Research article

Digital Transformation and Employees: Four Years After COVID-19

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Abstract: Digital transformation (DT) has become a highly studied phenomenon. Organizations seek to be digitally transformed because of the value that DT can bring. However, it is believed that such value will not be captured unless the decision is studied. That said, crises have happened when organizations have found themselves with no choice but to make quick and unstudied decisions. The literature shows that the COVID-19 pandemic has been a trigger whereby organizations have been forced to digitally transform using a variety of technological applications to maintain their work and productivity. The aim of this research was to explore the role of the COVID-19 pandemic in DT during the crisis and four years later, and how employees have impacted or been impacted by such transformation. This research found that the COVID-19 pandemic has had a positive impact on those organizations where it has sped up the process of transformation and reduced managers' fears. Although neither employees nor infrastructure were ready for this sudden transformation, the data have shown that organizations were able to reflect during the four years and improve their situations. It is believed that the crisis changed the context of DT in that it was able to succeed with no or very little preparation. A key reason for such success is the fact that employees understood the significance of their roles and felt important and responsible during and after COVID-19. Therefore, this stresses the importance of users, who are employees, becoming engaged so they better understand the motives for DT and take more responsibility in relation to it, which positively impacts transformation.

**Keywords:** Digital transformation, Information systems, Employees, COVID-19

Introduction

In this era, technology has become dominant, and this is accelerating change. During the past decade, governments and corporate communities throughout the world have been paying close attention to digital transformation (DT) (Ghobakhloo, 2020; Nascimento et al., 2019; Nadeem et al., 2024). According to Furr et al. (2022), DT has changed the way value is created as well as how it is captured.
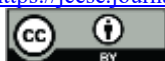
In the same vein, Vial (2021) showed that DT offers value propositions, value networks, and agility to organizations. DT is "an evolutionary process that leverages digital capabilities and technologies to enable business models, operational processes and customer experiences to create value" (Morakanyane et al., 2017, p.437). Most organizations have found that they have needed to digitally transform as a result of COVID-19 (Kokshagina and Schneider, 2023), and this has not given sufficient time for organizations to study and reflect on such decisions. Since this research investigates an information systems (IS) perspective, it is assumed that employees are the users of DT. When it comes to technology and users, the literature has shown that there are those who struggle to use technology and need technical support (Bosch-Rekveldt et al., 2011; Karanasios and Parker, 2017; Princes et al., 2024). This could mean that during COVID-19 employees did not have time to prepare or obtain sufficient support, which might have negatively impacted the transformation in their organizations. It is important that organizations that took decisions relating to DT during the COVID-19 pandemic reflect on those decisions as they might not have been the right ones after all, especially when it comes to employees. Thus, the research objective is to understand the role of COVID-19 in DT and the role employees had during the crisis and have now, after four years. The researcher was motivated to study this important aspect of the topic because it was possible that organizations would not have reflected on these decisions. This can lead to DT failure, which means loss of money, effort, and so on, and this phenomenon needs to be explored.

The research objective was achieved by answering the following research question:

RQ1: How has the COVID-19 pandemic influenced digital transformation, and what role have employees had?

The next section is the literature review, followed by the methodology section, the findings and discussion section, and, finally, the conclusion.

Literature review

The research shows that there is an unambiguous relationship between DT solutions and organizations' success, including in terms of resilience and better strategic moves, as well as resource allocation and cost cutting (Soto-Acosta, 2024). DT also allows organizations to innovate new business models (Spieth et al., 2022; Klein et al., 2024). The studies presented thus far provide evidence that organizations take the decision to digitally transform because of the impact DT might have and the ways in which they can maximize the benefit. In view of this, one may suppose that DT is no longer a luxury: it is key in an era when the economic environment is not stable, taking into account recovery from COVID-19, the Russia-Ukraine war, and so on (Soto-Acosta, 2024).

As regards COVID-19, it has also had a major impact on DT when it comes to acceleration, as most organizations have adopted remote working as well as digitizing procedures (Furr et al., 2022; Kokshagina and Schneider, 2023; Princes et al., 2024). Therefore, it can be argued that organizations

take decisions on DT based on the advantages that might be obtained from it, as well as COVID-19 being a trigger. In fact, this paper raises the concern that most organizations that adopted DT during COVID-19 have not been able to do it systemically. Kokshagina and Schneider (2023) made the important point that during COVID-19 and lockdown organizations were forced to digitally transform without enough preparation. Research has shown that DT caused tensions for employees: while they felt that DT provided them with flexibility and autonomy, in fact their habits changed to staying connected 24 hours a day, seven days a week (Kokshagina and Schneider, 2023). Although the role of COVID-19 has been highlighted as a trigger of the transformation, the research does not show what implications it has had since then.

In fact, it should be noted that there is a high level of failure when it comes to DT initiatives (Wade and Shan, 2020; Klein et al., 2024). The adoption of DT means the use of new tools, which necessitates changes in the work environment including processes, business models, and behaviours (Princes et al., 2024). Adopting new technology and implementing a number of adjustments to operational procedures, market strategies, organizational structures, managerial competencies, and skill sets are all part of the process of digitalization (Fernandez-Vidal et al., 2022; Balakrishnan and Das, 2020; Bresciani et al., 2021; Nadeem et al., 2024). Therefore, DT is not an objective: it is a strategy where organizational process changes are frequently necessary (Furr et al., 2022). Considering all this evidence, it seems that DT has its challenges and neglecting such challenges could lead to DT failure. Additionally, this means that the COVID-19 pandemic did not allow organizations to strategically prepare for such a transformation.

A key challenge that is raised in the literature is the fact that those who struggle with the adoption of technology need technical support (Bosch-Rekveldt et al., 2011; Karanasios and Parker, 2017; Princes et al., 2024). It becomes clear that DT could raise challenges such as those relating to digital equity and digital literacy, which may act as a barrier to societal and economic benefits (Soto-Acosta, 2024). In fact, there is a complex relationship between people and the use of digital technologies (Sull and Eisenhardt, 2015; Furr et al., 2022), and thus this transformation needs to be built around people. This might have been even more challenging when organizations were forced to transform but had not prepared their employees.

This is where the IS perspective becomes important. In fact, Vial (2021) showed that DT has become a significant phenomenon for study in IS research. Drawing from earlier IS research, it is apparent that individuals' expectations are key when it comes to the adoption of technology: if the reality matches their expectations, they are able to maintain a positive attitude (Princes et al., 2024). Most IS research investigates technology rather than users (Issa, 2022). This might indicate that organizations tend to focus on technology rather than people where researchers need to investigate such a phenomenon. Scholars are increasingly emphasizing that the effectiveness of DT initiatives

depends on employees and their support (Poláková-Kersten et al., 2023; Schneider and Sting, 2020; Wade and Shan, 2020; Klein et al., 2024). In IS research, it is believed that the success of systems depends on their users. Thus, since research to date has not yet explored DT and the role that employees play, especially when it comes to COVID-19 as a trigger for DT, this paper aims to explore the role of employees during DT and how this has shaped DT during the four years of COVID-19.

While there are several IS theories, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), it should be noted that the adoption of DT diverges from the adoption of other technologies (Klein et al., 2024), which might indicate that DT is unique and that this necessitates the investigation of the perceptions of employees, as the users of DT, especially when they have been mostly forced to undertake digital transformation because of COVID-19. Thus, this paper argues that very little is currently known about how ready employees were, how they were approached, and how they have been supported since COVID-19 as their organizations have been digitally transformed. One of the most important theories for comprehending behaviour at work is social exchange theory (SET) (Cropanzano and Mitchell, 2005). Given DT's uniqueness, this theory might be appropriate for, and provide a useful lens on, the context of this research.

A fundamental principle of SET is that relationships develop into mutually committed, trusting and loyal partnerships over time, guided by particular "rules" of exchange (Cropanzano and Mitchell, 2005). Relational behaviours are significantly influenced by trust, which has a similar function in the context of IS projects (Park et al., 2015). For example, individuals will typically respond in kind to positive initiating activities by making more positive or less negative reciprocating responses (Cropanzano et al., 2017). In the context of this research, employees and organizations need to establish trust to ensure a positive outcome of DT. Therefore, this research is inspired by SET theory and its principles and how it might relate to relationships between organizations and their employees during DT, and to the impact of the COVID-19 pandemic.

Overall, this paper conceptualizes DT as a system development where employees are the users of the system. Its aim is to contribute to the DT discussion and the IS literature by increasing understanding of how COVID-19 has shaped DT and the role of employees, the training/support that they have received, and how this has changed after four years of development, as well as discovering what can be raised during data collection that might contribute to the field.

Methodology

This study explores DT in the context of crisis, with a specific focus on employees as the users of this transformation. This means there is a need to understand their thoughts on the phenomenon under study. Therefore, this research adopted a qualitative approach. This approach is well known when it comes to understanding behaviours, topics, or the 'why' question (Rosenthal, 2016). There are many

qualitative methods that can be used, such as interviews, observations, document analysis, and so on. However, this study utilized interviews. According to Fontana and Frey (2003), interviews are powerful when it comes to understanding thoughts. It should be noted that there is no specific guidance on sample size when it comes to qualitative research as the focus is on quality not quantity (Marshall et al., 2013). That said, Saunders et al. (2016) indicated that the minimum sample for conducting interviews is between 5 and 25 participants.

In this research, 16 in-depth interviews were conducted in four different public sector areas in Saudi Arabia: education, higher education (university), health, and governorate. This approach allowed the researcher to gain a holistic understanding of the common feeling about and practice of DT, which can be followed by other studies that investigate each sector in more depth. While some might argue that the sample size is insufficient, qualitative research, as discussed, is more about quality and the insight that is gained until the researcher feels they have sufficient insight to conduct the analysis. All interviews took place in the entity workplaces and were conducted face to face. Access was gained through various gatekeepers in the highlighted sectors. Participants were selected randomly but it was ensured that they were drawn from different age groups and had differing numbers of years of experience and technology backgrounds. In terms of the data analysis, this research adopted a thematic analysis. Thematic analysis is "a method for identifying, analysing, and interpreting patterns of meaning (themes) within qualitative data" (Clarke and Braun, 2017, p.297). Six phases of data analysis were conducted, as a suggested by Braun and Clarke (2006). These phases can be seen in table 1.

Table 1: Six phases of thematic analysis: Braun and Clarke, 2006, p.87).

Phase	Description of the process
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

In terms of quality issues and bias, the researcher was able to become aware of his beliefs and participation in the study process by using self-critical reflection, or "reflexivity", when necessary (Spencer et al., 2014). This practice is believed to be important in qualitative research. Furthermore, the researcher's explanation of methodological choices demonstrates transparency, which can bolster

the reader's faith in the validity of the research findings. Finally, the research gained ethical approval from the ethics committee at Taif University.

Findings and discussion

This research obtained data from around 24 pages of transcripts. All the interviews were transcribed in ordered to be analysed. Three main themes and nine sub-themes were extracted from the data (Table 2). This section discusses each theme and shows how it contributes to the literature.

Table 2: Themes and sub-themes of data analysis: own table

Sub-themes	Themes
5 years and below	Digital transformation
5+ years	
COVID-19 speed-up	
COVID-19 trigger	
COVID-19 jump	
Employees	Readiness
Infrastructure	
Good support	IT support
Partly supported	

Digital transformation

This theme addresses the timing of the decisions of public organizations in Saudi Arabia to become digitally transformed. The majority of participants indicated that the actual transformation happened within the last five years, although there were plans up to 15 years ago. It is clear that COVID-19 was the trigger for the actual implementation. Participant FTU indicated that the transformation started around 1440–1441 H (2019–2020 CE).

…Since 1440 and 1441...

In fact, there was a direct question in the interviews that asked participants about the role of COVID-19 in the transformation. Almost all participants indicated that COVID-19 was a booster of DT as most organizations had been forced to do it. For example, Participant TE4 said:

I would say during COVID we were all forced to use technology.

Also, participant MTG said:

It has impacted the organization significantly.

Participant ATU highlighted the speeding-up effect that COVID-19 had and how it helped decision-makers to take a decision they would usually be hesitant about.

> I would say it did us a favour when it comes to speeding up the process and solved the issue of fear that we had…

The participant expressed how COVID-19 helped leaders to take decisions related to transformation that they had been afraid to take for many years.

In fact, participant THC3 described it as a "leapfrog":

> Absolutely, it is a leapfrog in the kingdom.

Therefore, it is clear that COVID-19 was a trigger for public sector organizations that decided to transform or were forced into the transformation. This shows an alignment with what has been raised by Kokshagina and Schneider (2023). Although this is positive in that different DT initiatives were implemented, neither the decision-making nor the readiness of employees and infrastructure were as they should be, which can negatively impact such transformations. The next theme will explore this in more detail.

Readiness

As discussed in the previous section, the transformation happened suddenly (during COVID-19), with most participants showing that organizations were not ready when it came to infrastructure and employees. For example, participant STG noted the following:

> I would say the gap between the employees' skills and the transformation, because the lack of the support that was at an earlier stage, there were not enough PCs as well … The organization didn't have a clear strategy … It was a sudden move.

Similarly, participant TE3 said:

> We don't have a good infrastructure; we use our devices and our internet.

As discussed in the literature, DT means new tools, processes, business models, behaviours (Princes et al., 2024), operational procedures, market strategies, organizational structures, managerial competencies, and skill sets (Fernandez-Vidal et al., 2022; Balakrishnan and Das, 2020; Bresciani et al., 2021; Nadeem et al., 2024). This ensures that DT brings changes to organizations, and an unplanned transformation cannot be completed as expected.

Surprisingly, both factors (infrastructure and employees) proved, with time, to be able to cope and to digitally transform, in different sectors. In fact, almost all participants showed that although the

infrastructure was never ready, in every case they were able to make changes to reflects what was needed for digital transformation. Participant FTU claimed the following:

> Honestly, [we were] not ready, but every time you start something you see the weakness you have, so it was important that you begin to understand what they need.

In the same vein, participant THC1 said:

> It [the infrastructure] wasn't ready but every time we make an improvement.

Participant TE2 was asked about employees' readiness, and he claimed that:

> They were not ready and some even didn't want [to digitally transform] until COVID happened, so they were forced but once it was finished they were convinced that it is useful and they have accepted it.

Therefore, participants have shown that the infrastructure was not ready and there were some issues related to the availability of devices, and that employees were not ready to accept or resisted the transformation. As illustrated, this is clearly a part of COVID-19's impact, whereby there was not enough time for preparation. However, this research claims that infrastructure does not have to be ready for DT for it to be a success. The data show that in four years employees and infrastructure have become better able to achieve transformation. However, it is important to undertake continuous

evaluation where strengths and weaknesses are identified in order to establish what is necessary for DT.

IT support

Although employees were not initially prepared, most participants indicated that the support they have received has been appropriate. Various kinds of support were highlighted by participants, including videos, workshops, training sessions, and other materials for supporting employees in a transformation.

Participant TE1 said:
Yes, there were different workshops.

In the same vein, participant MTG said:
Yes, there were workshops and videos.

Similarly, participant TE2 stated that:

There was a lot of self-learning, but we also got some workshops and materials.

That said, it should be noted that there were a minority of participants who highlighted that the support was not up to the required level or that they were more dependent on self-learning.

For example, participant ATU claimed that the support was:

…not enough or as it should be, it doesn't take into account the individual's ability and skills, [it was] way below.

This is clearly related to the ability of employees, as some can learn fast with some types of support and others cannot.

Thus, this research argues that good support during transformation will ease the transformation and help employees to better understand and accept it. This aligns with the literature, where it is highlighted that the adoption of technology could involve a challenge for those who struggle with new technologies and need technical support (Bosch-Rekveldt et al., 2011; Karanasios and Parker, 2017; Princes et al., 2024). Additionally, it is important that the support provided in organizations takes into consideration differences in age, education, and technological background, so that all employees feel supported, which will be reflected in the success of the transformation.

Summary of discussion and contribution

The findings reported here suggest that DT should be studied in order to help achieve its full potential value. In answering the research question, and according to these data, we can infer that the COVID-19 pandemic has influenced DT. Once a crisis happens (e.g., the COVID-19 pandemic), it changes the context for DT and gives organizations no chance to study their decisions. As has been mentioned under the theme Digital transformation, the COVID-19 pandemic is an example of a crisis that forced organizations to digitally transform. This means that organizations did not study this decision or prepare their employees and provide them with the necessary infrastructure. It is therefore likely that a connection exists between crisis and DT, and that the crisis enabled organizations to cope with adopting new technologies.

It seems possible that these results are due to employees taking responsibility. Employees understood that this transformation was important due to COVID-19 and in order for work to be completed. The theme Readiness showed that although there was some resistance and there were some unprepared employees and infrastructure, employees were convinced of the importance of DT. Organizations were also responsible for providing support and continuous reflection, so that everyone was supported and provided with the necessary infrastructure during the transformation, as discussed in the theme IT support. Thus, the contribution of this study has been to confirm the role of users, who are in this case the employees, in the success of transformation, which answers the second part of the

research question. This approach will prove useful in expanding our understanding of how employees play a major role when it comes to technology in that they need to understand the motives of transformation so that they can support it.

Finally, despite its exploratory nature, this study nonetheless offers some insight into conceptualizing DT during a crisis by drawing on SET. The suggested framework (figure 1), which is inspired by SET, shows that when a crisis happens organizations have to take decisions. For example, during COVID-19, they had to enable remote working using many platforms and technology that are all part of DT. This is when employees started to adopt transformation, supported by their organizations. This stage is crucial, as employees need to be engaged and understand their own importance. At this point, organizations and employees begin to develop relational behaviours and trust. Once employees understand their role and its importance, this means that they gain trust and react positively to the transformation. However, organizations should not stop developing these relationships at this stage: this progress should be complemented by sufficient support so that employees can feel more confident and valued. It is believed that this will create even more trust as employees will feel that their organization is supporting them and therefore become supportive of the transformation. Also, this needs to be followed by continuous reflection whereby organizations take the necessary decisions to ensure best practice is followed, and they continually build trust in their employees, which contributes to the success of DT.
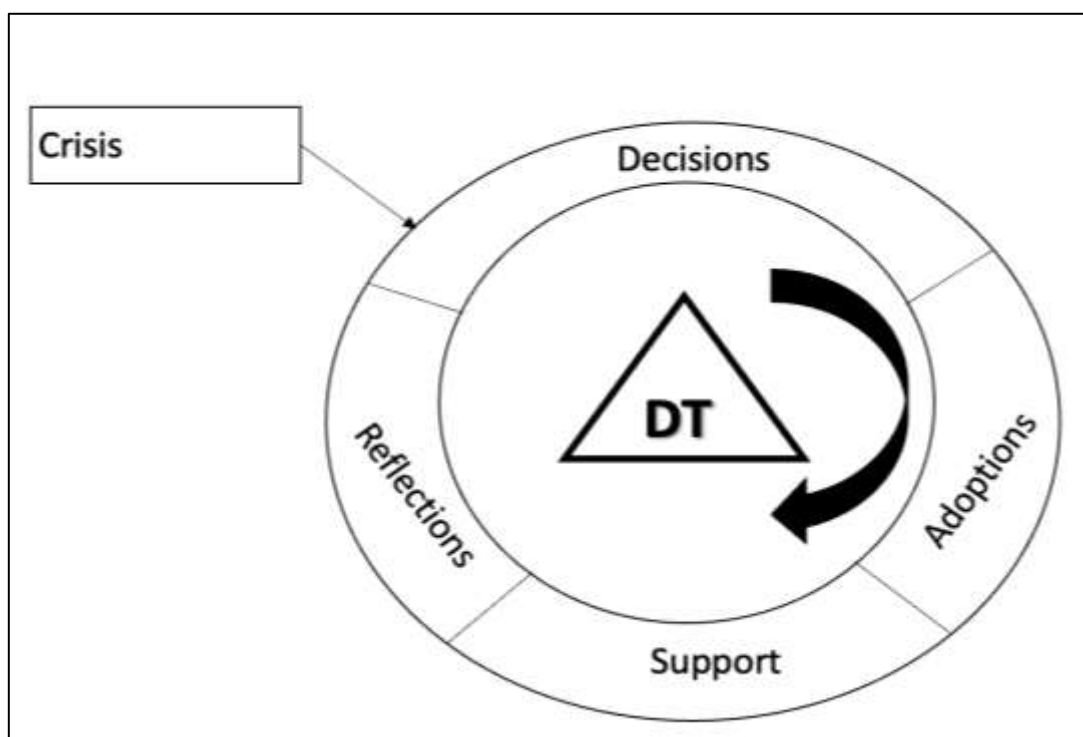

Figure 1: A suggested model of DT during/after crisis: own figure

Considerably more work will need to be done to determine such a framework's validity in different

contexts, settings, and samples. Additionally, more work is needed to understand whether such a model could be applied in a crisis that is global, local, or even internal to organizations where there are urgent decisions to be taken.

Conclusion

This paper has shown that DT brings various types of value to organizations, allowing them to adapt their procedures to better use their resources. However, this also means that it brings changes to organizations that employees have to adapt to. When crisis happens, it is unlikely that organizations will be prepared for such a transformation. This paper has discussed the example of COVID-19 as a crisis that became a trigger for organizations to digitally transform. Four different sectors in Saudi Arabia (health, education, university, and governate) were studied and they have all shown that COVID-19 was the trigger for this transformation. Additionally, they have shown that there were related plans before the COVID-19 pandemic that did not become a reality until COVID-19 happened. What is surprising is that although the infrastructure and employees were not ready when COVID-19 happened, as it was unexpected, entities were nonetheless able to cope with such changes. In the four years since then, entities have trained employees and prepared for better infrastructure. Thus, this research argues that the COVID-19 pandemic has shown that when employees are involved, even when the majority are not ready and the infrastructure is not either, the employees take responsibility and ease the transformation. Future research could investigate the impact of such an approach on transformation when it comes to budget. Such an approach could mean that less money is spent on planning and more on doing; it could also mean that more cost is incurred as a result of poor planning. It is also recommended that more entities and employees be interviewed, for more valid results. Finally, the suggested model could be applied to further cases where it can be tested and evaluated.

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التحول الرقمي والموظفين: ٤ سنوات ما بعد أزمة كورونا

صالح قاضي

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الملخص : يعد التحول الرقمي أحد الظواهر البحثية التي حصلت على اهتمام الباحثين. المنظمات تسعى للتحول الرقمي نظراً للمميزات والقيمة المضافة التي تحصل عليه من خلال هذا التحول. لكن، من أجل الحصول على هذه القيمة يجب أن يكون قرار التحول في المنظمة مدروساً. مع ذلك، حينما تحدث الأزمات، فإن المنظمات تجد نفسها أمام موقف يتطلب سرعة اتخاذ القرار والذي غالباً يكون غير مدروس. توضح الأدبيات أن أزمة كورونا بمثابة نقطة التحول التي من خلالها تحولت المنظمات رقمياً مستخدمةً العديد من الخدمات الإلكترونية التي تسمح لهم بمواصلة عملهم وانتاجيته. يهدف هذا البحث لاستكشاف دور أزمة كورونا على التحول الرقمي خلال الأزمة وعلى مدى السنوات الأربعة اللاحقة. كذلك يهدف إلى استكشاف ما إذا كان هنالك تأثير على/من الموظفين بسبب هذا التحول. لقد توصل هذا البحث إلى أن أزمة كورونا كان لها أثر إيجابي على المنظمات من خلال تسريع عمليات التحول الرقمي والتقليل من تخوف المدراء لاتخاذ القرارات المتعلقة بهذا الشأن. على الرغم من أن كلاً من الموظفين والبنية التحتية غير جاهزين لهذا التحول المفاجئ، إلا أن البيانات الخاصة بهذا البحث توضح أن المنظمات استطاعت أن تطور من ممارساتها خلال السنوات اللاحقة للأزمة. وعليه فإن المعادلة الطبيعية للتحول الرقمي تتغير خلال الأزمات حيث إن المنظمات استطاعت أن تنجح في التحول الرقمي في ظل عدم الاستعداد وهو ما لم يكن يحدث في الظروف الاعتيادية. أحد الأسباب الرئيسية لهذا النجاح هو الموظفين حيث إن الازمة تطلبت من المنظمة التواصل المباشر مع الموظفين واقناعهم بأهمية التأقلم مع التكنولوجيا لضمان استمرارية العمل وانتاجيته. وعليه، فإن شعور الموظفين بأهميتهم يعزز من شعورهم بالمسؤولية وهو ما انعكس على التحول الرقمي ايجاباً خلال أزمة كورونا وما بعدها مما يؤكد على أهمية دور الموظفين والتواصل معهم كشركاء للنجاح ومستفيدين أساسيين لهذا التحول.

الكلمات الدالة: التحول الرقمي، نظم المعلومات، الموظفين، كورونا