelaziz (2018) study critical practices that support the progress of economic, social, and environmental performance in supply chain management through a performance measurement model. The evident impact of business analytics on improving a firm's sustainable performance and agility is profound in the literature (Ashrafi, Zare Ravasan, Trkman, & Afshari, 2019). Organizations should compete based on these initiatives and follow the triple bottom line approach that measures growth concerning economic, social, and environmental aspects (Dubey, Gunasekaran, Childe, Papadopoulos et al., 2019; Dubey, Gunasekaran, Childe, Roubaud et al., 2019; Kumar, Luthra, & Haleem, 2014). Gupta and Misra (2016) give critical indicators of sustainable performance that compositely lead to the overall organizational performance. Therefore, for this study, we explicitly consider the classification of organizational performance given by them.

2.3.1. Economic performance

Economic growth takes the front seat for most organizations and can be achieved by an effective inter-organizational information system leading to increased supply chain capabilities (Rajaguru & Matanda, 2013). The unending greed of stakeholders compels an organization to keep up with technology and synchronize itself with the changing dynamics of the business environment. Technological advancement and changes in the business ecosystem trigger the need for procedural change through industrial revolutions, which can help expand profits. Fatorachian and Kazemi (2018) study the list of enablers specifically for Industry 4.0, which can act as resources to achieve sustainable economic performance. King and Lenox (2001) test efforts that have a positive effect on a firm's economic performance. Economic performance helps build an ecosystem for business process operations and gives scope to oblige stakeholder's expectations.

2.3.2. Environmental performance

As businesses expand their boundaries internationally, they are directed to follow global norms. Due to amendments of government environmental policies and an increased concern for the environment amongst the stakeholders, factories and businesses orient themselves to adopt environment-friendly practices. The concept of the green supply chain was introduced and studied by scholars whose results indicate that a higher degree of green practices lead to higher economic performance (Zhu & Sarkis, 2004). According to González-Benito and González-Benito (2006), environmental sustainability and green organizations are high on managerial agendas. Montabon, Sroufe and Narasimhan (2007) advocate the need for environment management as a standard procedure. Organizations are encouraged to implement environmental management systems proactively. Firms can achieve higher levels of environmental productivity by reducing by-products and residue due to emission, and they also can leverage lean production processes for improving economic performance (Pil & Rothenberg, 2003). Song, Fisher, Wang and Cui (2018) study environmental theories and propose the deployment of big data to achieve higher environmental performance. Oliveira, Martins, Sarker, Thomas and Popovič (2019) state that there is a Cloud ERP that moderates environmental impact while achieving performance.

2.3.3. Social performance

Since their inception, organizations have invested in social initiatives to build a reputation amongst their stakeholders outside the organizational boundaries. With the expansion of business to cross borders, the definition and purpose of social performance have also changed. External pressure and government norms indulge and motivate organizations to achieve heights in social performance. Carter and Rogers (2008) argue that an organization can achieve prominence in social performance if they strategically coordinate all the critical interorganizational business processes. Zhu, Sarkis and Geng (2005) consider social performance to be an essential aspect of sustainable organizational performance. Modern organizations striving to achieve sustainable performance manage to have a strong social performance by employing ethical practices, open communication, and obeying societal obligations. Social performance cannot directly affect the organization, but it can become the backbone of a business during the time of disruption.

3. Theoretical model and hypothesis development

The quintessence of this study is cloud-based operations/cloud computing, which is one of the significant enablers while setting up Industry 4.0. The entire premise of this research revolves around the DCV postulated by Teece et al. (1997). With sound stakeholder participation in organizational structure and functions, organizations can use their resources to achieve the next level of operational excellence while continuing sustainable performance. According to Bogoviz (2019), Industry 4.0 promises to be the most ambitious industrial change ever because it influences the business environment at all levels of operation. Unlike the past three industrial revolutions, which were mostly technology driven, Industry 4.0 is an incumbent of advanced technology, smart connectivity, and intelligent decisions. Future-ready organizations follow the triple bottom line, which concentrates on economic, social, and environmental growth (Dubey, Gunasekaran, Childe, Papadopoulos et al., 2019; Dubey, Gunasekaran, Childe, Roubaud et al., 2019; Kumar et al., 2014). Recent literature focuses on how organizations strategically maximize their resources to shape them as enablers of Industry 4.0 (Fatorachian & Kazemi, 2018). Scholars like Brettel et al. (2014) and Zhang et al. (2011) consider the industrial internet to be one of the main enablers of Industry 4.0. In their case study, Li, Nucciarelli, Roden and Graham (2016) analyze the potential of big data and Cloud ERP in future-ready organizations like Walmart, Philips, eBay, and Volkswagen.

Cloud ERP promises to be the most significant driver in delivering organizational performance. According to Porter and Heppelmann (2014), cloud-connected digital services are a global trend and allow organizations to launch smart products and develop remote monitoring capability, which can enhance the reach of their product/services while taking care of security issues. Though the initial adoption and implementation cost of technology can be very high (Lin & Chen, 2012), its long-run contribution to organizational and economic development makes the investment worthwhile. Hsu, Ray and Li-Hsieh (2014) examine the possible intention behind the adoption of cloud-based services, and the pricing mechanism evolved in it. Industry 4.0 improves transparency in the system by connecting the physical and virtual worlds through cyber-physical systems (CPS) and the Internet of Things (IoT) with enhanced continuous communication (Li et al., 2016; Öberg & Graham, 2016).

Further, Kagermann, Wahlster and Helbig (2013) describe manufacturing organizations that use smart networks (cloud computing) and autonomous micro-computers (embedded system) to enhance production levels. Pagell and Shevchenko (2014) emphasize that organizational performance should be embedded in all aspects. Previous studies (Schoenherr, 2012; Zhu & Sarkis, 2004; Zhu et al., 2005) offer a possible perspective of sustainable organizational performance and classify it into economic, environmental, and social performance. In addition, previous researchers (Dubey, Gunasekaran, Childe, Papadopoulos et al., 2019; Dubey, Gunasekaran, Childe, Roubaud et al., 2019; Gupta & Misra, 2016) establish a positive relationship between Cloud ERP and organizational performance. Dubey, Gunasekaran, Childe, Papadopoulos et al. (2019); Dubey, Gunasekaran, Childe, Roubaud et al. (2019) and Kumar et al. (2014) state that future-ready organizations under the umbrella of Industry 4.0 adopt the triple bottom line, whose central focus is on economic, social, and environmental growth. While technological enablers do guarantee performance, they must complement other proper tools and skill sets. Gupta, Kumar, Singh, Foropon and Chandra (2018) point out the crucial role of Cloud ERP while achieving greater performance, but Novais, Maqueira and Ortiz-

Bas (2019) argues that literature related to Cloud ERP and overall business performance is quite scarce. Existing literature (Roumani & Nwankpa, 2019) often points out negative aspects associated with Cloud ERP due to increased incidents in past few years, but there is a lack of literature showing the direct contribution of cloud-based operations/cloud operations to organizational performance. This study considers the gap in research and tries to postulate the relationship between Cloud ERP enablers of Industry 4.0 and organizational economic performance. Thus, we propose our first hypotheses:

H1. Cloud ERP services have a positive impact on the economic performance of an organization

Al-Mashari, Al-Mudimigh and Zairi (2003) argue that the benefits of Cloud ERP can be fully realized only in conditions when there is an IT strategic alignment (Henderson & Venkatraman, 1993) and a reconciliation mechanism is established between technical and organizational imperatives. Scholars like Brousell, Moad and Tate (2014) analyze the challenges faced by organizations, specifically in developing countries, while transforming machine-generated data into valuable information that can facilitate decision making. Scholars studying traditional organizations (Babiceanu & Seker, 2016; Kazan, Tan, & Lim, 2015; Roden, Nucciarelli, Li, & Graham, 2017; Sifah et al., 2018; Windmann et al., 2015) express that 95 % of the data generated in the manufacturing industry is not processed or used effectively. Seethamraju and Krishna (2013) point out insufficient ERP functions with two major concerns (1) data is mostly disseminated information, and (2) a low level of accessibility of information exists at cross borders. According to Holt and Ghobadian (2009), the environmental initiative taken by modern organizations and their effect on performance needs investigation at the global level. Cloud ERP and other enablers of Industry 4.0 ensure the maximum utilization of information. Organizations' capabilities aim to trim down and avoid duplicity of information in the pipeline, the concern raised by Zhu et al. (2018). The increase in environmental pollution is due to unutilized information or excessive use of non-green resources for utilizing the information. Jabbour et al. (2018) establish the relationship between the circular economy and Industry 4.0. Ghouri and Mani (2019) analyze how Industry 4.0 benefits by Cloud ERP sharing information in real time. The environmental concern encourages and at the same time stresses firms to choose resources that can help to attain higher environmental performance. It is also evident in literature that green resources help to bring the environmental performance to a much higher level. Cloud ERP not only hastens the information transaction procedure but also cuts down the information's loss i.e., it helps maximize resources. To study the impact of Cloud ERP on environmental performance, this study proposes its second hypothesis:

H2. Cloud ERP services have a positive impact on the environmental performance of an organization.

Golightly, Sharples, Patel and Ratchev (2016) study the importance of the human factor in cloud manufacturing integration. Mourtzis, Doukas and Milas (2016) state that social networking can lead to employee collaboration in smart factories to address production issues. Hao and Helo (2017) advocate that Cloud computing facilitates workers' activities and communication while working in discrete factories. Bibby and Dehe (2018) illustrate the importance of the people factor in Industry 4.0. Zhu et al. (2018) discuss social and economic concerns while building Industry 4.0. They also suggest that fostering a strong bond between stakeholders will facilitate resource capabilities/enablers of Industry 4.0 that can overcome social and economic concerns while transforming operations into Industry 4.0. The literature explains the direct relationship between the people factor and organizational performance, but there is no evidence that states how these human factors help to gain dynamic capability, which leads to sustainable social performance. Understanding the gap, we have developed a third conjecture to establish a relationship between enablers of Industry 4.0 (Cloud ERP) and sustainable social performance.

H3. Cloud ERP services have a positive impact on the social performance of an organization.

3.1. Control variables

To analyze the differences among the organizations, we have included three control variables, i.e., firm size, cloud service offering, and cloud service type. These are specific to those firms who have adopted systems and successfully implemented Cloud ERP in their daily operations. These variables, identified from the available literature, suggest their potential impact on organizations' sustainable performance.

3.1.1. Firm size

For this study, we consider employee strength and revenue generated as two parameters for assessing organizational size. According to Rogers (1983), large organizations often incline toward fostering innovation and continuous change. Organizations adopt adaptive mechanisms that successfully monitor the current set of facilities and systems. Large scale organizations can withstand implementation hurdles because of their size, but smaller organizations do not have the leisure to make dynamic/radical changes. For them, survival is the most immediate concern, and therefore, any misconduct in ERP implementation decisions has direct repercussions on their business commitments to customers and suppliers. Organizational size is an important variable that can control the overall performance.

3.1.2. Cloud service offering

Zhang, Cheng and Boutaba (2010) describe cloud computing as "a service-driven business model," where services, either hardware or platform, are provided on-demand. Cloud-based services (Sultan, 2010; Zhang et al., 2010) can be categorized into three types:

Software-as-a-Service (SaaS): This service delivers applications via the internet, where instead of installing and maintaining the software in the premises, the application is accessed using the internet. This service reduces the complexities of hardware and software management. Here, the service provider is the one that hosts, operates, manages, and provides support for both software and the data. It also allows the end user to access the service from anywhere in the world. Some examples of SaaS include G-Apps by Google, SAP Concur, and Salesforce.

Platform-as-a-Service (PaaS): Successfully implementing software needs a computing model, which requires hardware, a database, development tools, middleware, web servers, and other supporting software, including the necessary personnel to perform the operations. With cloud computing, these services are provided by the cloud service provider. Examples of PaaS include Apache Stratos, Microsoft Azure, and AWS Elastic Beanstalk.

Infrastructure-as-a-Service (IaaS): IaaS provides on-demand infrastructural requirements including remote delivery of computer infrastructure, such as virtual systems, servers, and storage, etc., via the internet. Customers do not need to have operational expertise for the required infrastructure support. Some examples of IaaS include Amazon Web Services (AWS), Google Compute Engine (GCE), Joyent, etc.

Organizations are often skeptical when choosing the right services. One wrong selection could lead to non-compliance with existing organizational resources and technological facilities. Therefore, it adds up to a crucial control variable that might affect sustainable performance.

3.1.3. Cloud service type

It is essential for an organization to consider the need for the migration — whether it is lowering operation costs or obtaining higher reliability/security, etc. before moving to the cloud (Zhang et al., 2010). Therefore, Rani, Rani, & Babu, 2015) categorize types of deployment models for cloud-based services as below:

Public Cloud: When the cloud service provider offers a complete cloud infrastructure to the general public or to a significant organizational group, which includes a pay-per-usage model. The resources are provided to users on a dynamic demand basis.

Private Cloud: Developed specifically for a particular organization, this type of cloud exists strictly for a single organization, although cloud services can be built and managed either by the organization or the external service provider.

Hybrid Cloud: As the name implies, a hybrid cloud consists of both public and private cloud-based models. The need for such a model is to overcome the limitations of each particular approach. Some components in this model can be implemented over a private cloud, where the need for security and control is higher, and some can be implemented over a public cloud, each one linked with another via standardized technology.

Community Cloud: The infrastructure in this type of cloud is shared by various organizations and supports their common concerns, such as security requirements, policies, compliance considerations, etc. Different types of cloud services demand a specific set of organizational resources and can influence performance. It indeed plays the role of a control variable for an organization.

4. Research design

4.1. Instrument development

We have used the survey-based technique to collect the primary data. An online-questionnaire was employed, and the respondents from diverse working domains were considered for the data collection. Data was collected for the year 2018, and it is a cross-sectional study. For this particular research, we used a 5-point Likert scale comprised of strongly disagree (coded as 1), disagree (coded as 2), neutral (coded as 3), agree (coded as 4), and strongly agree (coded as 5), after understanding that two consecutive parameters had the same distance between them (Hair, Anderson, Tatham, & Black, 2005; Kock, 2015; Kock & Verville, 2012). The instrument was pre-tested with 25 respondents to confirm internal validity, reliability, and appropriateness of the questionnaire.

4.2. Sample design and data collection

The data was collected from small, medium, and large technologically advanced organizations in northern India that have diverse working personnel from all other regions as well. The data was collected from February through November 2018. The considered organizations are the multi-national companies (MNCs) based in India with uniform business operations throughout the globe. The questionnaire was circulated to 1100 respondents, and 290 fully-filled questionnaires were received. These 290 returned responses were evaluated and examined, and a total of 209 questionnaires were deemed usable. The response rate was 19 % of the total respondents targeted. There was no missing data, zero variance, or rank-related problems, and after pre-processing, the data was standardized.

4.3. Non-response bias testing

Armstrong and Overton (1977) suggest employing the wave technique to test the non-response bias. We divided our data into two sets, the first set comprised of data from the early-wave, and the second set comprised of data for the late-wave. Since we had 209 responses, the data for early-wave consisted of 104 responses, and data for late-wave also consisted of 104 responses. We performed the *t*-test for each indicator for the early and the late wave, and there were no statistically significant differences between the two waves. The test suggests that non-response bias is not a concern for us to undertake the data analysis.

Table 1
Age group of employees and their educational qualifications.

Age-Group (in years)	Graduate	Post-Graduate	Ph.D.	Total
20 – 30	41	63	–	**104**
31 – 40	25	54	3	**82**
41 – 50	10	10	2	**22**
51 – 60	–	1	–	**1**
Total	**76**	**128**	**5**	**209**

4.4. Demographic profile of the respondents

Respondents with diverse academic qualifications were clustered into four age group categories (20–30, 31–40, 41–50, and 51–60). Table 1 below shows the different age groups and their qualifications. Approximately 50 % (104) of the respondents belonged to the young cluster of 20–30 years age group, while 39 % of respondents were from the 31–40 age group (39 %). 61 % (128) of the respondents had a post-graduate qualification, whereas only 5 % (5) of the respondents in the age groups 31–40 and 41–50 had a Ph.D.

In an organization, employees have varied experiences in their respective work domains. Table 2 below gives us a glimpse of the respondents' work domains and their several years of work experience. The domain of work is classified into nine different categories, as shown in Table 2. The majority of respondents, 31 % (65) out of total 209 respondents, belonged to the 'IT Services/Software' domain, and 2 % (5) of the total respondents worked in the 'Food & Beverage' work domain. Out of 209 respondents, 31 % (64) had more than ten years of work experience, out of which 34 % (22) were from 'IT Services/Software' work domain. Most (164) of the respondents (78 %) in total had experience of more than three years.

The firm size (number of employees) usually varies according to the scale of the operations, as do the roles given to their employees. This study follows the classification of organizations termed in a report by the International Finance Corporation (2012). Micro organizations have less than ten employees. Medium and small organizations have 10–300, and large organizations have more than 300. Table 3 shows the strength of the organization and the roles of respondents in their respective organizations. The majority of respondents, 37 % (78) respondents were managers/senior managers, followed by 20 % (41) being engineers. One hundred ten respondents (53 %) worked in an organization with more than 1000 employees, whereas 6 % (13) respondents worked in an organization with less than 10 employees, out of which seven respondents were consultants.

We have considered employees performing different job roles and lying in the hierarchy of middle- or senior-level management. These personnel influence decision-making, and they play a vital role in implementing organizational strategies.

Respondents were categorized into three user categories for different types of cloud services (Cloud Service User, Cloud Service Provider, and Cloud Consultant or Researcher), given in Table 4 below. 74 % (151) used Software as a Service (SaaS) type of cloud service, whereas only 7 % (14) of respondents used Infrastructure as a Service (IaaS). 180 (86 %) of the respondents were cloud service user whereas cloud service provider and cloud consultant or researcher were at draw, with 7 % each.

4.5. Data analysis

This study follows an empirical model, where a structural equation model (SEM) is used for data analysis. Structural equation modeling has been employed for data analysis in a varied range of disciplines, such as strategic management, marketing, operation management, and psychology (Astrachan, Patel, & Wanzenried, 2014). Two types of SEM techniques are described by Hair, Hult, Ringle and Sarstedt (2013): the covariance-based (CB) structural equation model (CB-SEM) and the

Table 2
Domain of work of the employees and their work experience.

Domain of Work	Years of Work-Experience Less than 1 year	1–3 years	3–5 years	5–10 years	More than 10 years	Total
Banking/ Insurance/ Financial Services	5	5	9	9	6	**34**
Construction/ Real Estate/ Infrastructure	–	2	1	3	5	**11**
Consulting	2	8	3	4	9	**26**
Education/ Research	1	6	6	4	2	**19**
Food & Beverage	–	1	2	1	1	**5**
Government	–	–	3	2	3	**8**
IT Services/ Software	1	7	15	20	22	**65**
Manufacturing	–	2	2	6	15	**25**
Retail	1	4	3	7	1	**16**
Total	**10**	**35**	**44**	**56**	**64**	**209**

partial least squares (PLS) based structural equation model (PLS-SEM). The PLS-SEM is the most suitable technique for those studies that have a comparatively small sample size and the method of research is exploratory (Astrachan et al., 2014; Hair, Ringle, & Sarstedt, 2011, 2013; Kock, 2015; Kock & Chatelain-jardón, 2011). The efficiency of parameter estimation becomes higher while using a PLS-SEM (Hair et al., 2013). Unlike CB-SEM, which deals with factors, PLS-SEM deals with composites, which does not fully account for the measurement error (Kock, 2019). We have used factor-based PLS instead of undertaking analysis using the composite based PLS (Kock, 2019). We have used WarpPLS version 6.0 for the data analysis.

Model fit and quality indices (Kock, 2015) are shown in Table 5 below. All the quality indices, average path coefficient (APC), average R-squared (ARS), and average block VIF (AVIF) are proven significant with a P-value less than 0.001 and the AVIF as 2.813, which is both acceptable and in the ideal range (Fig. 1).

Causality assessment indices, given in Table 6 below, prove the acceptability of the research model. Simpson's paradox ratio (SPR), R-squared contribution ratio (RSCR), and statistical suppression ratio (SSR) are all within the acceptable range (0–1).

Cronbach's alpha and composite reliability are used to measure the internal validity of the scale, which has an accepted value of 0.7 or higher (Nunnally & Bernstein, 1994; Tellis, Yin, & Bell, 2009). The coefficients calculated for this study are all within the range, as given in Table 7 below. The average variance extracted (AVE) is more than 0.5 and within accepted values (Hair et al., 2005), also shown in Table 7 below. The variance inflation factor (VIF) measures the multicollinearity of the instrument, which is well within the accepted range of less than 5 (Kock & Lynn, 2012).

A discriminant validity test is used to identify the relationship between indicators and constructs, as given in Table 8. The square root of the average variance extracted (AVE) should ideally be more than the construct correlations (Fornell & Larcker, 1981).

Table 9 below gives the results and the supported and not-supported hypothesis after analysing the research model.

Now the results give a clear picture and, at the same time, confirm the conjecture we have built for this study.

5. Discussion

This section validates our research propositions. From the beginning, this study was rooted around the DCV (Teece et al., 1997) as a key to sustainable performance. Sharma and Shah (2015) advocate the implementation of Cloud ERP for improved supply chain productivity. Similarly, previous researchers (Abedi et al., 2013; Bruque-Cámara et al., 2016; Schniederjans et al., 2016; Subramanian et al., 2015; Xing et al., 2016) explore the evidence that throws light on the relationship between Cloud ERP and organizational performance. The current study not only considers the aforementioned relationship, but it also seeks to determine the critical factors for an organization to develop Cloud ERP as a dynamic resource in the long term. Also, the relationship between Cloud ERP and sustainable performance is established and empirically tested. Based on the gap in literature, we postulate three hypotheses. H1 bridges the relationship between Cloud ERP and economic performance of the firm. The finding clearly shows the positive impact of Cloud ERP, as the β value is 0.63 greater than 0.05, and the p value is less than 0.01. The integration of business processes helps the organizations to scale in an efficient manner, leading to better financial and economic performance in long run. Similarly, Hypothesis H2 explores the intrinsic relationship between Cloud ERP and the environmental performance of an organization. The findings clearly show that there is a positive impact of Cloud ERP on environmental performance, as the β value is 0.64, which is greater than 0.05, and the p value is less than .01. Cloud ERP reduces data losses, and real-time cloud operations improve processing time and reduce the misuse of resources. Hypothesis H3 focuses on the relationship between the dynamic capability of a firm i.e., Cloud ERP, and social performance of a firm. Sustainability demands credibility and can be achieved through proper practices and policies. Here, the results show a positive impact of Cloud ERP on the social performance of a firm. Mourtzis et al. (2016) advocate that smart

Table 3
Role of employee in the company/institution and the number of employees.

Role in Company/ Institution	Number of Employees Less than 10	10–50	50–300	300–500	500–1000	More than 1000	Total
After-Sales Support Executive	–	1	–	1	–	2	**4**
AVP/ VP/ EVP	–	1	4	1	2	7	**15**
Consultant	7	4	3	4	4	14	**36**
Corporate Finance Executive/ Analyst	–	2	1	2	1	11	**17**
Director/ CEO/ Founder	2	6	–	1	–	1	**10**
Engineer	1	2	3	2	7	26	**41**
Manager/ Sr. Manager	2	4	7	7	11	47	**78**
Sales/ Marketing Executive	1	–	1	2	2	2	**8**
Total	**13**	**20**	**19**	**20**	**27**	**110**	**209**

Table 4
Type of cloud services with respect to the profile of the respondent.

Type of Cloud Services	Cloud Service User	Cloud Service Provider	Cloud Consultant or Researcher	Total
Infrastructure as a Service (IaaS)	9	2	3	14
Internal Cloud	23	1	3	27
Platform as a Service (PaaS)	15	1	1	17
Software as a Service (SaaS)	133	11	7	151
Total	180	15	14	209

Table 5
Model fit and quality indices.

Average path coefficient (APC)	0.206, P < 0.001
Average R-squared (ARS)	0.437, P < 0.001
Average block VIF (AVIF)	1.057, acceptable if < = 5, ideally < = 3.3

factories should be created with a social networking framework for better organizational performance. The same is empirically tested in this research, as the β value is 0.62, greater than 0.05, and the p value comes to be less than .01. The findings not only validate our conjectures but also helps to answer the two crucial research questions. The study emerges as a valued understanding about the crucial factors required in the organization while developing dynamic capabilities. Organizational, people, and technological factors emerge as crucial resources of an organization, which complements the process of nurturing dynamic capability. Answering our first research question, these factors were found to be the most instrumental in implementing Cloud ERP in such a way that it becomes a distinctive capability for an organization. Also, due to these paramount factors, Cloud ERP can be transformed into dynamic capability and lead to a higher level of sustainable performance, as related to economic, environmental and social performance. The findings also positioned an understanding while addressing the second research questions, i.e., Cloud ERP is positively related to triple bottom line performance if nurtured and complemented with other crucial organizational, people, and technological factors. Now with this finding, research literature is enriched by the evidence that organizational, people, and technological factors can be bundled to develop dynamic capability; secondly Cloud ERP has a positive impact on the triple bottom line of organizational performance. The rest of this section is covered in two parts, explained in terms of theoretical contribution, which is a significant addition to the existing academic literature that helps to create a clear understanding of a concept by filling the gap in the literature. Also, it gives scholars a new direction to take up future research. The second part, the managerial contribution, is where practitioners follow the path of tested knowledge and create a whole new arena of possibilities. This study gives a significant and noticeable managerial implication that helps the organization to understand the importance of organizational resource with the market's overall performance.

5.1. Theoretical contributions

This study focuses on the importance of resources bundled by the organizations to build robust and distinct capabilities, which makes the system responsive enough to face the ever-changing market environment. Due to limited literature, few scholars in the past provided a roadmap for organizations to design and structure their internal and external capabilities. Until now, it has not been clear whether factors for Cloud ERP (organizational, people, and technological factors), if structured properly, could lead to successful employment of cloud-based operations/Cloud ERP, and the same is evident in recent research (Kumar et al., 2014), which states the importance of sustainable layout for using the cloud service approach. Organizational capabilities classified by Gupta and Misra (2016) expand the literature while focusing on functional capabilities of the organization. On the other hand, Gupta et al. (2018) provide the importance of Cloud ERP to achieving organizational performance. Giannoccaro (2018) made progress while discussing cognitive analytical skills, a crucial aspect of managerial skills required by the decision makers to develop dynamic capabilities, which helps to build lexicon, specifically in similar functional industries, but somewhere neglecting the organizational and technical factors. Gupta and Misra (2016) classify three major factors, i.e., technical, people, and organizational factors to achieve organizational performance. Past scholars (Demirkan et al., 2010; Duan & Liu, 2016; Helo et al., 2014; Radke & Tseng, 2015; Schniederjans et al., 2016; Subramanian et al., 2015) study the possible relationship between Cloud ERP and overall

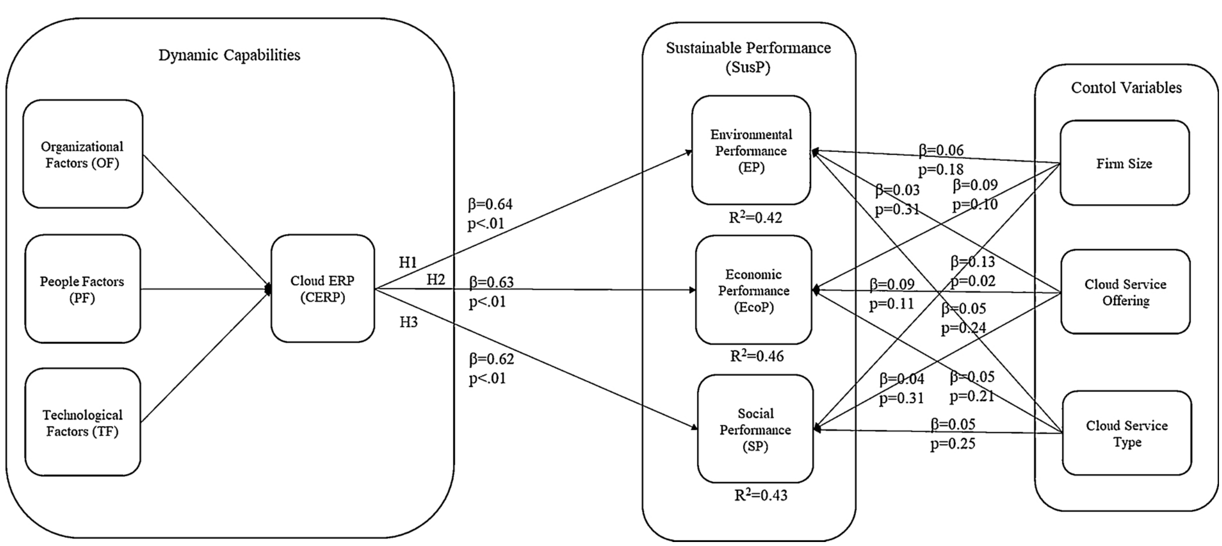

Fig. 1. Theoretical Model with PLS-SEM Analysis.

Table 6
Causality Assessment Indices.

Simpson's paradox ratio (SPR)	0.750, acceptable if > = 0.7, ideally = 1
R-squared contribution ratio (RSCR)	0.990, acceptable if > = 0.9, ideally = 1
Statistical suppression ratio (SSR)	1.000, acceptable if > = 0.7

Table 7
Latent variable coefficients.

	CERP	EP	EcoP	SP
R-squared coefficients	–	0.42	0.463	0.427
Adjusted R-squared coefficients	–	0.409	0.452	0.416
Composite reliability coefficients	0.955	0.927	0.904	0.925
Cronbach's alpha coefficients	0.954	0.926	0.903	0.926
Average variances extracted (AVE)	0.554	0.759	0.702	0.756
Variance inflation factors (VIF)	2.075	3.03	3.066	3.664

Table 8
Correlations among latent variables with square root of AVEs.

	CERP	EP	EcoP	SP
CERP	0.745			
EP	0.654	0.871		
EcoP	0.664	0.71	0.838	
SP	0.63	0.788	0.778	0.87

Note: Square roots of average variances extracted (AVEs) are shown on diagonal.

organizational performance. But there are no studies which empirically validate the above relationship. Past research (Abedi et al., 2013; Bruque-Cámara et al., 2016; Schniederjans et al., 2016; Subramanian et al., 2015; Xing et al., 2016) states that Cloud ERP catalyzes the process of supplier integration, leading to a firm's greater financial, operational, and environmental performance, but at the same time, fails to establish any tangible relationship between organizational capability and the triple bottom line of performance. The most significant relationship was established by Dubey, Gunasekaran, Childe, Papadopoulos et al. (2019); Dubey, Gunasekaran, Childe, Roubaud et al. (2019) who link organizational capabilities with financial and operational performance under the RBV. Martin and Bachrach (2018) argue that dynamic capability helps firms in networking, which affects overall performance, but no dimensions of overall performance are discussed in the literature. This study follows the seminal line of thoughts, but more specifically, while connecting dynamic capability of an organization with the dimensions of sustainable performance. The finding of the study expands the literature in terms of projecting a clear importance of bundling strategic resources while nurturing dynamic capability. Adding a new horizon to the available studies with respect to cloud computing and DCV, this particular research helps establish an evident positive impact of Cloud ERP on firm's performance. Under the RBV, firms can achieve higher sustainable performance in all the three fronts, i.e., economic, environmental, and social performance, breaking the myths of the high cost and high failure rate of cloud-based services.

5.2. Managerial implications

Organizations understand the importance of data and its utilization. Firms often focus on acquiring the latest technology in tech-driven operations, but they do not optimally leverage them in a competitive environment. This study consolidates the segmented factors (organizational, people, and technological factor) provided by past researchers (Schoenherr, 2012; Zhu & Sarkis, 2004; Zhu et al., 2005; Zsidisin & Hendrick, 1998). The findings of this study paint a clear picture of the importance of acquiring and nurturing resources and transforming them into dynamic capabilities. The empirical investigation shows the positive relationship between resource capability and sustainable performance of an organization. The results clearly depict that the employment of Cloud ERP efficiently channels operations while achieving sustainable performance in longer run, although organizations often improperly identify crucial factors before of Cloud ERP implementation. The current research helps identify these factors for developing a robust and efficient Cloud ERP operation, which can independently impact the environmental, economic, and social performance. The overall image of an organization is scaled by these dimensions and now with the results of this study, it is quite evident that a successful deployment of Cloud ERP can significantly enhance its threshold. As the model shows the interlinkages between firm-size, cloud service offering, and cloud service type, it is now more prominent that these variables should not be ignored, as they have significance while achieving sustainable performance. The results of our study help managers who face non-productive operations even after investing a considerable amount in building resource capabilities but did not know to orient the capabilities. Firm size has limited effect on social performance, but cloud service type and cloud service offering have no impact on sustainable performance. Results of this study show that organizational dynamic capability (tangible as well as intangible) plays a significant role in achieving a state of sustainability in performance, so it hints that the decision makers should plan ahead for crucial listed factors and then disburse the business decisions. Our results further assist managers in giving equal weight to environmental, economic, and social performance of an organization because it leads to sustainable performance. Managers must think of a way that their organizations can achieve a respectable economic performance while upgrading their environmental and social performance with the help of technology upgradations like Cloud ERP after leveraging their dynamic capabilities.

6. Conclusion

In this paper, authors have presented their viewpoint on overall organizational performance after developing cloud ERP as their dynamic resource. Also, this study advocates that organizations should strategically acquire their resources so they can be pooled in a way that develops dynamic capability for greater sustainable performance. The

Table 9
Results of hypotheses testing.

Hypothesis	β and p-value	Supported or Not-Supported
H1: Cloud ERP services have a positive impact on the economic performance of an organization	$\beta = 0.63$ $p < .01$	Supported
H2: Cloud ERP services have a positive impact on the environmental performance of an organization	$\beta = 0.64$ $p < .01$	Supported
H3: Cloud ERP services have a positive impact on the social performance of an organization	$\beta = 0.62$ $p < .01$	Supported

triple bottom line requires overall growth in all the three surfaces i.e., economic, social, and environmental performance, which can be acquired by deploying Cloud ERP. Also, a strong evidence is developed which shows that the success of Cloud ERP or development of any dynamic resource is also dependent on firm size, cloud service offering, and cloud service type, which can typically act as control variables regulating the organization. The dynamic resources can help the organization to sustain in case of disruption and help to navigate uncertainties. The use of cloud-based services not only attracts industries but also opens up new challenges and dilemma in their deployment. This study can help to organizations understand how to strategically acquire resources and leverage them while developing dynamic capability at the organizational level.

7. Limitations and future scope of research

Though this study investigates new dimensions of organizational resources, it also faces some limitations. One of the first limitations is that the data is gathered in a single point of time, which can be further studied by collecting longitudinal data. A longitudinal study will enrich our understanding of the causal relationships between the constructs and help reduce common method bias studied by Guide and Ketokivi (2015), which disrupts the study by getting data from a specific source at a single point of time.

Secondly, the current study focuses on organizations that are technologically advanced in their operations and can quickly adopt ERP services and nurture their environment. There is a more significant challenge for those organizations that are not as technically competent and are skeptical between building and outsourcing the facilities. Also, their long-term motivation differs with the choice of building or outsourcing the organizational resource. It would be interesting to see how human capital working in non-high-tech organizations will complement or create constraint in Cloud ERP capabilities.

Finally, the demographic constraint of the sample did not allow for generalizing the findings. The data collected for this study is from an emerging economy (India), and it would be noteworthy to identify the comparison in the results if data is obtained from organizations of a more developed economy. The same result can be applied to the organizations of an advanced economy, and it would be interesting to study the degree of effect of market performance on the relationship between organizational capability and sustainable performance. Hence, we appreciate and encourage future research to include more data samples from diversified industries operating in distant geographical locations. Scholars can expect to get more robust results for longitudinal data sets.

Table A1
Operationalization of Constructs.

Latent Variable	Indicator	Measurement Constructs
Organizational Factors (OF) (Gupta & Misra, 2016)	OF1	Strategic Goals & Objectives
	OF2	Communication
	OF3	Implementation Strategy
	OF4	Business Process Re-engineering
	OF5	Project Management
	OF6	Project Budget
	OF7	Organization Resistance
People Factors (PF) (Gupta & Misra, 2016)	PF1	User Involvement
	PF2	Selection of Vendor
	PF3	Project Team
	PF4	Training of User
	PF5	Trust on Vendor
Technological Factors (TF) (Gupta & Misra, 2016)	TF1	Selection of ERP Package
	TF2	IT Infrastructure
	TF3	Data Integrity and System Testing
	TF4	Functionality
Sustainable Performance (SusP) (Schoenherr, 2012; Zhu & Sarkis, 2004; Zhu et al., 2005; Zsidisin & Hendrick, 1998)	Environmental Performance (EP)	
	EP1	Cleaner Production
	EP1	Industrial Ecology
	EP1	Green Supply Chain Management
	EP1	Sustainable Growth
	Social Performance (SP)	
	SP1	Ethical Commitment
	SP2	Social Benefits of Investments
	SP3	Social Network
	SP4	Societal Obligations
	Economic Performance (EcoP)	
	EcoP1	Infrastructures and Stakeholders
	EcoP2	Stakeholder Obligations
	EcoP3	Capital Project Performance
	EcoP4	Just-In-Time Practices

Table A2
Combined loadings and cross-loadings.

	CERP	EP	EcoP	SP	Type	SE	p-value
OF1	0.772	0.244	0.075	−0.22	Reflective	0.06	< 0.001
OF2	0.767	0.26	0.101	−0.372	Reflective	0.06	< 0.001
OF3	0.765	0.036	−0.026	−0.075	Reflective	0.06	< 0.001
OF4	0.751	0.044	−0.021	−0.166	Reflective	0.06	< 0.001
OF5	0.773	0.136	−0.024	−0.077	Reflective	0.06	< 0.001
OF6	0.723	−0.021	−0.126	0.004	Reflective	0.06	< 0.001
OF7	0.784	−0.016	−0.085	0.004	Reflective	0.06	< 0.001
PF1	0.755	−0.18	0.222	−0.052	Reflective	0.06	< 0.001
PF2	0.76	−0.174	0.045	0.115	Reflective	0.06	< 0.001
PF3	0.764	−0.308	−0.052	0.295	Reflective	0.06	< 0.001
PF4	0.776	−0.168	0.119	0.15	Reflective	0.06	< 0.001
PF5	0.782	−0.045	0.05	0.015	Reflective	0.06	< 0.001
PF6	0.765	−0.166	−0.093	0.107	Reflective	0.06	< 0.001
TF1	0.717	−0.061	−0.03	0.017	Reflective	0.06	< 0.001
TF2	0.584	0.181	−0.066	−0.155	Reflective	0.062	< 0.001
TF3	0.713	0.09	−0.233	0.002	Reflective	0.06	< 0.001
TF4	0.681	0.037	−0.156	0.078	Reflective	0.061	< 0.001
EP1	−0.071	0.843	0.025	−0.043	Reflective	0.059	< 0.001
EP2	−0.046	0.901	−0.074	−0.168	Reflective	0.058	< 0.001
EP3	−0.093	0.871	−0.078	−0.106	Reflective	0.059	< 0.001
EP4	0.062	0.87	0.015	−0.116	Reflective	0.059	< 0.001
EcoP1	−0.108	−0.024	0.836	0.099	Reflective	0.059	< 0.001
EcoP2	0.017	−0.275	0.84	0.186	Reflective	0.059	< 0.001
EcoP3	−0.088	0.089	0.86	−0.258	Reflective	0.059	< 0.001
EcoP4	−0.058	0.08	0.814	−0.41	Reflective	0.059	< 0.001
SP1	−0.036	0.012	−0.019	0.858	Reflective	0.059	< 0.001
SP2	0.019	−0.12	−0.171	0.918	Reflective	0.058	< 0.001
SP3	−0.092	-s0.076	−0.093	0.85	Reflective	0.059	< 0.001
SP4	−0.05	−0.054	−0.026	0.851	Reflective	0.059	< 0.001

Note: Loadings are unrotated and cross-loadings are oblique-rotated. SEs and p-values are for loadings. P-values < 0.05 are desirable for reflective indicators.

Appendix A

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