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DEVELOPING FOW EMPLOYEE COMPETENCE FOR INDIA: EMPLOYER AND EMPLOYEE

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Abstract: In recent years, digital technology has disrupted one industry after another, and it is rapidly transforming how people communicate, learn, and work. Experts and researchers describe the technological progress in this digital era as exponential, digital, and combinatorial. Exponential is increasing betterment and inappropriateness of past to future; Digital is the conversion of any data into bits understood by computers and combinatorial means each development becomes a building block for future innovations. Human resources development needs to take cognisance of the unique challenges that the workplace of the future characterised by digitalisation and virtualization so that young people can be prepared adequately for the workplace. Defining it as a radical change in the Indian scenario which finds a number of companies in the digital, virtual space of creating, delivering products and also offering services, it is a fertile ground for a meaningful exploration as a FOW concept.

In this context, the proposed study conceptualises FOW based on literature under six domains – impact on business and the organisation, impact on work and the worker, characterising FOW competence and dynamics of developing this from an employer, employee and the employer-employee side. The objectives of the study based on research gaps identified are to identify key characteristics of organisational adaptation mechanisms in the Indian FOW context and explore various inter-firm and intra-firm collaborations. Within this context, an attempt will be made to define what FOW competence is and how it can be developed with the employee and employer as partnering agents. The methodology is mixed, with a qualitative and quantitative focus depending on the scope. LFI and social constructivism will be a framework to explore. The study will be useful in the Indian context to make some sense of the rapidly changing scenario and coping required in the digital and virtual work in Indian organisations. A framework for development and training on FOW employee competence is a plausible outcome of the study.

Keywords: FOW concept, employee competence, social intelligence, cross cultural competency, computational thinking, trans disciplinarily, FOW employee competency,

Introduction

It is an IOT world today. As on 2018, the estimated number of people who access the internet in India is around 500 million (TOI, 2018) According to a study conducted by Nokia; the average American smartphone user checks their phone every six and a half minutes, or up to 150 times per day (Spencer, 2013). Brynjolfsson and McAfee (2014) encapsulate the technological progress in the digital era as exponential, digital, and combinatorial. Exponential is increasing betterment and inappropriateness of past to future; Digital is the conversion of any data into bits understood by computers and combinatorial means each development becomes a building block for future innovations. Within the next decade, the Cloud will enable instant access to the digitalised knowledge of the world through any Internet-capable device potentially anywhere in the world. The world is rapidly changing due to breakthroughs in Internet and Communication Technologies, the ICT and other developments like Artificial intelligence, Big Data, Virtual Reality among others. Everything seems to be just the press of a few key buttons away, on the smartphone or just wearing smart glasses or a gadget.

Unlike older technologies, which mostly produce fixed physical outputs, digital technologies are generative (Zittrain, 2006) – they can be combined and recombined endlessly for fresh purposes (Arthur, 2009). The domain of digital technology includes computer hardware, software, transmission networks, protocols, programming languages, very large-scale integrated circuits, algorithms, and all the components and practices that belong to these various technologies. In recent years, digital technology has disrupted one industry after another (Christensen, 1997), and it is rapidly transforming how people communicate, learn, and work. The information culture is based on four-principles: *instantaneity* (Real-time virtual interaction, fast-paced flow of data, and instant access to electronic information), *interactivity (*free, open and exchange of information), i*nformality* (freedom to work at any time from any place) and *intangibility* (colleagues whom we may have never met and who may be far away) (Khan & Azmi,2005). Due to these rapid changes, organisations and the world of work and the worker are changing in this digital age. The use and control of IT provides an opportunity to be innovative in when we work, where we work and the way we work : time, place and space (Harvey, 2010), Supported by cloud-based information and communication technology (ICT) tools and practices, co-working arrangements are further linked to technologically-mediated work practices (Ross & Blumenstein , 2014).

Virtual offices are a growing trend in today's work environment and are expected to influence marketing roles dramatically, especially selling. Marshall et al., 2007. It is expected that 90 million Americans, representing about 45% of the workforce, will be engaged in some virtual office arrangement by 2030 (Kepczyk, 1999). There is potential for greater global telework access which can deliver 'smart' outcomes, such as higher productivity, commitment, engagement, productivity, and better work-life balance for multiple stakeholders (Peter et al., 2016). Many companies have acquired firms abroad or set up their own offices in foreign countries to which they send work in knowledge-intensive occupations, such as IT service, software engineering, product development, accounting, and graphic design (Urry, 2014). Geographical dispersion of employees and locations has led to different models like *Working from Home* in which there is virtual collaboration with other affiliated members of the organization, *Coworking* in which there is a centre to collaborate for other cowork centre members who are unaffiliated to the worker's organisation) as well as *Working in an organisation's central workplace* in which face-to-face collaboration happens with affiliated members of the worker's organization (Ross, 2015).

Human resources development needs to take cognisance of the unique challenges that the workplace of the future is posing to individuals so that young people can be prepared adequately for the workplace (Cooper 2006). Right in 2004, Jonathan.M (2004), in his article on the future of work had commented that India and China, two countries with vast populations would have dramatic changes to organisation and industry in terms of the impact of internationalisation and globalisation upon firms and consequently labour and the impact of communication technology. Future of Work (FOW) as a phenomenon is a vibrant area of study in India. In the Indian scenario, we find a number of companies in the digital, virtual space of creating, delivering products and also offering services. Hence, it is a fertile ground for a meaningful exploration of Future of Work, FOW as a phenomenon on which we need to raise a number of questions for which we need also quickly to seek answers and solutions.

Review of literature

This section consists of six sections: 1) Impact on business and the organisation 2) Impact on work and worker 3) FOW employee competence 4) Developing FOW competence: The Employer side 5) Developing FOW competence: The Employee side and 6) Developing FOW competence: The Employee & Employer side

1. **Impact on business and the organisation**

Quoting a few business leaders' viewpoints, Victor (2016) points out that the built to last business model is now out of step with digital reality. Sustainable competitive advantage has given way to the more contemporary concept of business agility. Research shows that the digitization of work creates data, information, and visibility into others' tasks that can lead people to make connections between, and combinations of ideas that result in new products, processes, or services (Leonardi, *2017)* The digitization of society is affecting customer needs, product and service properties, delivery mechanisms, and organization design (Snow et al, 2017). *Products as services* is a business model that is growing in many arenas (Porter and Hempelmann, 2014).

Kugler *2017*, a technology writer, asserts that VR (virtual reality) and AR (Augmented Reality) are poised to transform how we *work*. To connect to coworkers and peers in highly realistic virtual or virtually augmented environments—a more immersive, versatile, and natural way to get business done in a virtual world instead of desktop interfaces or pinging phone apps in contexts like customer service interactions, high technology 3D manufacturing and employees functioning in health systems. Digitally, Mckinsey Global Institute (2018) has categorised companies into Core Disruptors, Efficiency Enhancers, and Human Machine Collaborators depending on their business model and market dynamics. *Core disruptors* include software, technology, telecom and media and similar others where new technology transforms product portfolio and business model with strong overall market growth and has a requirement of the mainly high-skill workforce. E*fficiency enhancers* focus on automation for labour substitution with slow/moderate growth and will require mainly low- and mid-skill workforce including industries like Retail, Banking and insurance and labour-intensive manufacturing among others. *Human-machine collaborators* focus on automation to complement labour with a moderate/strong overall market growth requiring mainly mid- and high-skill workforce including industries like Healthcare, Advanced manufacturing and Asset management among others.

Increasingly, organisations are assessing their opportunities, developing and delivering products and services, and interacting with customers and other stakeholders digitally. Mobile computing, social media, and big data are the drivers of the future workplace, and these and other digitally based technologies are having significant economic and social impacts, including increased competition and collaboration, the disruption of many industries, and pressure is being put on organizations to develop new capabilities and transform their cultures (Snow et al., 2017). The number of people employed is now getting drastically reduced to nearly only 10% of the earlier context with robots playing a significant role in manufacturing. (Burris, 1998). As an agile organisational form (Alberts, 2007), the digital organisation will be populated with individuals and teams who are facile with technology and who can collaborate both inside and outside the organisation to make process improvements and develop new solutions.

Digital technologies, often disrupt established ways of organising and require adaptation through collaboration as well as self-organisation around situation awareness (Endsley, 2000). A fully digital enterprise is an actor-oriented organisation (Boudreau et al. 2011) that relies on protocols, knowledge sharing, infrastructure to maintain control and coordination instead of hierarchical mechanisms and a powerful combination of employees, partners, and customers who use digital tools for the co-creation and co-production of products and services as well as providing digital platforms for self-organized collaboration (Snow et al, 2017). With the declining costs of global communication and information processing, hierarchy is being replaced by radically different ways of organizing (Fjeldstad et al., 2012), through the digital elements which include cloud computing, big data analytics, cognitive computing, and collaboration platforms and artificial intelligence embedded in machinery and tools play an ever-larger role in emerging digital organizations (Kolbjørnsrud et al. 2016).

2. Impact on work and worker

ICT has made work portable, and it could be carried out on the road, from home, a customer's office, a field office or at a tele-centre (satellite office). Part-time work, temporary contract work, outsourcing, flexi work, flexi-place, flexi time, flexi hours, annualised hours, work sharing, de-jobbing, short workweeks, zero hour contracts, time accounts and compressed time options are some of the models of employment today (Khan & Azmi, 2005). Further, People will need to work with colleagues from across the world, those with very different mindsets, experiences and aspirations. Computerisation has favoured skill intensive, analytical activities like product development, quality control, design of customer services, and promotion of products by advertising campaigns. These tasks require much analytical thinking and are based on efficient flows of information about markets and customers (Grossman 2005).

Hagel (2015) describes the "open workforce" model as requiring agility, ability to act fast on opportunities and gaining competitive advantage due to globalisation and digitisation. Firms will increasingly rely on external staff as well as their permanent in-house employees to meet their business needs. The workforce is evolving into a mixture of full-time employees, contractors, freelancers, and, increasingly, people with no formal ties to the enterprise (CGMA,2015). According to Gratton 2011, there is a high value for social capital from networks and relationships within functions and businesses, across business groups and the broader community of stakeholders. Talented employees as global citizens cross borders and move to areas of skill need and growth.

Companies are increasingly responding to the challenges of the digital era by redesigning how their employees work. Omar Sawy et al. (2017) have proposed that in digital organisations the top management and all employees need to be more adaptive and willing to experiment and innovate while occasionally failing to have an adaptive skill set and digital know-how.

In Web 2.0 environments, employees of highly successful companies in the twenty-first century can create valuable information and knowledge online and communicate electronically by using various collaboration tools such as wikis, blogs, Facebook, and Twitter. Collaboration tools, like wikis, are rapid, simple, convenient, open source and easily maintainable and conform naturally to the way people think and work and have the flexibility to evolve in a self-organising fashion as the needs and capabilities of the organisation change (Tapscott et, 2008). Computerised

technology can be implemented so as to either automate or informate jobs. It can redefine jobs around more abstract skills but limited worker autonomy (Zuboff (1988). The workforce composition will shift drastically (MGI, 2018). More work will be contracted to freelancers and other contractors, boosting the emerging "gig" or "sharing" economy.

3. FOW employee competence

Briggs & Makice (2012) have recognised the term digital fluency as one of the most obvious of the competencies to be proficient and have comfort in achieving desired outcomes using technology. By 2030, according to a recent McKinsey Global Institute report, as many as 375 million workers, roughly 14 % of the global workforce may need to switch occupational categories as digitisation, automation, and advances in artificial intelligence disrupt the world of work. The kinds of skills companies require will shift with profound implications for the career paths individuals will need to pursue (MGI 2018).

The millennials of today entering the workforce in a big way have a global mindset. (Carrasco, R. 2014) In order to develop young people in the workforce, Simon Fraser University has researched and enlisted a set of required skills to thrive effectively in the workplace today. They include *Sense-making*, the ability to determine the more profound meaning or significance of what is being expressed, *Social Intelligence*, the ability to connect to others in a profound and direct way, to sense and stimulate reactions and desired interactions, *Cross-cultural Competency*, the ability to operate in different cultural settings, *Computational Thinking*, the ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning, *Media Literacy*, the ability to critically assess and develop content that uses new media forms and to leverage these media for persuasive communication, *Trans-disciplinarity*, literacy in and ability to understand concepts across multiple disciplines; *Design Mindset*, the ability to represent and develop tasks and work processes for desired outcomes, *Cognitive Load Management*, the ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques, and *Virtual Collaboration*, the ability to work productively, drive engagement, and contribute as a member of a virtual team (sfu, 2011). Further, with more organisations using firm-generated social media content to connect with customers and build their brands, employees who understand and can leverage the power of social media will also be found to be valuable to organisations (Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016).

A comprehensive research report of the Mckinsey Global Institute (MGI, 2018) has the following details. The most robust growth in demand will be for technological skills, the smallest category today, which will rise by 55% by 2030. This surge will also affect demand for necessary digital skills as well as advanced technical skills such as programming. Demand for social and emotional skills such as leadership and managing others will also rise by 24%. A set of 25 skills across five broad categories are identified: physical and manual, necessary cognitive, higher cognitive, social and emotional, and technological skills. Higher cognitive skills include advanced literacy and writing, quantitative and statistical skills, critical thinking and decision making, project management, complex information processing and interpretation, creativity and include work like preparing sales or other contracts, explain technical information to customers and maintain and manage product inventories as against basic skills like taking customer orders, provide basic information to customers and maintain operational and sales records. Social and

emotional skills include advanced communication and negotiation skills, interpersonal skills and empathy, leadership and managing others, entrepreneurship and initiative-taking, adaptability and continuous learning as well as teaching and training others. Amongst the US and UK workforce predictions, there would be a 5 to 7% increase in the need for higher cognitive skills, a reduction of 14 to 17% in basic cognitive skill requirements, an increase between 22 to 26% in social and emotional skills and a dramatic increase of around 52 to 60% of technological skills.

Professional, managerial, and technical occupations and service labour occupations fall on opposite ends of the occupational skill continuum. (Levy and Murnane, 2003). The first category includes abstract tasks that require problem-solving capabilities, intuition, creativity, and persuasion requiring inductive reasoning, communications ability, and expert mastery. The second broad category includes tasks requiring situational adaptability, visual and language recognition, and in-person interactions—which we call manual tasks. Brynjolfsson and Andrew McAfee (2014) declare that rapidly accelerating digitisation is likely to bring in economic rather than environmental disruption and the impact on the worker is to develop special skills to use technology to create and capture value which will be highly sought after. Those with ordinary basic skills can get redundant during this change.

4. Developing FOW competence: The Employer side

The digital workforce will be comfortable with technology-based instruction (Kraiger & Ford, 2007), giving organisations a low-cost, replicable solution for helping employees develop the skills that they need. As it becomes less common for teams to be co-located, organisations need employees who are proficient in using virtual collaboration tools, such as Google Drive for collaborative writing, Trello for collaborative project management, and Yammer or Slack for communication and enterprise-level social networking. With the quality of hyper-connectivity throughout the world, technologically enhanced deep skill development is predicted to happen less through traditional classroom teaching, and more through computerised simulations, e-learning and blended learning (Gratton, 2011).

Companies are increasingly responding to the challenges of the digital era by redesigning how their employees work. They promote digital workplaces which are the physical, cultural and digital arrangements that simplify working life in complex, dynamic and often unstructured working environments. The digital workplace capabilities are classified into two dimensions with three levers each. One is connectedness (space, system and social) which refers to the extent to which employees can engage with each other, with stakeholders and customers, with information and knowledge, and with ideas. The other is responsive leadership (leadership, systemic learning and symbols) refers to the extent to which management prioritises the activities that focus on the development and continuous improvement of employee experience in the organisation (Dery et al. 2017).

A McKinsey survey report of 2017, polled more than 1,500 respondents from business, the public sector, and not for profits across regions, industries, and sectors and found that investing in retraining and "upskilling" existing workers is seen as an urgent business priority. Companies are to provide continuous learning options and instil a culture of lifelong learning and encourage a strong shift toward cross-functional and team-based work, more agile ways of working with less hierarchy,

with altered allocation of work, new business units and work being unbundled and rebundled to utilise different competences and qualifications of the workforce. (MGI,2018)

Omar Sawy (2017) observes that Companies invest in building digital competencies through boot camps collaborating with external partner with an intent to educate on new digital trends as well as the organisational, cultural, ecosystem, partnering and customer challenges of digitalisation. Companies can encourage a culture of collaboration and experimentation, training employees to accept failures, making them comfortable with changing tasks and assignments quickly and flexibly, working on locational and time flexibility, investments in digital platform capabilities for remote work, make information available through multiple and mobile devices, hire more of digital generalists who are quick to adapt to changing contexts and a constant endeavour to monitor and improve the digital quotient of the workforce.

5. Developing FOW competence: The Employee side

Cooper (2006) summarises on the characteristics of the employees in the workplace of future. They are the need to be passionate about change, being totally adaptable, the ability to cope with the stress and frustration that accompanies chaos, the ability to creatively and innovatively seek and create opportunities as well as a willingness to embrace risk in order to pursue such opportunities, capable of imaginatively spotting new opportunities as they arise, capitalize on them and move on to the next opportunity, to be increasingly assertive, confident and self-accepting and to know oneself, one's strengths, weaknesses and goals, feel competent and well-liked by others as well as qualities of integrity, authenticity, honesty and consistency in managing networks and relationships. In a world requiring competence in relationship building, traits like kindness, internal motivation, pro-activeness as well as the ability to inspire and motivate others and a continuous drive for learning and self-development and an investigative, inquisitive and creative approach to everyday tasks and challenges is deemed important.

Some of the dimensions of Individual Virtual Competence address the cognitive, technical, and social challenges raised (Wang, 2009). The identified components of competence in the digital world are *virtual self-efficacy,* which describes an individual's belief in his or her abilities to use information communication technologies and accomplish work tasks virtually This comprises of *computer self-efficacy* and *remote work self-efficacy* which refers to an individual's belief in his or her ability to work and perform joint tasks with others in virtual settings; *Virtual media skill* describes an individual's skill level in using technologies to communicate in virtual settings to their full potential; and *Virtual social skill* reflects the individuals' understanding of the uniqueness of social activities in virtual settings and the skill to deal with it.

6. Developing FOW competence: The Employee & Employer side

Typical characteristics of virtual organization are boundary-crossing where organizations "unite" to deliver desired products in changing business environment (Jagers, 1998), complementary core competencies of entities to enable delivery of improved products; geographical dispersion, which is partly overcome by the use of ICT, changing participants involved in project-based tasks; Participant equality, trust over hierarchy; and electronic communication. They are often defined as network organisations created by pooling independent enterprises- organisations, companies, institutions or specialised individuals that unite "to exploit an opportunity together" (Fuehrer, 2001). There can be differences between partners and employees, differences in culture

which has implications on effective communication. Self-motivation, independence & confidence, comfort with solitude, self –motivation, level of job knowledge and skills, independence & confidence, comfort with solitude, time management & organisational skills, communication skills, trustworthiness and reliability, accountability and interpersonal trust are important (Chai et al., 2013). The concept of virtuality is embedded in the concept of different types of discontinuities embedded in temporal work location, geographic work location, workgroup membership, projects/tasks, cultural backgrounds and organisational affiliations (Watson-Manheim et al., 2002)

Crossan, Lane, and White (1999) provide a useful framework for understanding the path of learning from the individual to organisational level, as it seems that both the employer and employee need to participate as partners in developing FOW competence. They conceptualize four phases in organizational learning: intuiting – the process of individuals developing insights and ideas based on their experience, interpreting – individual employees explain the idea to themselves or to other group members, integrating – the idea is translated into action conducted at a group level, and institutionalizing – the process whereby the idea is implemented in the organization's processes and practices. The workplace environment can provide rich opportunities for informal learning like creating new modes of action, new practices, new processes and products both individually or in groups as it is characterised by contextual reasoning and produces implicit and tacit knowledge as well as situation-specific competences (Paivi, 2008).

Formal learning does not work anymore. This kind of learning is effective only 10 or 20 % of the time to gain knowledge people need at their workplaces. The overall 80% are covered by informal learning activities on the workplace (Cross, 2007). Informal learning enables people to cope with situations and problems occurring in their daily work practice. To comprehend such ways of learning, the concept of connectivism is useful (Siemens, 2005). In any new situation, learning is greatly an ability to connect to different 'nodes' of knowledge, which are spread over a network of data, information and people and is called 'connected knowledge' This implies that learning does not take place inside a learner, but is a social process of exchange and externalization. Learning from Incidents [LFI] (Lukic, Littlejohn, and Margaryan 2012) is also a useful framework as a lot that needs to be learnt and developed among employees is no longer curriculum or subject-based; it is all about being able to do something (Gilmore, 2010). Learning and decisions are often occurring in real time, and researchers have emphasised that it is necessary to move beyond the *linearity* metaphor to *simultaneity* which requires instant integration and convergence of ideas and information. Single-loop learning can reduce the reoccurrence of simple incidents (Snowden 2002). However, most incidents are complex and are triggered by complex underlying factors, which are frequently omitted from incident investigation considerations. Therefore, an essential element of double-loop LFI is the engagement of employees at both individual and organisational levels (Koornneef, 2000). Knowledge is distributed across the organisation: the knowledge required for specific work processes is distributed across those employees who are closely working within the processes. Problems arise if learning remains at the individual level when the organisation is not learning from specific incidents; it leaves the organisation vulnerable to the reoccurrence of similar incidents. Input from these individuals is invaluable in terms of identifying potential faults and solutions that need to be aligned with practice. By drawing on the knowledge of these distributed

individuals, different areas of the organisations can combine their knowledge to contribute towards LFI. Therefore, decisive engagement with LFI requires individual agency (Billet, 2002).

Individual agency in LFI depends on individual and organisational factors (Fuller and Unwin 2004). The quality of learning at work is a product of both workplace conditions and individual engagement, and these two are interrelated (Dane Lukic, 2013). As Billett (1996) observed, Individual agency mediates engagement with activities and what is learned through participation, and it represents an interaction between 'how' the workplace affords participation and individuals engage in that social practice. When companies recognise and give importance to individual agency in LFI, and are more accommodating to instances where employees exercise their individual agency it increases future motivation through valuing employee contributions and giving meaningfulness to individual input. Employees can contribute more and develop themselves better.

More recent studies acknowledge the interplay of both individual and organisational factors. From this perspective, an individual is no longer the sole purveyor of knowledge, rather learning is viewed as being distributed across organisational structures and artefacts, as well as between individuals (Elkjaer and Wahlgren, 2006). Individual agency is organised by enabling participation and is influenced by structural empowerment and psychological empowerment. Structural empowerment would be the perception of the presence or absence of empowering conditions in the workplace. Psychological empowerment is the employees' psychological interpretation and reaction to these conditions (Bhatnagar, 2007).

From this section, it can be inferred that development of FOW competence is to be understood contextually, with participation from the company and employees. It will be useful to study the process of how this phenomenon manifests.

Research gap

Based on the review of literature, the need for further research can be emphasised.

Technology has helped business control time of creation and execution of products and ideas across geographies. The impact on companies and work is about the search for a competent workforce who work in virtual teams, do telecommuting, are technologically competent on data enabled through cloud-based work systems. To manage all this poses a large challenge for the HRD professional (Li, 2016). Therefore, research on this will add value.

The growth of alternative workplaces further implies how managing workforces in this changing context requires firms to increasingly manage complex geographically diverse and technologically mediated workplace relationships, including in-house, self-employed, regionally-based and offshore workers (Ross & Blumenstein, 2013). It further points to the need for more research into these changing workplace patterns.

In spite of a range of tools to learn technology, more of skill sets required for the digital age have to be identified (MGI,2018). Trying to explore what this FOW competence is and how to develop this based on a partnering by the employer and employee is a relevant challenge today.

Does one learn in the same way throughout one's life? This question is especially important since, in today's world, careers are increasingly segmented owing to the many technical and organisational changes that occur in companies, and which call into question their employees' acquired skills. Know-how that has been acquired through experience is rarely considered as a foundation on which to build the new learning, but rather as a handicap (Barriellia,2012). This stresses the importance of understanding the *process* and *content* of changing FOW competences in an evolving scenario.
Virtual work is an emerging and growing component of the day-to-day work of almost all knowledge workers (Townsend et al., 1998). Prior research on competence has theorised that competence generally consists of multiple components, such as a cognitive component, a skill-based component, and an effective component (Kraiger et al., 1993). The composition of individual knowledge, skills, and abilities (KSAs) required to work virtually would benefit from further research (Wang et al., 2011).

Individual competence is context specific, because different contexts may require different sets of ability, motivation, skill, and knowledge (Wang et al., 2011). This stream of research requires study of the context within which the competence is deployed in order to derive its appropriate components relevant for that context. Contributions to competence research emerge from systematically defining new, relevant contexts and new types of competence that add to the choice set, which researchers can use to study individual-level phenomenon. There is a need to understand the organisational context and the role of others.

One observation on research paradigms point to technological change on the organisation of production in favour of contextualist or contingent approaches, that emphasises the need to explore the microdynamics of workplace changes (Burris,1998). This is an interactive context with the employer and employees participate. Billet's work on social constructivist approaches to workplace learning focuses mainly on learning that takes place within the contextual setting of the workplace. (Billet, 1996,) Cooper 2006. One characteristic of the workplace of the future is that the emphasis is moving from large to small, more nimble, resilient, fluid work teams (Cooper, 2006), which demands specific characteristics of individuals. The attempt will be to understand employees while they perform work in particular contexts that demand new competencies with FOW. Key knowledge can be generated by understanding the contexts of developing competencies.

Research problem
Within the Indian business context, FOW employee competencies will be the focus of study. FOW as a construct is defined as a business context which has characteristics of digital and virtual adaptability required while producing or serving for a customer.

1. What are the key characteristics that define the adaptation mechanisms as FOW organisations?
2. What are the various contexts of inter-firm and outside-firm collaborations that are taking place as an impact of FOW?
3. What are the changing requirements of the FOW employee competence while creating and delivering a product or service?

4. How does synchronising agreements evolve and flow between the employer and employee while the competence is developed amidst challenges of rapid changes?
5. What are the key elements and conditions of developing FOW employee competence organizationally, technically, socially and individually?

The objectives of the study

- To identify key characteristics that define the adaptation mechanisms of FOW
- To explore and understand various contexts of inter-firm and intra-firm collaborations in FOW context
- To understand the changing requirements of the FOW employee competencies across roles in collaborating teams
- To explore the exchanges and agreements carried out in organisation by both employer and employee in developing FOW competence
- To identify key supporting and constraining organisational, technological, social and individual factors in developing FOW competence
- To provide a generic framework for development and training on FOW employee competencies

Research methodology

A mixed methodology of both quantitative and qualitative will be used depending on the organisations who are willing to take part in the study. Qualitative study would be through Focus group discussions with sections of employees as well as one-on-one interviews across levels and roles in the organisations. Short surveys could be designed to explore specific phenomena.

Critical incidents and Learning from Incidents will be a framework adopted for data collection.
The sample can span across relevant industries with employees and managers. As a starting point, the Mckinsey (2018) framework on digital companies as Core disruptors, Efficiency enhances or Human machine collaborators will be used.

Implication of the study

The study will be useful in the Indian context to make some sense of the rapidly changing scenario and coping required in the digital and virtual work in Indian organisations.
A framework for development and training on FOW employee competence is a plausible outcome of the study.

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