Aligning the Information Technology Leadership with the Organizational Working Environment Changes During the Pandemic Crisis: Case of a Large Swedish Medical Institute

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Abstract
Covid-19 virus hit the world in an unprecedented and cruel manner. Lives were changed forever, and organizations had to find a different strategy to handle the consequences of the virus. Employees were forced to leave the office and work from home in order to reduce the spread of the infection. This ultimately led people having a hard time managing work and life balance. This research explores the drawbacks of the work-from-home format by conducting a case study on a medical institute in Sweden where information was collected and analyzed to help answer the research question which is how leadership and management in IT companies have changed during the pandemic. This organization is a very large medical institutes and were practicing organizational challenges in the IT department during the pandemic. We found three themes that were most discussed by the employees during the interviews: Ergonomics, infrastructure and IT leadership strategy. These three aspects of work from home environment using the new technologies were challenging and complicated to address on time by the top managers since they were not prepared for such crisis.

Keywords
Pandemic, Information Technology Leadership, Organization, Change

1. Introduction
1.1. Background

The year 2020 will forever be known as the year that the earth stopped moving. From a seemingly harmless virus to a deadly disease, the perception of the world as we know it would rapidly prove to be wrong [1]. The Covid-19 pandemic struck every part of the world and left the population wondering as to when life would resume to normal. Social distancing and lock-downs all across the globe was the new normal. Organizations in different industries were massively affected by this which led to losing money and ultimately resulting in millions of employees losing their livelihood. Some companies were permanently shut down while some are still recovering from the pandemic [2].

The pandemic hit organizations hard and in a way that put a stop to daily activities. This meant that changing company structure and strategy wasn't a matter of if but when. Covid-19 left thousands of company executives stranded with some of them even filing for bankruptcy as a result from non-existent sales and loss of revenue [3]. Non-essential workers were told to work from home which meant that changes had to be made in company strategy and daily routines should be restructured in order to keep employees safe from potentially contracting the

disease [4]. The result of this is modifying technology and infrastructure to meet the criteria of not having employees in-office.

As organizations change the way they handle prior challenges, a number of new obstacles have been set ahead of them during the pandemic such as communications with clients or project time forecasting. Covid-19 had forced companies to create a foundation for upcoming challenges in the coming future [4]. The Work From Home (WFH) way of working is one of the big changes that organizations had to make to cope with the repercussions of the Covid-19 pandemic. This forms a big challenge as big parts of companies' infrastructure need to change. The use of digital tools such as Zoom, Skype and various other platforms continued to grow and has been growing over the last year with about 20 million new users from 2019 – 2020 [5].

The pandemic has left its mark on the world and produced a number of problems that organizations had difficulties coping with considering the time pressure following the vast and sudden outbreak of the virus [6]. This meant that companies had to prioritize developing new strategies to enable a work-from-home environment that worked for both employees and management.

1.2.　Research Problem

One of the many obstacles that tech-companies now have to get by is the ability to handle the consequences of Covid-19. The fact that companies are now faced with developing and improving tech-infrastructure and information systems puts a stop to main operations to now having to tackle a different challenge. Organizations now have to redefine company structure to keep the business alive. This meant that firms were responsible for ensuring that collaboration between employees was able to function as normally as possible [2]. However, with remote working being the new standard, collaboration in association with remote working is difficult to achieve [7]. With that being said, inadequate infrastructure will only lead to even more challenges. Support from management is vital despite the progress made in the field of technology [8,9].

Therefore, this research aims to address the following research question: "How does the IT leadership align with the organizational working environment changes in the aftermath of the Covid-19 pandemic?"

1.2.1. Challenges of Information Technology Leadership

In this section the concepts used in this research are presented, these are the concepts used for data collection and analysis.

IT leadership is "the process followed by an organisation's top IS executive to influence other people within and outside the IS department to attain the department and organizational goals" [10].

Numerous businesses invest a lot of resources and capital in information systems which unfortunately does not always secure a return of that investment [9]. This type of unrealized opportunities lead to organizations raising questions about the way they manage information systems in the organization's daily activities. When speaking about the field that is Information Technology, you easily end up focusing on the technical components that a system consists of. But too many times, people tend to miss another factor that plays a crucial role in IT which is IT leadership [10]. Leadership is in its own way an integral part of an organization and is critical to any group environment. Thite [10] stresses that the importance of leadership is actually a critical success factor. The skills needed to manage employees and to maintain a well-oiled organization is essential. The emergence of hybrid managers that can combine abilities are becoming increasingly popular.

1.2.2. Organizational Strategy

The term organizational has been widely discussed in different ways in different organizations. One organization may view OS as a way to describe business vision, goals or objectives [11]. Other businesses may think of OS as a way to communicate between members of the organization to give meaning and context to employees. OS can be defined in many ways. Furthermore, it is equally important to understand that an organization may not operate on only one single strategy but on numerous strategies depending on what part of the organization you are referring to [11].

1.2.3. Challenges in Remote Work

The pandemic has led to numerous organizations looking to explore different options of company strategy and structure to keep the business alive during Covid-19. Social distancing has created a working climate where employees have had to work from home for an extensive period of time to keep the virus from spreading in the workplace and therefore affected organizations while trying to maintain a functioning company structure [12]. The economic impact of Covid-19 has created a new way to interact with people in the workplace in a way that will influence the future. That is, companies will have to adopt and implement a new business process to meet the demands of social distancing and the work-from-home practices. Various organizations have been forced to close down as a result of lacking capacity and resources to invest in such a working climate. Meaning that organizations now are obliged with finding new and smarter ways for employees to be able to communicate with one another without a negative impact on daily activities. Cloud-based infrastructure and upgraded information systems have become a necessity to keep business alive [12].

1.2.4. Ergonomics

This set up of work-from-home leads to a work-life - home-life conflict that often is a complex problem to resolve. This is the result of working from home as work infringes into employees' personal lives by forcing them to work unpaid overtime and experiencing fatigue [13]. This is especially relevant to the pandemic situation as work is always close at hand [14]. This has to be taken into consideration to how it will affect ongoing operations for an organization depending on employees psychological and emotional stability.

1.2.5. Leadership in Remote Work Environment

Leaders know the organizational goals and vision better than anyone else and should manage the virtual aspect of the daily operations better than anyone. Leaders and management are tested in how they manage to overcome the requirements of showing task-and relation-oriented leadership [15].

This skill set is required to keep managers trust in their employees in a WFH-environment. The now outdated face-to-face type of managing has transitioned into a monitor-from-afar way of conducting business and daily activities [16].

1.2.6. Security

Another concern for IT-companies was to make sure that security was highly prioritized as an organization under stress and pressure is susceptible to attacks from outsiders and unauthorized persons. This turned out to be a major issue for the reason that about 18 million scam emails were stopped by Google per day to protect individuals [8]. This was and is something for organizations to think about when implementing remote working. The right software to ensure privacy needs to be developed which leads to additional costs for already impaired companies. This goes on until companies can make sure that device encryption is established to ensure no potential security breaches [2]. This is vastly important especially if your organization is dealing with sensitive information about clients.

1.2.7. Organizational Crisis Management

Kuzmanova [17] explains that crisis management is not only connecting with the action taken during times of crisis; but the aim is to improve the awareness of existing crises. Following few stages listed below could help improve the understanding of the evolution of crisis management.
- First stage: emergence of an unexpected crisis situation. The manager's organizational skills and his stress resistance are of key importance in this situation. Practice shows, however, that the aim of crisis management cannot be limited only to the survival of the organization.
- Second stage: crisis management entails coordinating activities aiming at preventing crisis, cushioning the severity of the crisis and eliminating its negative consequences.

- Third stage: the prevalent argument is that the efficiency of crisis management depends primarily on identifying the crisis on time and the prompt response of the organization. Therefore, crisis management has to identify the crisis, plan the anti-crisis actions and conduct anti-crisis measures.
- Fourth stage: enhancing crisis management at the expense of forecasting and preemptive functions, development of crisis strategies, which include eliminating the negative socio-economic consequences of the crisis [17].

2. Research Method

This study aims to answer the research question: *"How does the IT leadership align with the organizational working environment changes in the aftermath of the Covid-19 pandemic?"*

A case study is used to answer this research question, this research method is fitting for this study because studying a specific phenomenon in a given context is going to give this research valuable information that will help us understand and ultimately answer the research question [18].

The case study will mostly focus on Karolinska Institute (KI), one of the world's leading medical universities established in 1810 in Stockholm, Sweden. During the pandemic, IT section of the organization have been forced to work remotely, mainly because of the Covid-19 virus spreading all over the city.

By creating interview questions that are relevant to the subject (the interview guide is attached in Appendix A). The interviews were semi-structured since this topic is rather new and the authors wanted to cover every question that may come up duration the interviews to get a comprehensive view of the under-study phenomenon. There were 4 semi- structured interviews done and the participants included an IT specialist, IT technician and the CIO (Chief Information Officer). These participants work in the IT department and support different systems provided for education, mainly odontology, scientists and clinical activities. The interviews were done over video calls during June 2021 and each took around 60 minutes. The collected data were then analyzed using Thematic analysis by creating codes, categories and themes based on the concepts found earlier in the literature using thematic analysis instructions from [19].

3. Results and Analysis
3.1. Ergonomics

in the case study was that most of the complaints from the staff were directed towards the work environment rather than the actual change of information systems, i.e software that was used. What this comes down to ultimately is that staff and leaders have a different way of perceiving change and different ways of experiencing change as well. While managers have a lot of responsibilities, the staff are the ones that ultimately are subject to change and are more likely to react strongly to that change. If there is an economical reason behind it is hard to say but oftentimes, managers make substantially more money than regular staff and have a better prerequisite to handle these kinds of sudden changes [16]. That may be having more money to spend on a home office which can be a catalyst for higher levels of motivation and ultimately effectiveness. It is quite clear that this organization didn't really help to motivate their employees by giving them the proper tools to handle working remotely. While this may be a question of cost and resources, managers and organizations alike should make that effort to treat their staff with the right prerequisite to enhance the ability to work from home.

3.2. Infrastructure

According to the IT manager of this case, the organization has partly been affected in a way where different jobs take longer time, many of the employees are working from home which has a bad effect on the communication between different characters within the organization. Reaching out with information or trying to gather information from someone he says is much harder; *"Before you could just knock on the person's door"*. The pandemic is slowing down different processes within the organization. During the pandemic situation KI have been using "Zoom" and "Microsoft Teams" a lot, they are saying that the IT of the organizations have developed since people have been forced to use specific systems during work. According to the employees of KI they are saying that the majority of the members of the organizations aren't very comfortable with using new IT systems that were provided during the pandemic and at the same time they weren't ready for the problems that were

waiting with the new implemented changes. Meanwhile, the notion of always having to call or email a colleague was another factor the staff was dissatisfied with.

3.3. Leadership

Meanwhile, managers are left with the task to still maintain a company structure and strategy while having to implement a different way of working [12]. The IT-manager in the case study did also mention that his own job has not been affected in a significant way. Along with the notion that the overall performance has not changed, he states that he has not micromanaged his staff to make sure that they are actually working. What that means for the parties conducting this study is that the communication between the manager and his staff has not been sufficient enough. Managers have a lot of responsibility during change and because the pandemic caused an almost immediate change, most organizations were not prepared for the consequences. The IT-manager at this department reluctantly changed his strategy towards the employees:

"I really didn't want to change that much because the staff were used to working in a specific way and I didn't want to be the one to change that completely. In the end, that was inevitable because we had to make sure that everyone was comfortable with, from that point, working in different environments. But even then, it was really tough to ensure that communication was flowing and that the staff were motivated enough. The pandemic struck us in a way that was hard to deal with" (Interviewee 1).

Meanwhile, managers know the organizational goals better than most and are subsequently forced to implement new strategies and are faced with the responsibility of making sure that the new strategies are easy enough for everyone to handle. To be prepared for change is what ultimately makes or breaks an organization. Of course, it's very difficult to prepare for something like the Covid-19 pandemic but as managers of organizations, you should always have a plan or some kind of routine for these kinds of events, no matter the size of the crisis.

To summarize the findings from this case in reaction to the pandemic and work from home environment and change management, the following issues can be listed in three main themes:

- Ergonomics:

  - No proper work equipment, such as desks and chairs available.
  - Investments for a better home office could have a good impact on the thoughts about working from home.

- Infrastructure:

  - The pandemic is slowing down different processes within the organization, mainly because of communication.
  - Issues and overloaded online services. This have been a problem for employees.
  - Organizations are investing and have goals to make it easier for employees to work from home but for the IT department of KI this hasn't been the case, the remote work hasn't been beneficial according to the staff.

- Leadership strategy

  - Hard to ensure that communication was flowing as it should.
  - Difficult to make sure that the employees were motivated.
  - They were not ready for the consequences (switching environments, implementing new systems for their clients etc.).

Table 1 presents the themes and codes derived from the interviews analysis leading to the final results of this research.

Table 1. Themes derived from the data collected from the interviews

Themes	Categories	Codes
Ergonomics	Working from home Working on site	Bad ergonomics. Bad quality of work. Less productivity. Easier to communicate. Better quality. Reaching out to others is easier.
IT-infrastructure	Changes Challenges Quality Communication Effect on staff	Use of different software. Lack of communication. Worsened quality of work.
Strategy	Capabilities Plans Difficulties Skills	Organizational structure. Change of company strategy. New challenges. Leadership skills.

3.4. The effects of pandemic on the IT department

In this specific case of IT department of Karolinska institute, the instant consequences of the pandemic were clear and obvious. Numerous organizations were forced to completely change the outlook of their business. While some managed to minimize the damages caused by the virus, other businesses failed. The outcome of this was sudden changes in nearly all aspects where organizations were forced to change multiple years of conducting business the same way. The idea of not adapting to the pandemic is now long gone and businesses have basically been forced to restart with new strategies to survive. The case study found that the most general problems the IT-department faced were to collectively change routines and the way most of the staff work. Working from home was clearly a problem but the bigger issue was in what way this was to be implemented. All of a sudden, managers now have to consider and prioritize different factors in order to make it easier for the employees. This was not always the case with this department because the majority of the staff felt like they were not supplied with the adequate tools to make it work. The problem is not change in itself but the sudden change to something completely different. There are also other aspects that got affected by the pandemic in this organization including: effects on digitalization decisions in the organization and effects on the staff adapting to new decisions.

4. Conclusions, limitations and future Research

The purpose of this research was to study the effect of pandemic and work from home on the information systems leadership in organizations. In nearly every corner of the world, the pandemic has caused sudden changes in every aspect and almost terminated most people's jobs leaving them unemployed. This research is meant to highlight the structural changes and company strategies that businesses have been forced to replace due to Covid-19 in the IT department of a large health care institute. The study is aimed to answer the question of in what ways leadership and management have changed during the course of the pandemic in the IT sector with the title: "How does the IT leadership align with the organizational working environment changes in the aftermath of the Covid-19 pandemic?"

While this is a fairly new phenomena, the consequences have to be studied to make sure that organizations are more equipped to handle these kinds of catastrophes. This research was formed to examine the effect of Covid 19 pandemic on the way IT departments work and the changes in their working environment they had to make. The problem that this study aimed to solve was to what extent Covid has had its effect in the IT sector and more specifically in the way of working in the IT department of a large organization. In what way has change been

manifested? According to the case study that was conducted, one of the major changes were remote working and changes in infrastructure i.e. new software to eventually learn how to use. Now if you implement the collection of data from the case study to a broader scope, it will most probably show bigger changes than before. Considering the magnitude of destruction, the world has faced during these few years of the pandemic, one can just imagine how much more there is to study and research.

By conducting a case study and four interviews, this research managed to find some information that could possibly answer the research question. The collected data showed that employees of this department showed dissatisfaction in bigger parts of the company. Meanwhile, there certainly was more information to gather by studying a bigger part of the organization but the research still managed to find useful information to paint a bigger picture of the problem.

The results from the case study and the interviews showed that this department was lacking in different aspects and that the employees reacted negatively to the changes that were applied by the managers. We found three themes that were most discussed by the employees during the interviews: Ergonomics, infrastructure and leadership strategy. These three aspects of work from home environment using the new technologies were at some points not very well addressed by the top managers since they were not prepared for such crisis. The results of this research can be used for the organizations facing similar situations in order to have less costs and improve their performance and employee satisfaction during a crisis.

There were also limits in this study regarding the interviews and collecting data. While interviews are fairly simple to conduct through video calls, the authors wished to have more interviews with more employees, however they were not all willing to speak about the issues. Also, there was not so many other cases done that the results could be compared with, since this research was done when the pandemic were still an unsolved issue and there were not a lot of data available from other organizations experiences.

Future research could involve case studies on bigger departments in different organizations and it would be rather interesting if the research could widen the scope and study organizations internationally because the pandemic has indeed affected all corners of the world. These kinds of studies could use a broader scope, whether it be a bigger department or a different organization in another business. Furthermore, studies that compare businesses is preferable because it can lead to better understanding and result in more information that can ultimately lead to organizations making the right decisions based on the whole of the company rather than to cater to those with the biggest interests.

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Appendix A: Interview Guide

Intro Questions
What is your role in the organization?
How long have you worked in this role in the organization?
Who do you report to and who reports you?

Organizational structure

What was your organization's approach to the outbreak of the pandemic?
How has your work been affected by the pandemic?
Did you eventually work from home? If so, how did you feel about working from home? /How did you feel about still working on-site?
What changed in the way you worked when you moved off-site?
Did you prefer WFH or on-site?
Did you feel an increase or decrease in the quality of your work?
What type of information system did you use off-site? How did you   communicate with your colleagues?
What software did you use in your work?
Was there a change in software WFH?
Was there a change in company or organizational structure and strategy?
How did the managers change their style of work when moving to a WFH environment?
Did you as an employee experience any changes in the way managers managed the team during WFH?
While WFH, did the organization invest in you to achieve better ergonomics while working from home? (Did they supply you with adequate equipment for you to do your job the best you could?)
Have you experienced any difficulties with the current structure, tools of software?

Organizational strategy
What capabilities do you need to achieve success?
Were there any changes in strategy after the outbreak of the pandemic?
Did managers face any difficulties coping with this new strategy?
Did you add strategies or replace existing ones?
If so, how did you adapt to this new strategy?

Organizational change management
Changes within business are very common and often come with change   management mistakes. How do you avoid mistakes? Were there any changes in management after the outbreak of the pandemic?
How did managers communicate with their staff?
Did remote work come with challenges for managers?
Did you try to minimize the consequences of immediate change for the employees?
If so, in what way?

What factors did you consider when implementing an eventual new strategy?

Leadership strategy
How will you measure and track performance to ensure impact?
Did your management skills change during the pandemic?
How did you motivate the employees?

Security
What is your biggest security concern within the organization?
Did you face any difficulties in security working from home?
Were there any invasions of privacy working from home?

Organizational crisis management
Have COVID19 affected your organization in a negative or positive way?
How will your organization ensure the well-being of your employees? Does organization have any type of model that explains how to handle them?