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The Impact of the COVID-19 Pandemic on Information Systems Management

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ABSTRACT

COVID-19 can be likened to a seismic event – it does significant shaking, moves the organization around, but in some time, things fall into place and life goes on. Six companies were evaluated to determine the extent to which COVID-19 impacted IS Management in their organizations. The six companies had surprisingly similar experiences in their COVID-19 journeys so far. The companies dealt with the challenges they faced and the IS Management function impacts were minimal.

KEYWORDS

Crisis management; remote work support; cybersecurity; IT Support

When lockdown was mandated for North Texas on March 22, 2020, the populace had 24 hours notice to change their way of work, school, and living. This paper addresses the impact of COVID-19 specifically in relation to aspects of work in Information Systems Management (ISM). Work-at-home became the norm immediately, if it was not already. At the beginning of the pandemic, some companies allowed people with particular illnesses, age-related issues, or older relatives at home to work-at-home. But on March 24, all North Texas switched to work-at-home and their companies scrambled to support them.

Health-care companies struggled to provide both in-hospital information technology (IT) services and at-home IT services, but they made it happen. Other organizations, such as universities, found remote access requests for data stretched their networks very thin and began a scramble to provide services that were augmented with temporary additional cloud support while more permanent arrangements could be made. Many employees, regardless of company-provided IT support, tore their hair out trying to work through the mysteries of virtual private network (VPN) access, multi-factor authentication, and the shift to computer-mediated communication. The faster work-from-home became business-as-usual, the faster the company resumed 'normal' operations. The more staff resisted or fumbled due to a lack of technology savvy, desire to learn, or adequate support, the longer the company took to get to their 'new normal.' Some assumed they would soon return to the office for normality to return and simply stumbled through the early lockdown.

This paper presents the response of six companies to COVID-19, exploring the impact on Information Systems Management. In the next section, the methodology is defined; this is followed by the major areas each company identified, including crisis management, remote work support, and cybersecurity. The discussion section follows the results and compares company experiences from COVID-19 to that of other companies from COVID-19 research. Finally, the conclusion summarizes the research and what might be future research in this area.

Methodology

Following a qualitative methodology, a series of structured interviews were conducted and analyzed to develop the results from a convenience sample of working professionals in IT organizations in the Southwest region of the United States. Six interviews ranging from 40 to 90 minutes were conducted; one was via e-mail. The interviews were conducted over a two-week period from August 15–31, 2020.

The company types included one each of bank, consumer goods, financial services, healthcare, municipality, and security software. The company information is developed from interviews with senior staff from six companies in the middle southern states. Three companies are international; two are national; one is local. The participants included a senior software service analyst, data manager, sales engineer, senior architect, senior operations manager, and IT manager.

Interviews were coded using techniques from Saldaña (2016) for elemental and procedural coding. Then, the interviews were re-read to determine secondary levels of coding. Next, the interviews were compared to determine similarities across the respondents. Themes were

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identified based on the similarities. The themes determined the topic areas of the discussion of results.

Results

The interviews reflected the individual's position in the organization so though all addressed the overall ISM theme, they were shaped by their organizational position. The three main themes are crisis management, remote IT work support, and cybersecurity.

Crisis management

Crisis management refers to a number of topics, including organizational financial stability, business continuity, staff safety and health concerns, staffing adequacy, and business risk. Every organization went through the same crisis concerns relating to stabilizing the business first. The two major concerns in that regard were financial and managerial. Financial concerns were revenue, cash flow, and cash reserve related. As financial concerns were being addressed, another management group was ensuring staff safety and health.

As work-at-home stabilized, staff adequacy and need were evaluated with respect to financial issues. The healthcare company mandated personal time off. In addition, they furloughed 20% of the staff with the lowest performance appraisals to ensure financial stability. They did provide 'furlough pay' at a reduced salary. The consumer products company permanently closed a 120 person-facility (10% of staff) that had been hit by COVID-19, following a month-long complete closure due to internal virus spread. In contrast, the security software company determined their staff was becoming disengaged from extensive overtime, the CEO gave the entire company a week off with pay over the Fourth of July.

In terms of business continuity and business risk, the concerns were similar: companies did not feel prepared for the crisis, the move to work-at-home, or the demands it placed on the business. Business continuity plans were not drawn for complete staff outages in, e.g., New York City for the bank. The Sr. Architect said that once everything was moved and they were successful in backing up their unavailable counterparts, the teams involved felt that much stronger, but they also knew a redesign of crisis and recoverability plans was needed. The crisis, for the bank, led to high morale and high productivity with a number one ranking in paycheck protection program loan processing, and a knowledge that all planning for disasters, continuity, and risk needed to be redone.

Remote IT work support

Many companies already had people who worked at home at least part-time, but two companies, one in healthcare and one in consumer goods, did not. In addition to those whole companies, in the other companies, people with no work-at-home experience, and those with children who also struggled with online learning at the same time, had to work the hardest to learn the new technologies and how to deal with computer-mediated communications. Concerns about remote work included IT Support sufficiency, business communications, and staff productivity.

IT Support includes both crisis and ongoing support. In crisis mode, IT Support relates to tasks required to deploy hardware and software sufficient for all company employees to work-at-home and ensure operational uptime at the base datacenter supporting IT operations, including services usage support (help desk and provisioning). Ongoing support includes services usage support and ongoing operational datacenter uptime as well as troubleshooting, training, etc., for the hardware and software deployed. Continuous evaluation and deployment of hardware and software may be required if some product does not perform as advertised; thus, the support is an ongoing activity.

Organizational maturity refers to the extent to which an organization defines and documents processes, trains its staff for use of the processes, actually follows the processes, measures use of the processes, and follows up on the metrics to monitor the behavior and correct misuse of the processes ([Blokdyk, 2018]). Five of the six companies were at level 3 maturity in the U.S. (Blokdyk, 2018) and had their companies moved off-site within three to six weeks. No new hardware or software purchases were required to accommodate for COVID-19 work-at-home. While some people needed training, the IT Support organization was able to provide it. The process was treated as a 'normal' activity.

The consumer goods company differed from the other organizations and was at a level 1.5 (Blokdyk, 2018) maturity in the first quarter of 2020. The IT and Cybersecurity Managers were in the process of testing new policies and training people for new security processes, but the training was interrupted by the crisis. On-the-fly assessment of remote user capability, licenses, software, hardware, and internal server bandwidth limitations were needed to ensure that everyone was up-to-date and that they complied with company policy. Those employees needing upgrades were changed. In addition, all employees needed added software to use remote communications, collaboration, and virtual private network software added specifically for work-at-home

computing. While the network and IT infrastructure were more than adequate to support work-at-home, the staff learning curve for new software, new processes for the software, and computer-mediated collaboration took between four and five months for the whole company to become comfortable with the new way of working. By the end of July, the IT function had achieved a level 3 maturity in having documented processes in which the staff was fully, virtually trained and were following the new processes successfully. Metrics were not deployed but were being designed for a new dashboard to be rolled out by the fourth quarter, 2020.

The bank had an interesting remote work support issue in that it was the only company to have a problem moving to work-at-home for staff in India. Some staff lived many miles from work, and had neither internet access nor equipment. The company had to obtain land lines to obtain access and provide equipment to resolve the problem. No other countries posed problems.

In terms of communications, most non-IT users in all of the companies had to learn VPNs and the on-line communications software used in their company, such as Zoom, MS Teams, or Skype. Successful remote technology use requires not only the ability to implement basic connective functionalities, such as joining a Zoom meeting, but the mastery of new etiquette for signaling you want a turn, signaling when you are done, chatting on the side, whether or not you show your face and the implications, recording meetings, and so on.

The other remote work concern was staff productivity. With the exception of financial services, all companies reported that once initial work-at-home problems were resolved, productivity was on par or better than at in-office work. They believed it was at that level because there were fewer breaks, less socializing, longer work hours, no commute, lunch at the desk, and less work-life separation. The bank also had the success of moving New York City work to other locations without a prior plan that energized those involved in the move.

The financial services company found "cracks in their people, processes, and platforms." Internet circuits were strained and some 'sneaker-net' processes were uncovered that had to be redesigned to work virtually. Collaboration platforms had to be scaled up and improved. Performance slipped and needed adjustment; performance reviews became more frequent. Some good came from the changes as meetings were reevaluated and those found to be unnecessary were eliminated and many regular long meetings were replaced with 10-minute 'stand-ups.' The financial services company also began a regular series of 'social hours' late in the day for employees to bring a cocktail and just talk about non-work topics. The combination of changes seemed to improve productivity and morale. "While innovation and strategic initiatives slowed down at the beginning of the pandemic to allow for the adjustment of our people, processes, and technologies, projects quickly built up momentum and have generally reached parity with the level seen prior to the pandemic." Thus, for this company, after an initial productivity hit, the company went back to normal.

The financial services company changed its attitude toward bringing in new technology and inter-company collaboration, reducing both. "The number of 'game changers' became less than previous years and the appetite to introduce new technologies decreased … the appetite to achieve greater value from assets we already have increased, and transformation projects focusing more on wholistic approaches … to achieve faster time to markets and increased stability" became the norm.

The attitude that this was not a time for new technology was mirrored throughout the companies as every company either slowed (Healthcare), delayed (Municipality, Healthcare), or stopped (Consumer Goods, Municipality) new technology projects. The exception was the bank, which had funded several artificial intelligence (AI) projects in 2018, deployed a successful AI tool in late 2018 and significantly increased the funding at the end of 2019. They continued their development with no changes.

Cybersecurity

Cybersecurity was already robust in five of the companies as they included tier 1 and 2 companies. However, all the companies reviewed their risk profiles, identifying COVID-19-related risks and augmenting security specifically for work-at-home to prevent incursions because of their company types and COVID-related attack attempts. At the time of the interviews, no companies had experienced security breaches. However, as the financial services manager stated, their risk models were constantly being adjusted and the "word 'unprecedented' seemed to be thrown around like candy [with] systems that utilize predictive algorithms adjusted more often to account for uncertainties." This sentiment was seconded by the Sales Engineer who worked for a security software company. The consumer goods company increased their security to accommodate their work-at-home staff.

Discussion

In this section, the companies are compared to other COVID-19 research. The major issues confronted by the companies – crisis management, remote work support,

and cybersecurity – were consistent across the companies but details within the issues differed on emphasis. The healthcare and consumer goods firms struggled the most financially, while the others thrived. The bank got a clear message that their continuity and risk plans needed an overhaul and felt unprepared for some of their crisis activities, such as moving all New York City work to other locations. The crisis issues addressed by these companies aligned with those of 320 companies surveyed by KPMG May 20-June 8, 2020 (KPMG, 2020a). Financial performance, liquidity, and access to capital with 93.1% of respondents identifying it as their highest concern was the most important issue (KPMG, 2020a).

The companies in this research response group did better than the KPMG sample in that when asked to choose areas of operational changes required by COVID-19, all of the answers were non-issues for all but the consumer goods company. Employee health and safety was first with 42.2% of the responses; business continuity was second with 38.1% of the responses; and remote working was the third area most in need of change with 35.9% of the responses (KPMG, 2020a, p. 6). The changes needed in the consumer goods company were not delayed; they were conducted as remote work was being provided. Metrics should be complete by the third quarter of 2020, bringing the consumer products company to Level 4 maturity. Thus, all of the companies in the research sample surpass the KPMG sample as of this writing.

For remote work, IT support, business communications, and staff productivity were important. For IT support, service/help desk, troubleshooting, provisioning, hardware and software deployment, training, and support all were included. Five of the six companies had no real issues in these areas. The consumer goods company had no processes in place at the time of the lockdown and struggled to cope with all of the needed hardware and software changes, in addition to training, process design, security upgrades, and network upgrades needed to provide for work-at-home. The consumer goods' work-at-home program took about five months to stabilize. As stated above remote work and IT Support were not an issue and, to the extent that it was in the consumer goods company, it was resolved as remote work was being provided.

Virtual communications use was on MS Teams and Skype in four of the six companies, Zoom in the municipality, and Skype/Webex in the Bank. Other than learning software and virtual etiquette, no companies had any issues with this. Use of communications included meetings, collaborative work, and socializing.

The third remote work concern was staff productivity. Five of the six companies reported higher productivity than when staff were at work. The financial services company had found issues and altered processes, stopped having long meetings, started having 10-minute meetings, initiated socializing meetings, and increased the frequency of performance reviews.

According to Gallup reports (Gallup, 2017) by 2016, 43% of the U.S. workforce worked at home and, on average, 33% of the workforce was engaged by their work. Research positively relates engagement with productivity (Barik & Kochar, 2017). This would imply that the sample of companies in this report are not the norm because they all reported that productivity was no less than acceptable and two of the companies (bank and financial services) reported productivity higher than in the office. Every company in this research was 'hitting their numbers;' the municipality did not discuss revenue, being driven by tax income.

In terms of IS impacts, the financial services company stopped bringing new technology into the company, opting instead to get more value from the installed asset base. The healthcare and municipal organizations slowed projects. The bank and cybersecurity saw no change to the pace of development or implementation expectations. New technologies were not introduced but existing technologies were continued at the same pace, including AI. KPMG (2020b, p. 12) reported that between 25% and 35% of 900 companies surveyed planned to decrease spending on 'required to compete' technologies such as blockchain, process automation, and AI in the next year while 32% to 44% of companies planned to increase their spending on the technologies. These changes made the companies in this research equivalent to the KPMG sample.

This research is hampered by only discussing six companies, all in different industries. In light of the findings from this research, future research should look more systematically at more companies in evaluating their work practices, specifically crisis management, risk management, and specific actions taken during the changeover from office to work-at-home. Either a larger case study or a survey could be undertaken. An opportunity for research of the move back to office work would also be interesting as the contrasts of the freedoms of work-at-home to the strictures of work-at-office and commuting life might alter some of the findings in this report on productivity, communications, and even management.

Conclusion

Companies under mandated lockdown for COVID-19 had 24 hours to shift to a work-at-home mode of operations in March, 2020. The six companies interviewed all were successful but ranged from three to 20 weeks in accomplishing the task. The IS Managers and their organizations showed resilience and the wherewithal to move forward to get their jobs done successfully and help their companies get back to normal operational status. When compared to other companies enduring the same difficulties, these six companies have performed well and survived effectively. The impact of COVID-19 on the IS functions for these companies was minimal.

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Notes on contributor

Sue Conger has a BS in psychology from Ohio State University, an MBA in finance and cost accounting from Rutgers University, and a PhD in computer information systems from New York University. Sue is on the University of Dallas faculty where she manages the Information and Technology Management program. She has authored three books; is active in the AIS, EURAM, ACM, IEEE, AoM, ITSMF, and SIM; and has taught in New Zealand, South Africa, Mexico, and Finland. She has over 30 journal articles, over 30 book chapters, 80 conference proceedings, over 100 conference presentations, and many invited talks.

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