

Critical soft skills for information and knowledge management practitioners in the fourth industrial revolution

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Background: Many technology jurisdictions have peddled the narrative that the key determinant for an innovative and sustainable fourth industrial revolution (4IR) environment is possessing hard technical skills. Hard technical skills are important to design the actual 4IR-based applications. Postmodernity demands that appropriate soft skills complement the hard skills to effectively integrate technology into various socio-economic value chains. In fact, soft skills are slowly becoming one of the critical enablers to harness the promise of the 4IR.

Objectives: This research article aimed to critically understand the soft skills considered to be essential in the South African context by different information and knowledge management (IKM) practitioners. The aims and objectives of the study were to fill the gap where other disciplines have specified soft skills whilst IKM does not. This study looked to identify soft skills to allow IKM practitioners an opportunity to identify and develop these skills.

Method: This research was designed based on the Delphi study principles and further used a systematic and targeted literature review to allow the researchers to make logical conclusions deductively. The authors followed a multimethod approach and analysed data using content analysis.

Results: The study results have demonstrated that soft skills are considered significantly more important than hard skills in South Africa. The study identified 57 total skills. However, only 17 had consensus from experts.

Conclusion: This study provides insights into the critical success skills needed to harness the socio-economics brought about by the 4IR. Further studies are required in different contextual settings to understand the global skills pertinent to the 4IR.

Keywords: soft skills; the fourth industrial revolution; information and knowledge management; information science; Delphi study.

Introduction

Skills and competencies are key dimensions to realising the promise of the fourth industrial revolution (4IR). Knowledge workers require both hard and soft skills because of the intricate, competitive and demanding nature of business practices (Ginting et al. 2020:3; Succi & Wieandt 2019:115). Organisations now regard soft skills as crucial for employment (Bak, Jordan & Midgley 2018:1064; Dogara et al. 2019:5872; Foerster-Metz & Golowko 2018:834). Soft skills are abilities that have to do with one's character, outlook and behaviour (Bak et al. 2018:1063; Lok, Cheng & Choong 2021:384). As the importance and demand for soft skills rise, it becomes crucial to research and cultivate them (Juhász & Horváth-Csikós 2021:453–454). However, despite the growing importance of soft skills, limited research is conducted on nurturing and managing soft skills (Bak et al. 2018:1064). Soft skills and competencies are essential for enabling individual participation in the 4IR.

Softs skills are increasing in both importance and role (Bak et al. 2018:1063). In today's world, it is not enough for workers to only possess hard skills; employees also need soft skills to develop in their work roles (Dogara et al. 2019:5872). Soft skills are a combination of mental and meta-cognitive skills, interpersonal, cerebral and applied skills (Succi & Wieandt 2019:116). Florea and Stray (2018:55) define soft skills as the attitudes, innate traits, behaviours and abilities that allow individuals to effectively manoeuvre their environments, work well with teams, perform

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optimally and attain their goals. To simply put, soft skills are personal characteristics, motivations, aims and preferences valued in business (Succi & Wieandt 2019:115).

Kaçamakovic (2021:296) referred to two studies that provided that soft skills were perceived to be 75% and 85%, respectively, responsible for business success. In contrast, hard skills only accounted for 25% and 15%, respectively. Additionally, a survey cited by Bak et al. (2018:1064) indicated that 72% of the Chief Executive Officers (CEOs) who participated considered soft skills to be the most essential skills for their organisations. As per the 2020 World Economic Forum's future of jobs report, most skills required now and in the future are soft skills (World Economic Forum 2020:35–36). These facts necessitate a study focusing on soft skills needed by Information and Knowledge Management (IKM) practitioners in South Africa.

The key gaps identified from a cursory literature review include finding ways for educational institutions to create opportunities for students to hone their soft skills (Juhász & Horváth-Csikós 2021:464). Additionally, investigating how collaborations between the academic, governmental and business sectors can assist with fulfilling skillset compliance and demand (Foerster-Metz & Golowko 2018:844). Adding to that, a study, or studies, on the soft skills required across multiple industries need to be conducted (Lok et al. 2021:398). Furthermore, from a literature review point, the limitations are that the skills listed in most studies are from countries outside South Africa, for example, the United Kingdom (Bak et al. 2018:1074). Thus, this study aims to determine the soft skills IKM practitioners require in the 4IR, particularly in South Africa.

Studying and practising the tools developed through IKM influences individuals' ability to review information and retrieve only helpful information (Shehata 2021:424). Information and Knowledge Management as a field focuses on establishing effective systems for facilitating information, knowledge and wisdom storage and distribution to allow for the resolutions of complex challenges (Guisseppe & Forgionne 1992:141). For example, an individual who can identify relevant and correct health-related information will have the ability to sustain his or her health through being able to realise when one needs health information, sourcing relevant information, being able to evaluate the quality of information and applying information effectively (Shehata 2021:417).

Acquiring information, knowledge and wisdom depends on conducting research through scientific justification, evaluation and examination. Information and Knowledge Management is the discipline that delivers the tools to perform this type of research (Guisseppe & Forgionne 1992:141). Information and Knowledge Management allows individuals to make well-thought-out calls on the information they come across (Wong, Walton & Bailey 2020:362–363). According to Guisseppe and Forgionne (1992:141), IKM involves examining the attributes and features of information,

knowledge and wisdom, for example, timeliness, accuracy (Thakur 2022), relevance (Boell & Cecez-Kecmanovic 2010:1) and accessibility (Arlkatti et al. 2019:215), amongst others. Information and Knowledge Management additionally provides the tools that allow the transfer of information, knowledge and wisdom to the mind, and the concepts, techniques and technologies that facilitate the usage of information, knowledge and wisdom, such as Microsoft SharePoint, which is a platform that enables knowledge sharing in an organisation.

Information and Knowledge Management is a leader in the knowledge economy, an economy built on the knowledge people and organisations have and use to generate revenue (Stamou 2017:321). Information and Knowledge Management focuses on the social, behavioural, psychological and information source elements of how people engage, process and utilise information (Wong et al. 2020:364). Additionally, theories of IKM allow for the development of an information culture (Shehata 2021:424). Information and Knowledge Management aims to improve the way people encounter information (Wong et al. 2020:364).

Furthermore, IKM is closely related to data (which plays a crucial role in enabling intelligent systems to function optimally) and includes topics such as data curation and management (Jackson 2021:1). Data in the 4IR plays a critical role in that it is used to train artificial intelligence (AI) (Herbert 2020). The key pillars of the 4IR rely on information to achieve intelligence, connectedness and automation.

Developing a capable workforce is crucial for success in the 4IR. It is essential to hold conversations on who to develop, what skills should be developed, who drives skills development, at what rate should development take place and how should development be supported (Anshari, Almunawar & Razzaq 2021:21). Technological innovations have affected the world of work both positively and negatively. For example, some people will lose their jobs to intelligent machines. Middle-class workers with medium-level skills face a high risk of losing their jobs (Molloy & Ronnie 2021:2).

In contrast, others, who hold the necessary skills, will gain jobs (Anshari et al. 2021:20–21), highlighting this study's importance. Providing the required soft skills IKM practitioners should develop will assist them in increasing their chances of employability and entrepreneurial success in the 4IR. This study identified the necessary soft skills IKM practitioners in South Africa should develop to succeed in the 4IR.

Literature review

The implications of the fourth industrial revolution on business

The 4IR has created a paradigm shift through cyber-physical systems (CPS). These systems function through multipurpose technologies applied across various industries

and include blockchain, the Internet of Things (IoT), AI and genomics, amongst others (Chalmers, MacKenzie & Carter 2021:1030). The 4IR has also introduced technologies that allow for the integration of physical technologies and concepts such as the IoT, big data, robotics, CPS, AI and additive manufacturing, amongst others (Anshari et al. 2021:21). These technologies alter competition rules, and they have transformed the nature and scope of business (Chalmers et al. 2021:1028). These technologies shift business paradigms (Bettiol et al. 2020:12) and assist with decreasing human error at work, which comes with added costs (Anshari et al. 2021:21). All these new technologies require humans to develop new skills.

The emergence of the 4IR was because of societal and economic (telecommuting, technology-dependent freelance and consulting services and humans getting used to more flexible work, which requires more collaboration) demands across the world as the levels of globalisation grew (Anshari et al. 2021:21). Working with others requires people to have soft skills such as emotional intelligence.

Change in the 4IR occurs faster than in previous eras because of the rapid diffusion of AI (Chalmers et al. 2021:1030). Developments in machine learning methods, which are made of a new generation of quantum and intelligent processors, drive the quick distribution of AI (Chalmers et al. 2021:1030). Organisations in various industries utilise 4IR technologies, including but not limited to manufacturing and production, education, retail, healthcare and agriculture (Anshari et al. 2021:21), also known as industry 4.0, education 4.0, health 4.0, and agriculture 4.0. (Anshari et al. 2021:22).

Health 4.0 technologies and agriculture 4.0 technologies are similar. The technologies allow health workers to monitor their patients in real time and from remote locations and enable farmers to track farming processes in real time (Anshari et al. 2021:22). Education 4.0 is commonly associated with smart learning. Smart learning spaces rely on Information Communication Technologies (ICTs) that focus on students who can adopt new learning styles and abilities (Anshari et al. 2021:24). In simple terms, smart learning refers to a learning space that facilitates learning on demand (Anshari et al. 2021:24). It is crucial that in the 4IR, learning should not be limited to technical skills but also include soft skills.

Whilst those who choose to embrace 4IR technologies will probably prosper, the opposite is true for those who do not (Molloy & Ronnie 2021:1). Organisations that utilise 4IR technologies can expect superior performance and opportunities to infiltrate new territories (Bettiol et al. 2020:12–13). For an organisation to fully take advantage of 4IR technologies, it should be willing to change its business models and value creation strategies. These technologies can entirely disrupt how, when and where business processes occur (Bettiol et al. 2020:14).

Technologies in the 4IR allow for automation to take place through the use of smart and intelligent systems (e.g. robots and self-driving cars (Moallem 2021) and machines being able to communicate with each other and cooperating independently of human intervention (Manesh et al. 2021:289). The intelligent machines of the 4IR can analyse and diagnose problems independently of human intervention (Anshari et al. 2021:22). Additionally, wealth generation is possible with fewer people involved in the work process, thereby decreasing labour costs (Chalmers et al. 2021:1030). For example, WhatsApp, a messaging application that only employed 55 people and had over 450 million users in 2014, sold for 19 billion dollars (Chalmers et al. 2021:1030). Soft skills represent advantages people have over machines that perform hard skills. This fact alone increases the importance of this study.

The economic wealth created by 4IR technologies will create many new jobs (Anshari et al. 2021:21). The new jobs created in the 4IR will require people to have skills related to Information Technology (IT), decision making, thinking, communication, creativity, complex problem solving and most critically, human skills – particularly if the job is human or customer centric (Anshari et al. 2021:23). One of the main competencies required in the 4IR is the capacity to work successfully in changing situations and environments (Kožuh, Maksimović & Zajić 2021:161). In South Africa, there exists a skills mismatch. The mismatch is because of tertiary institutions teaching skills that are not required in the workplace, which impedes industry and economic growth (Molloy & Ronnie 2021:3). Thus, it becomes essential for organisations to predict the skills needed in the future (Molloy & Ronnie 2021:3).

The rise of soft skills in business

Organisations consider soft skills critical components for business success (Kačamakovic 2021:295). According to Lok et al. (2021:318) and Foerster-Metz and Golowko (2018:834), soft skills are more important than hard skills. The distinction between hard and soft skills is that hard skills are traditionally linked to technical and administrative skills. On the other hand, soft skills are related to human, leadership, interpersonal and conceptual skills (Bak et al. 2018:1064). The advantage soft skills have on hard skills is that some hard skills become obsolete and cannot be transferred from one context to another (Bak et al. 2018:1064). However, soft skills are harder to monitor and measure as they are intrapersonal and interpersonal (Lok et al. 2021:384).

In the past, task-oriented fields like accounting and information systems overlooked soft skills; this has since changed (Bak et al. 2018:1064) – soft skills are required to supplement hard skills (Florea & Stray 2018:55). These are non-technical skills (Kačamakovic 2021:295), and different soft skills are needed for different environments. For example, one business unit might consider a specific ‘soft skill’ a hard skill (Ginting et al. 2020:3). For instance, bargaining skills are

considered a hard skill for salespeople but a soft skill for Human Resources (HR) workers, where it is referred to as a negotiation (Ginting et al. 2020:3). For this reason, Succi and Wieandt (2019:114) consider them wicked skills, mainly because they keep evolving. Notably, organisations should not sideline soft skills because they are harder to obtain and measure than hard skills (Ginting et al. 2020:2); they should embrace them regardless. Ten of the 16 skills identified by the World Economic Forum as essential for current and future jobs were soft skills (Succi & Wieandt 2019:114). In business, soft skills refer to the skills associated with acquiring human, people, behavioural or interpersonal skills in the work environment (Bak et al. 2018:1064).

Because of the importance of soft skills for business success, business leaders advocate for their development (Kačamakovic 2021:296). Soft skills are acquired through experience as they are not based on theory but rather application (Ginting et al. 2020:2). According to Dogara et al. (2019:5872), soft skills are personal attributes that a person retains and hones through active involvement in the teaching and learning process. Soft skills are transferable and adaptable to various situations (Succi & Wieandt 2019:116). However, there is 'no one size fits all' approach to soft skills as they may differ from organisation to organisation, depending on the organisation's vision, mission and values (Ginting et al. 2020:3).

Soft skills are about how malleable and cooperative a person can be, and their ability to problem solve and make decisions in specific environments (Juhász & Horváth-Csikós 2021:453). Soft skills are critical for social involvement, workplace success and personal growth (Ginting et al. 2020:3). Identifying the soft skills needed based on a job description is essential. For example, cultural awareness may not be required for an electrical engineer but is a definite requirement for a psychologist working in various communities (Ginting et al. 2020:3). Succi and Wieandt (2019:115) regard soft skills as life skills, transversal skills, generic and main competencies for a fruitful life, a society functioning optimally, and lifelong learning. The importance of soft skills justifies the undertaking of this research to determine the soft skills relevant for IKM practitioners in the 4IR.

Soft skills enable people to remain positive even when faced with adversity in the workplace and in their personal lives (Succi & Wieandt 2019:116). To ensure success, one must have the ability to adapt to changes, as working environments constantly change, requiring workers to use different time management methods and work with various people from diverse backgrounds and of varying age groups (Juhász & Horváth-Csikós 2021:453). Interpersonal skills are required for collaborative work as individuals need to understand how to deal with different personalities whilst working in teams, building relationships and sharing knowledge (Juhász & Horváth-Csikós 2021:454).

The Financial Times conducted a study that concluded that having the ability to collaborate and work with people from distinct backgrounds were the highest-rated skills required (Ginting et al. 2020:1). Employers consider teamwork and trust essential for business success and state that both depend on good communication (Kačamakovic 2021:296). Lok et al. (2021:384) argue that the most essential soft skills are communication, interpersonal skills, teamwork, adaptability and problem-solving. Additionally, good organisation and time management skills enable people to effectively handle daily tasks (Juhász & Horváth-Csikós 2021:454).

Figure 1 indicates what was found during the literature review to provide additional soft skills and add onto what the data from respondents provided, as a workforce holding the necessary soft skills are required to satisfy the new mandate from employers to fuel 4IR technologies and maintain a competitive edge (Lok et al. 2021:384).

Research problem, aim, objectives and question

Soft skills are considered more important than hard skills (Foerster-Metz & Golowko 2018:834; Kačamakovic 2021:296; Lok et al. 2021:318; Succi & Wieandt 2019:116) and even the most critical skills by various authors (Lok et al. 2021:384; Bak et al. 2018:1064), yet not much research is done on them (Bak et al. 2018:1064). This highlights the importance of this study as it aims to identify the soft skills required by IKM practitioners in the 4IR. Change in the 4IR occurs faster than in previous eras. Individuals must have soft skills, which will enable them to deal with and adapt to the continually changing work environments (Juhász & Horváth-Csikós 2021:453). A Delphi study was conducted to generate as many soft skills as possible from experts in the IKM field to fulfil the study's aim and determine which of the identified skills were accepted by all participants. The study's research question was 'what soft skills are required by IKM practitioners in the 4IR?' The study objectives were 'to determine relevant soft skills for IKM practitioners in the 4IR and determine which of the identified soft skills were regarded relevant by all practitioners'. This research aimed to critically understand the soft skills considered essential in the South African context by different IKM practitioners. The study aims to fill the gap where other disciplines have specified soft skills whilst IKM does not. This study aimed to identify soft skills to allow IKM practitioners an opportunity to identify and develop these skills.

Methodology

Because of the focus of this study being to uncover the truth on which soft skills are relevant for IKM practitioners, pragmatism had to be utilised (Baker & Schaltegger 2015:265). It was necessary to employ a multimethod research

Adaptability (Juhasz & Horváth-Csikós 2021:454)	Analytical skills (Dogara et al. 2019:5872; Foerster-Metz & Golowko 2018:834-837)	Assertiveness (Juhasz & Horváth-Csikós 2021:454)	Attentiveness (Foerster-Metz & Golowko 2018:834-837)	Behavioural skills (Bak et al. 2018:1065)	Capacity for life long learning (Succi & Wieandt 2019:115)	Collaboration skills (Dogara et al. 2019:5872; Bak et al. 2018:1065)	Commitment (Chalupa & Chadt 2021:517-518)	Communication skills (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295; Lok et al. 2021:384; Chalupa & Chadt 2021:517-518; Ginting et al. 2020:1; Dogara et al. 2019:5872; Succi & Wieandt 2019:115; Bak et al. 2018:1065; Foerster-Metz & Golowko 2018:834-837)	Conceptualising skills (Dogara et al. 2019:5872; Bak et al. 2018:1065)	Confidence (Chalupa & Chadt 2021:517-518; Succi & Wieandt 2019:115)	Conflict resolution (Chalupa & Chadt 2021:517-518)	Creativity (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295; Lok et al. 2021:384; Succi & Wieandt 2019:115)
Critical thinking (Kačamakovic 2021:295; Lok et al. 2021:384; Succi & Wieandt 2019:115; Dogara et al. 2019:5872)	Cultural awareness (Chalupa & Chadt 2021:517-518; Foerster-Metz & Golowko 2018:834-837)	Curtesy (Kačamakovic 2021:295)	Decision making skills (Bak et al. 2018:1065)	Digital literacy (Kačamakovic 2021:295)	Emotional intelligence (Lok et al. 2021:384; Chalupa & Chadt 2021:517-518)	Empathy (Chalupa & Chadt 2021:517-518; Foerster-Metz & Golowko 2018:834-837)	Entrepreneurship (Lok et al. 2021:384)	Ethical (Ginting et al. 2020:1; Succi & Wieandt 2019:115)	Flexibility (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295; Chalupa & Chadt 2021:517-518; Bak et al. 2018:1065; Foerster-Metz & Golowko 2018:834-837)	Foreign language proficiency (Kačamakovic 2021:295)	Good attitude (Kačamakovic 2021:295; Florea & Stray 2018:55)	Good customer service (Kačamakovic 2021:295; Foerster-Metz & Golowko 2018:834-837)
Good judgement (Lok et al. 2021:384)	Handling uncertainty well (Succi & Wieandt 2019:115)	Human management skills (Bak et al. 2018:1065)	Independence (Foerster-Metz & Golowko 2018:834-837)	Organisational skills (Juhasz & Horváth-Csikós 2021:454; Foerster-Metz & Golowko 2018:834-837)	Prioritisation (Foerster-Metz & Golowko 2018:834-837)	Proactivity (Foerster-Metz & Golowko 2018:834-837)	Problem solving (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295; Lok et al. 2021:384; Dogara et al. 2019:5872; Succi & Wieandt 2019:115; Foerster-Metz & Golowko 2018:834-837)	Professionalism (Kačamakovic 2021:295; Lok et al. 2021:384)	Quick information sharing (Kačamakovic 2021:295)	Reliability (Juhasz & Horváth-Csikós 2021:454)	Resilience (Chalupa & Chadt 2021:517-518; Foerster-Metz & Golowko 2018:834-837)	Resource management (Dogara et al. 2019:5872)
Responsibility (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295)	Self-initiative (Kačamakovic 2021:295)	Social skills (Kačamakovic 2021:295; Dogara et al. 2019:5872; Succi & Wieandt 2019:115)	Teamwork (Juhasz & Horváth-Csikós 2021:454; Kačamakovic 2021:295)	Thinking out of the box (Juhasz & Horváth-Csikós 2021:454)	Time management (Juhasz & Horváth-Csikós 2021:454)	Transversal skills (Succi & Wieandt 2019:115)	Trust (Kačamakovic 2021:295)	Versatility (Kačamakovic 2021:295)	Work ethic (Kačamakovic 2021:295)			

FIGURE 1: A summary of the soft skills identified through reviewing the literature.

paradigm as qualitative and quantitative data were needed to uncover this truth. A Delphi study aims to get experts to reach a consensus on a specific subject (Puig & Adams 2018:480). Another aim of a Delphi study is to acquire information that can help solve real-world issues, plan, and decision-making (Salkind 2011:241). The researchers applied deductive reasoning to draw logical conclusions based on the collected data.

Researchers utilise questionnaires to ask respondents a set of questions to address research objectives (Hesse 2018:1718). For this study, the researchers used questionnaires firstly to collect data identifying the soft skills needed by IKM practitioners (Delphi round 1) and secondly to determine which skills were most relevant through respondents reaching a consensus (Delphi round 2 – only seven respondents participated in this round). Additionally, the researchers used questionnaires because they are self-administered (Hesse 2018:1718). The research strategy used for this study is expert reviews (expert-centred research (Usability.de 2021), as the researchers consulted experts on the essential soft skills required by IKM practitioners in the 4IR.

The sampling method selected was purposive sampling as there was a need for the researchers to identify experts in IKM. These experts were selected based on their deep

knowledge of IKM. They were either in management positions in their organisations and garnered vast working experience in the IKM field or IKM professors in academia. The initial sample size was eight. However, because of the rigorous nature of Delphi studies, one of the respondents withdrew, thereby leaving seven respondents. The researchers used content analysis to examine the experts’ interpretations of the phenomena and summarise these interpretations (Hsieh & Shannon 2018:393). The data from Google Forms was downloaded into Microsoft Excel and analysed using content analysis to identify the soft skills detailed by respondents.

Again, the researchers used Microsoft Excel to tabulate and create summaries from the data collected. Additionally, Google Forms graphs were used to capture the interpretations on which of the identified skills were indeed required by IKM practitioners using a five-point scale, with one being completely disagree and five being completely agree. In the following results section, discussions only focus on soft skills where the respondents reached a consensus. To achieve a consensus on the importance or usefulness of a particular skill, all respondents had to select options ‘four’ or ‘five’ (agree or completely agree). The explanation of the methodology used is extensively detailed to ensure that a similar study can be conducted, thereby providing confirmability (Baskerville 2014:692), which gives

the study validity and reliability. Additionally, to ensure credibility, the researchers, because of the utilisation of a Delphi study, continuously liaised with respondents to certify that their interpretations of the phenomena at hand were accurately portrayed in the findings (Mills, Durepos & Wiebe 2012:243).

This article is part of a bigger study, which was given ethical clearance by the University of Johannesburg's College of Business and Economics (CBE) Research Ethics Committee. The ethical clearance code is 2020SCiS51. Additionally, the researchers provided all respondents with letters of informed consent before participation to inform them of their rights, roles and responsibilities in terms of their involvement in the study. With purposive sampling, researchers cannot generalise their findings (Bryman & Bell 2011). However, because of their usage of this type of sample, they can identify the best people available to answer pertinent research questions, as was the case for this study. One of the limitations of using a Delphi study is determining the number of experts to include in your panel, who also have a potential for bias (Salkind 2011:241). However, it is important not to include too many respondents with Delphi studies as this may lead to difficulties in reaching a consensus on matters. Attrition is another factor that comes into play as Delphi studies can be time consuming (Salkind 2011:241) – in this study, data were collected over 3 months as data had to be analysed after each round of the Delphi study. The researchers then liaised with respondents to ensure that accurate data was captured and disseminated.

The researchers allowed respondents 2 weeks to a month (for each round) to respond to the questionnaire to mitigate attrition. The time permitted helped with attrition and allowed respondents to detail most of their ideas and keep

adding to what they initially had in mind over time. Because of the broad nature of IKM, experts in the field typically have favourite topics, thereby increasing the possibility of respondent bias. Conducting a Delphi study mitigates this in that all the respondents get to view the results from other respondents and give their thoughts on those results, thus limiting bias based on personal preference. Because of the data being collected at a specific point in time (Cummings 2018:315), the time horizon of the study was cross-sectional.

Ethical considerations

This article is part of a bigger study, which was given ethical clearance by the University of Johannesburg's CBE Research Ethics Committee. The ethical clearance code is 2020SCiS51. Additionally, the researchers provided all respondents with letters of informed consent before participation to inform them of their rights, roles and responsibilities in terms of their involvement in the study.

Results

The respondents listed 57 skills; however, given that this was a Delphi study, the authors' discussions focused on those skills where a consensus was reached. It is key to note that skills were grouped based on having shared traits after analysis. The scale that was used was as follows: 5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree and 1 = strongly disagree. The numbers seen as headings in Figures 2–6 represent the options selected by respondents. There was a consensus on 17 soft skills identified, meaning that a consensus was not reached on 40 of the skills identified.

Aptitude skills where a consensus was not reached

5,4,3	5,4,3,2	5,3,2	4,3,2	4 and 2
Logic = Four (57.1%) participants strongly agree, two (28.6%) agree and one (14.3%) was neutral.	Networking skills = Four (57.1%) participants agreed, one (14.3%) strongly agreed, one was neutral, and one disagreed.	Sense of survival = Five (71.4%) participants were neutral, one (14.3%) strongly agreed, and one disagreed.	Sense of identity and confidence = Four (57.1%) participants agreed, two (28.6%) were neutral, and one (14.3%) disagreed.	Tenacity = Six (85.7%) participants agreed, and one (14.3%) disagreed.
Patience = Three (42.9%) participants were neutral, two (28.6%) strongly agreed and two agreed.	Keyboarding (fast) = Two (28.6%) participants agreed, two disagreed, two were neutral, and one (14.3%) strongly agreed.			
Discipline = Three (42.9%) participants strongly agreed; another three agreed, and one (14.3%) was neutral.	Self-management/initiative/self-direction = Four (57.1%) participants strongly agreed, one (14.3%) agreed, one was neutral, and one disagreed.			
Social intelligence = Five (71.4%) participants agreed; one (14.3%) strongly agreed and one was neutral.				
Advanced interpersonal communication skills = Four (57.1%) participants agreed, two (28.6%) strongly agreed and one (14.3%) was neutral.				

FIGURE 2: Results of aptitude skills with no consensus.

5,4,3	5,4,3,2	5,3,2	4,3,2	4 and 2
Cross-cultural competency = Five (71.4%) participants agreed; one (14.3%) participant strongly agreed and one was neutral.				
Cognitive flexibility = Four (57.1%) participants strongly agreed, two (28.6%) agreed and one (14.3%) was neutral.				
Judgement = Three (42.9%) participants agreed, two (28.6%) strongly agreed and two were neutral.				
Design thinking = Four (57.1%) participants strongly agreed, two (28.6%) agreed and one (14.3%) was neutral.				
Insight = Three (42.9%) participants strongly agreed, another three agreed, and one (14.3%) was neutral.				
Novel and adaptive thinking (combination) = Four (57.1%) participants strongly agreed, two (28.6%) were neutral and one (14.3%) agreed.				
Accountability = Three (42.9%) participants strongly agreed, another three agreed, and one (14.3%) was neutral.				
Proficiency in English and at least two other languages = Four (57.1%) participants were neutral, two (28.6%) agreed, and one (14.3%) strongly agreed.				
Work diversity and exposure to a variety of industry processes = Four (57.1%) participants agreed, two (28.6%) were neutral and one (14.3%) strongly agreed.				
Having a digital mindset = Three (42.9%) participants strongly agreed, another three agreed, and one (14.3%) was neutral.				

FIGURE 2 (Continue...): Results of aptitude skills with no consensus.

Research-oriented skills where a consensus was not reached

5,4,3	5,4,3,2	4,3,2
Solid understanding of the different research methods for big data science = Five (71.4%) participants agreed that it would be useful; one (14.3%) participant strongly agreed, and another was neutral.	Established research skills = Four (57.1%) participants agreed, one (14.3%) strongly agreed, one was neutral, and one disagreed.	Marketing = Three (42.9%) participants agreed, three were neutral, and one (14.3%) disagreed.
Competitive Intelligence skills = Five (71.4%) participants agreed; one (14.3%) strongly agreed, and another one was neutral.		
Business Intelligence = Four (57.1%) participants agreed, two (28.6%) strongly agreed, and one (14.3%) was neutral.		

FIGURE 3: Results of research-oriented skills with no consensus.

Data, information and knowledge skills where a consensus was not reached

5,4,3	5,4,2	4 & 3
Good understanding of the common data behaviours of managers, programmers, scientists, and other users = Three (42.9%) participants strongly agreed, another three agreed, and one (14.3%) was neutral.	Business process “one source of truth” — the skill to eliminate data waste = Five (71.4%) participants agreed; one (14.3%) participant strongly agreed, and one disagreed.	Understanding of the role institutions, agencies, policies, and laws play in data curation = Six (85.7%) participants agreed, and one (14.3%) was neutral.
Knowledge translation = Four (57.1%) participants strongly agreed, two (28.6%) agreed, and one (14.3%) was neutral.		
Social insight story-tellers/visualisators (big data translators) = Three (42.9%) participants strongly agreed, another three agreed, and one (14.3%) participant was neutral.		

FIGURE 4: Results of data, information and knowledge-related skills with no consensus.

Organisation operation skills where a consensus was not reached

5,4,3	4,3,2,1
Service orientation = Three (42.9%) participants strongly agreed, two (28.6%) agreed, and two (28.6%) were neutral.	No completely new skills would be required = Three (42.9%) participants were neutral, one (14.3%) agreed, one disagreed, and two (28.6%) completely disagreed.
Organisational skills = Four (57.1%) participants agreed, two (28.6%) strongly agreed, and one (14.3%) was neutral.	

FIGURE 5: Results of organisation operation skills with no consensus.

Digital skills where a consensus was not reached

5,4,3	4 & 3
Business digital competitiveness = Five (71.4%) participants agreed; one (14.3%) strongly agreed, and one was neutral.	Co-locators (technology translators) = Five (71.4%) participants agreed, and two (28.6%) were neutral.
New media literacy (4IR media fluency) = Four (57.1%) participants agreed, two (28.6%) were neutral, and one (14.3%) strongly agreed.	
Digital product management skills = Three (42.9%) participants agreed, two (28.6%) strongly agreed, and two were neutral.	
Disruptive technology trend analysis tools = Three (42.9%) participants agreed, two (28.6%) strongly agreed, and two were neutral.	
Search engine optimisation = Four (57.1%) participants agreed, two (28.6%) were neutral, and one (14.3%) strongly agreed.	

FIGURE 6: Results of digital skills with no consensus.

Discussion on skills where respondents reached a consensus

Leadership

Six (85.7%) respondents agreed to leadership being useful as a soft skill, and one (14.3%) strongly agreed. The reason

could be that the consequences of not having good leadership can be devastating. For example, coronavirus disease 2019 (COVID-19) outbreaks were worse than they should have been because of the lack of good leadership as leaders advocated for less stringent non-pharmacological interventions, that is, hand washing, wearing masks and social distancing, amongst others. Additionally, good leadership is crucial for the growth and evolution of humanity (Nagan & Manausa 2020:205).

Adaptability

Five (71.4%) respondents agreed that adaptability would be useful, and two (28.6%) strongly agreed. The researchers attribute these results to the fact that being adaptable refers to one's capacity to make adjustments in terms of their behaviour, thinking and emotions to deal with changing environments and the uncertainty of events (Zong et al. 2021:75). For example, the business environment and occurrences in the 4IR era.

Flexibility

Six (85.7%) respondents agreed to flexibility being useful as a soft skill, and one (14.3%) strongly agreed. The respondents could have had this view because flexibility as a personality trait allows people to keep an open mind and be flexible in their decision-making (Steenhaut et al. 2020:446). Additionally, being flexible enables people to move between tasks swiftly and to have the desire to shift between different mental processes at a given time.

Emotional intelligence

Four (57.1%) respondents agreed that emotional intelligence would be useful as a soft skill, whilst three (42.9%) strongly agreed. Emotional intelligence refers to the capacity to perceive emotions accurately and assess and express emotions amply (Sternberg & Kaufman 2017).

Honesty

Four (57.1%) respondents agreed with honesty being a useful soft skill to have, and three (42.9%) strongly agreed. The sentiment here could be that honesty can increase trust.

When a person is honest, they speak the truth, candidly present themselves and take responsibility for their actions (VIA Institute on character 2021).

Integrity

Four (57.1%) respondents agreed that integrity is useful as a soft skill, and three (42.9%) strongly agreed. The respondents may have voted in this manner because when an individual is said to have integrity, they are perceived to uphold their values, beliefs, ethical standards and always do what is right irrespective of the circumstances (Chadwick 2021).

Collaboration skills

Five (71.4%) respondents agreed that collaboration skills are useful, and two (28.6%) strongly agreed. Collaboration refers to the capacity to work in a team with people from different backgrounds (Henukh & Astra 2021:3). Additionally, having collaboration skills means a person is flexible, willing to compromise to achieve goals, and understands the value of the individual contributions made in a team, thereby willingly assuming shared responsibility (Henukh & Astra 2021:3).

Active learning

Five (71.4%) respondents agreed that active learning is useful, whilst two (28.6%) strongly agreed. The respondents' perceptions regarding active learning may be influenced by the fact that with active learning, people are encouraged to think critically and actively seek information through research (Cambridge Assessment International Education n.d.; Castro et al. 2008:241).

Willingness to learn

Four (57.1%) respondents agreed that having a willingness to learn is useful, whilst three (42.9%) strongly agreed. With the respondents being people who typically require people to learn new skills, it comes as no surprise they voted in this manner. A willingness to learn means an individual wish to grow and obtain new knowledge (Noplag 2017:Internet source). People who have a willingness to learn desire to be more qualified and stay up-to-date with the latest trends.

Critical thinking

Six (85.7%) respondents strongly agreed to critical thinking being a useful soft skill, and one (14.3%) agreed. It is easy to understand why the respondents held this position because critical thinking is one of the required 4IR skills as per the World Economic Forum (2016:79). A critical thinker is a person who can think effectively about challenging issues, analyse evidence, act rationally and ascertain credibility, which is crucial for success in future jobs.

Ethical awareness for the use of data and big data

Five (71.4%) respondents agreed that ethical awareness for the use of data and big data is useful as a soft skill, and two

(28.6%) strongly agreed. With the respondents having to adhere to ethical guidelines daily, it was safe to assume that they would reach a consensus on this skill. Being ethically aware when working with data and big data is essential as it means a person will always be conscious of the necessary ethics to uphold when faced with decisions that present ethical dilemmas (Latan, Jabbar & Jabbar 2019:292).

Innovation

Four (57.1%) respondents agreed that being innovative would be useful, whilst three (42.9%) strongly agreed. The reasoning behind this could be that being innovative leads to excellence as innovative people obtain a sense of self-worth through excelling and taking on something new. Additionally, innovation helps businesses develop and stay ahead of competitors and allows businesses to take advantage of new technological inventions (MasterClass 2021).

Planning skills

Six (85.7%) respondents agreed to planning skills being useful soft skills, and one (14.3%) strongly agreed. Having the ability to develop and execute plans is essential for the organisational success. Planning skills are crucial because they are the tools that enable the development and execution of plans. For example, planning involves knowing what to do to achieve a goal, forecasting and handling challenges, and using employees (effectively communicating the plan is critical (Doyle 2021) and opportunities to achieve goals.

Data collection and analysis

Five (71.4%) respondents agreed that having data collection and analysis skills would be useful, and two (28.6%) strongly agreed. It can be argued that a consensus was reached because data collection allows for information and first-hand knowledge to be acquired for business, governmental or academic purposes. On the other hand, data analysis is concerned with revealing meaning from the collected data (Deja et al. 2021:708).

The ability to find, access, evaluate and transform data to information

Four (57.1%) respondents strongly agreed that the ability to find, access, evaluate and transform data to information is useful, whilst three (42.9%) agreed. It is critical to note that this skill is one of the few where most respondents strongly agreed, highlighting its perceived importance. The ability to find, access, evaluate and transform data to information can be referred to as data literacy skills, which are defined by Deja et al. (2021:708) as skills that enable the gathering, processing, examination and effective communication of information abstracted from the data, to support decision making.

The ability to use new information tools (continuous improvement)

Five (71.4%) respondents agreed that the ability to use new information tools (continuous improvement) is useful, and two (28.6%) strongly agreed. The justification for this could be that because information is crucial for business success, information needs to be accessible at the right time (when a decision needs to be made) and can avert crisis (Vukajlović et al. 2019:38).

Being familiar with industry trends in big data systems

All (100%) respondents agreed that being familiar with industry trends in big data systems was useful. It is safe to assume that the results were because of having familiarity with industry trends in big data systems that can allow people to take advantage of big data. Big data provides valuable information that can be used for business intelligence, predictions and decision support (Rayala & Kalli 2020:701).

Upon further analysis, it became apparent that the respondents confirmed most (32) of the soft skills provided in the literature as essential for other industries and critical for IKM practitioners. These soft skills included adaptability, analytical skills, lifelong learning, collaboration, communication and conceptualisation. Additional skills are creativity, critical thinking, cultural awareness, decision-making, digital literacy, emotional intelligence and entrepreneurship.

Being ethical, language proficiency, good attitude, service orientation, cognitive flexibility, leadership, independence, planning, resilience, accountability, social intelligence, honesty and good work ethic were also identified. This means when data was collected, more soft skills were provided by participants. However, upon analysis, some skills were basically the same thing provided using different terms. For example, adaptability subsumed flexibility, organisational skills, resource management and prioritisation were subsumed by planning. It also came out that most soft skills identified and received a consensus had to do with aptitude.

Conclusion and recommendations

The key finding was that soft skills have surpassed hard skills in importance for organisational success. Depending on the organisation, some soft skills may be regarded as hard skills and vice versa. Therefore, organisations need to determine what they consider soft or hard skills. Information and Knowledge Management practitioners can acquire many soft skills; 57 were identified in this study and were grouped in the following categories: aptitude skills; research-oriented skills; data, information and knowledge focused skills; organisation operation skills and digital skills. However, all respondents supported only 17. These are leadership; adaptability; flexibility; emotional intelligence; honesty; integrity; collaboration skills; active learning; a

willingness to learn; critical thinking; ethical awareness for the use of data and big data; innovation; planning skills; data collection and analysis; the ability to find, access, evaluate and transform data to information; the ability to use new information tools (continuous improvement) and being familiar with industry trends in big data systems. This study was a Delphi study and is part of a pilot for a bigger project. Thus all the research design tools were adapted to suit a Delphi study. The study's aim was fulfilled as IKM practitioners will now have a base to identify the soft skills pertinent in their field. Recommendations for future research are to conduct studies that will help determine whether IKM practitioners in the world of work hold the soft skills identified in this study and whether organisations have put measures to allow their talent to hone these soft skills.

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