Strategies for transforming the traditional workplace into a virtual workplace in smart cities

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Abstract
Virtual workplace adoption has created many challenges as well as excellent opportunities for organizations. The purpose of this study is to implement a business digitalization strategy so that micro, small and medium enterprises intending to adopt virtual workplace can use as guidelines. To help managers address this challenge more systematically, we describe how organizations successfully adopt virtual workplace in smart cities. Most existing studies examined the role of virtual workplace on business performance and worker productivity. We focus specifically on the implementation strategies as the under-researched areas of academic inquiry. We adapted the 11 strategic questions from the study of Hess, Matt, Benlian and Wiesböck and provide possible answers from various relevant studies, so mangers can use as guidelines when formulating a virtual workplace strategy.A survey of the literature was conducted and relevant study results providing the implementation guidelines for adopting the virtual workplace are presented. Findings from the research can help managers better understand the successful implementation of the virtual workplace. Because transforming traditional workplace into virtual workplace brings challenges and as well as opportunities, it is important for managers to understand them completely in order to eliminate the risks and increase the favorable effects.

Keywords: adoption, digitization, implementation, guidelines.

1. Introduction
Rapid innovation can be essential to an organization's survival in today's hypercompetitive business environment. To provide the required creativity, a new breed of worker is emerging. These sophisticated workers will expect an environment that attracts them, meets their needs, and provides an incentive for them to stay. The concept of "smart city" has grown in popularity in scientific literature and international policy over the last two decades. The urban growth and city population are growing at a fast pace causing different issues to the environment, economic and social sustainability of cities [1][2]. To grasp this concept, it is necessary to first understand why cities are regarded as critical components of the future. Cities play a critical role in social and economic aspects around the world, and they have a significant impact on the environment [3]. Many definitions of smart cities exist.

A range of conceptual variants is often obtained by replacing "smart" with alternative adjectives such as "intelligent" or "digital." The term "smart city" is a nebulous concept that is applied inconsistently. There is no single template for designing a smart city, nor is there a one-size-fits-all definition of it. The term was first used in the 1990s. At the time, the emphasis was on the significance of new ICT in terms of modern city infrastructures. The California Institute for Smart Communities was among the first to focus on how communities can become smart and how cities can be designed to incorporate information

technologies [4]. [5] debated the new urbanism and smart growth concepts for dealing with city problems, particularly environmental, housing, and citizen well-being issues. According to [2], smart cities are "locations where traditional networks and services are made more efficient through the use of digital and telecommunication technologies, for the benefit of its inhabitants and businesses."

The focuses of smart cities development are improvements in citizens' life [2], environment efficiency, security, and sustainability [6] [7] with centrally controlled and monitored technological infrastructures. Several new workplace paradigms have emerged in recent years in response to technological advancement and the ever-changing socio-economic challenges such as the virtual workplace. Introduction of the virtual workplace has brought about a complete restructuring of the organizational workplace in the last decades. Emergence of the virtual organization paradigm falls in the natural sequence of these restructuring processes, enabled by the “explosive” developments in the information and communication technologies. It is imperative that organizations remain relevant in the constantly changing corporate world, this means organizations must evolve with the constantly changing nature of work.

The traditional workplace is characterized by employees who congregate together in the same physical space for at least 40 hours per week during the weekdays to produce work for a business. This work leads to maximizing shareholder value for profit, providing services, and helping to make the world a better place in a non-profit [8]. The power flows from top to bottom in a traditional workplace; rank-and - file workers are seen as cogs in the organization and must implement choices for which they have no input. But a cultural revolution in the workplace has revised a traditional company's tenets and adopted a distinctly different contemporary organizational framework. And, while many businesses continue to operate in a traditional manner that provides control and stability, contemporary organizational design, in which employees are given the power and autonomy to make decisions and implement changes, is becoming more popular [9].

An ability to embrace continuous change and respond rapidly with innovative products and solutions is vitally important in an increasingly dynamic business environment. Organizations that ignore the changes in work patterns, workforce and work environment are likely to find themselves at a considerable disadvantage from which it will be difficult, if not impossible, to recover. The traditional workplace needs to respond to this demand for rapid innovation, by becoming more flexible, distributed and collaborative. In response to this demand for rapid innovation, traditional work has become more flexible, distributed and collaborative.

2. Literature review

Working models have evolved and changed over several decades towards flexibility and mobility. Smart cities are witnessing the emergence of alternative workplace models such as remote work, coworking spaces, digital working hubs, and on-demand spaces. This trend toward a flexible working environment inevitably is a significant impact on the economy and environment, as well as future urban design/planning. Along with the changing work environment, the organizational structures, character of the workforce, and tools used to do

work are also being updated [10]. Virtual workplaces are being adopted in corporate real estate management, providing further agility and flexibility for larger corporate organizations, and achieving higher densities and utilisation rates [11]. It is considered to improve the exchange of knowledge among members, and foster more collaborative practices that can drive innovation [12] as well as cost savings [13].

Flexible work environments such as virtual workplaces play an important role in contributing to reducing traffic congestion by assisting with travel demand management. The studies of [14] on various workplace-sharing programmes to explore how coworking and travel behaviours interact suggests that adopting virtual workplace in large organizations can result in tangible benefits for reducing congestion and pollution from transport, specifically reducing both commuting times and Carbon emissions. The work environment has significantly developed over the past three decades, as a result of the increasing impact of advancing technologies [15], the ongoing evolution of information and communication systems, changing organizational structures, and changing work requirements [16].

For the purpose of this research, virtual work is defined as "an arrangement between employer and employee that allows work to be performed outside of a usual place of work on a regular basis, reducing commuting time, by harnessing ICT which reproduce significant aspects of the centralized work environment" [17]. In academic literature, however, this topic has been examined from a number of different perspectives, and from many different disciplines, often interchanging terms such as work from home, remote work and flexible work, with virtual work. Virtual work is not just a flexible arrangement or working from home, it encompasses anywhere outside of the traditional office that formal work might be conducted.

There are arguably many benefits of virtual work, and they are closely aligned with the environmental, economic and social targets of smart cities [18]. For the employee, this means less time spent commuting, more flexibility and productivity, greater job satisfaction, less stress and need for recovery time [19][20][21]. Employers will benefit from increased productivity, improved staff retention, increased resource efficiency, reduced absenteeism, access to geographically dispersed talent, and fewer disruptions due to traffic congestion and transportation network failures. At a wider societal level, virtual work supports a reduction in traffic congestion and lessens demand for transport infrastructures, resulting in a reduction of harmful environmental impacts from traffic congestion [22].

2.1. Traditional Vs Virtual Workplace

A significant driver of remote work is technology. The rapid development of information and digital technologies is enabling workers to work almost from anywhere in the world and at any time. In our digitally connected world, we can communicate and collaborate instantaneously at the click of a button. Telecommuting is a significant contributor to work productivity and boosts creativity between teams reducing the time wasted traveling between office locations. The fundamental perception of the office location and traditional

working hours is changing as a result of technological advancements. In the past, virtual work was just an ideology, something that seemed almost impossible as internet connection wasn't readily available. It remained a futuristic "yet to be explored" area until around the early 90's- 2000's, and now especially since the inception of smart cities where it became theoretical and conceivable. With the advancement in innovative communications technology, virtual work became an economic necessity within smart cities. Leaders of organization realize that learning and work processes have become intertwined. "It is becoming increasingly difficult to separate learning from production because of the interwoven nature of acquiring knowledge and creating value" [23].

Unlike workers in a traditional office, a virtual employee works across space, time and organizational boundaries with links strengthened by webs of communication technologies provided within smart cities. However, many of the best practices for traditional teams are like those for virtual teams [24]. Virtual workers are significantly different from traditional workers. In the traditional workplace, members work next to one another, confined within the same space, while in virtual offices' they work from separate locations. Virtual teams rely heavily on electronic media for communication and collaboration, as opposed to close contact communication in traditional teams. In traditional teams the coordination of tasks is straightforward and performed by the members of the team together, in contrast, tasks must be much more highly structured in virtual teams.

Nowadays, we live in smart cities which benefit from knowledge sharing with intelligent systems which adapts itself to the users' needs. The goals of smart city development are to improve environmental efficiency, security, and sustainability [6] [7] and generally improve citizens' lives [2], using centrally controlled and monitored technological infrastructures. With the disappearance of the traditional working resumption and closing time, we are witnessing a technological revolution. High-speed internet and the power of mobile technology are rapid advances that have enabled individuals to access information wherever and whenever [25]. These technologies enable the users to communicate across space and time. Digital innovation, which happens at a high speed, has a direct and fundamental impact on business processes and organizational structures, which are inevitably susceptible to change [26]. The introduction and implementation of Advanced Information Technologies (AIT) in organizations [27] has an impact on how people work and interact around the world, from real-life to virtual settings [28]. A virtual context sustains an environment where there are minimal physical interactions between leaders and team members.

When leaders and team members interact and work within the virtual environment using technology, several challenges to traditional leadership practices arise [29] [30] [31]. In recent years, there has been an introduction of highly advanced communication technologies with the consequence of a faster pace of change within organizations [32] [33]. To adapt to the speed of communication and information sharing, organizational systems, structures and processes have been modified in many organizations [32]. The new technology has enabled leaders and team members to work and stay in contact with each other through interactions via emails, instant messages, online platforms, telephone, audio and video conferencing and message boards [34]. Therefore, teams do not need to be

present in the same physical environment but rely solely on the use of communications technology and rarely meet face-to-face, if ever.

The traditional workplace has its members gathered in the same location, at the same time while its more modern counterpart, the virtual workplace has its members dispersed across different locations and time zones. Some authors may refer to it as a distributed team [32] [35] or "virtual teams" [35], "e-teams" [34], "global Virtual teams", "far-flung teams" [32]. The term "virtual" has created some confusion and has been considered to be misleading since it implies an unreality [34].

However, virtual teams are real teams, especially considering that they have all of the characteristics, roles, challenges, tasks, goals and missions as a traditional team may have[32] [33] [34] Malhotra et al., 2007). Although, [31] and [35] point out that virtual workplaces come in many forms and that they may differ in terms of objectives, membership criteria, cultural diversity, organizational affiliations etc. In this thesis, we are using the term "distributed teams" as the overarching term for this type of work unit. A distributed team can be defined as; "team members from different time zones, nations, cultures and companies or departments that work, collaborate and communicate through technologies" [27] [29] [31] [32] [33] [35]. The purpose of a distributed team could be to strengthen customer focus through representation in the local market or to increase productivity, market share, or profitability [33]. Many distributed teams are cross-functional and they are involved with the intention of fulfilling more than just one purpose [33].

2.2. Factors Supporting the Transformation of Traditional into Virtual Workplaces in Smart Cities

Since the 1970s, many researchers have studied diverse aspects of virtual work, resulting in advances in understanding of the key issues but also, at times, divergent, conflicting, and counterintuitive outcomes [26]. Definitional issues (What exactly constitutes virtual work?), methodological issues (How should some constructs be measured?), and implicit assumptions and conceptualizations of anywhere working amongst different researchers may contribute to these inconsistencies. Other issues may be related to the diversity of virtual work research: researchers are drawn from a range of disciplines including psychology, urban planning, transportation studies, management, labour law, information systems, and communication, [22] [26] [37] [38] [39] [40]. However, several key factors have also changed that impact the feasibility of virtual work and its potential results. These factors are environmental, economic, technological and social-organizational factors.

First, environmental awareness has changed markedly since the 1970s. Climate change and global warming, caused largely by greenhouse gas emissions, are regarded as a pressing global issue requiring urgent action on the part of governments and societies Estimates suggest that approximately 70% of greenhouse emissions are energy related and include transportation, heating, and power generation as major contributors [41]. Furthermore, inefficient transportation due to traffic congestion has a high cost, estimated to cost the US economy $78 billion per year in lost productivity [42]. Traffic congestion a primary growing cause of concern in many cities around the world, where motor vehicle use is

rapidly increasing, contributing to a number of serious local, regional, and atmospheric issues. This is especially important in Australia, which was recently named the 'worst performing industrial country on climate change' in the United Nations Environment Programme's Emissions Gap Report [43], which assesses countries' performance in terms of emissions, trends in emissions, energy efficiency, renewable energy policies, and approach to climate change at the national and international levels.

Traffic congestion is a direct cause of increasing greenhouse gas emission, which leads to reduced agricultural productivity, and a major contributor to inefficient supply chains, [44][45]. Congestion can thus be conceptualized as a physical problem of excessive demand for available road space, but it is also a psychosocial one, relating to expectations drivers have of their ability to drive unimpeded along roads [46]. From a business perspective the slow speeds and less predictable journey times caused by traffic congestion lead to time delays, losses in productivity, increased fuel and logistical costs, along with financial penalties [47] [48]. It can have a significant negative impact on commuters' overall work-life balance, causing stress at work and at home, leading to physical and physiological health issues for both themselves and their families, and potentially triggering serious behavioral changes [49] [50]. Commuters are becoming increasingly frustrated by the lack of action from government and public policymakers who are responsible for road infrastructure and public transportation, but the economy and school systems continue to operate in such a way that the majority of people must use the same congested routes at the same time every day [51].

Arguably, virtual working which reduces the need for commuting and dematerialization (the need for physical infrastructure) both have the potential to play an important role in reducing harmful emissions caused by traffic congestion [41] and the need for ever-increasing investment in road transportation networks [36]. However, attitudinal changes may also be needed to effect this change. A recent study revealed that a majority of drivers would rather extend their workday (by leaving home earlier in the morning and/or leaving work later in the evening) than using public transport [52]. But attitudinal change is occurring, with a majority of younger people opting to use public transport to avoid traffic congestion. Arguably, this generation is the most connected and more likely to embrace the sorts of changes implied by anywhere working.

Second, particularly in the developed world as national wealth increases, we have seen a shift from a largely manufacturing-based economy to an information-based service economy operating in and subject to global market forces. As organizations increasingly engage in business where value is essentially derived from the collection, control, exchange, distribution, and transmission of information rather than from physical goods, jobs increasingly change to involve information related activities rather than physical ones [53]. Finance, business, information technology, and media are examples of professional services that characterize the shift to a service economy and challenge existing norms about when and where work can be performed [17]. The use of modern information and ICT eliminates the need for workers to be physically present in an organization to do their jobs effectively, resulting in a "task from place" decoupling of work [19]. Arguably, future work concepts for knowledge workers (professional, managerial, and clerical workers) will be

about working anywhere, based on skill and performance rather than location [17]. This trend is beneficial for concepts such as anywhere working and holds the promise of reducing traffic congestion by allowing former commuters to work from home or nearby facilities.

Third, underpinning the move toward the service economy are technological developments. While working at home was infeasible in Nilles's time due to technological limitations, and even remote work centres somewhat clumsy in their dependence on minicomputers and batch processing overnight, the confluence of several technological advances means that Nilles's vision is a modern-day reality. In many countries, there is widespread access to the Internet using broadband and/or wireless networks, with telecommunications capacity making work feasible from anywhere. This is supported by cloud computing, offering on-demand access to corporate data, applications, and processing, again supporting notions such as anywhere, anytime working. At the same time, there has been a proliferation of powerful, easy-to use, personally owned, smart mobile devices (laptops, tablets, smartphones, and the likes) that all support increased mobility, portability, and anywhere working. Another important development has been in quality teleconferencing technologies that remove the need for commuters to always be contiguous and physically present at the same physical location. From cheap audio- and videoconferencing solutions, such as Skype, to high-end teleconferencing and virtual meeting facilities, ICT is enabling workers to successfully collaborate without the need for them all to be in the same physical location.

A tech-savvy generation of workers is emerging that is accustomed to being connected to the Internet 24/7 and working in non-traditional locations and who seem to value the flexibility that easy access to information and appropriate technologies provides. It is this generation that has expressed a willingness to embrace telecommuting in order to relieve traffic congestion [52]. The World Economic Forum identified changing work environments and flexible working arrangements as the most significant driver of change in advanced economies today, saying that its impact is already being felt and that organizations should soon expect to have "an ever-smaller pool of core full-time employees for fixed functions, backed up by colleagues in other countries and external consultants and contractors for specific projects [54]." Also, [55] suggests that organizations will reduce their physical workspaces by 20% by 2020 [55]. These trends are important to reduce traffic congestion and lower greenhouse gas emission in smart cities.

Fourth, accompanying these three key trends are important social and organizational changes that are argued to support the uptake and importance of anywhere working. White-collar workers now have improved confidence and competence in using a range of modern technologies. Indeed, this could be argued to be dependence in the sense that a whole chunk of work and personal activities are affected through the use of a combination of ICT. They are increasingly familiar and comfortable with communicating, socializing, managing relationships, and collaborating with others online, particularly via a variety of social media, all of which embody fundamentally new ways of communicating. Increasingly, via the adoption of cloud technologies, organizations are able to make corporate data and systems available to their workforce, supporting worker mobility. This confidence and

competence in using technologies to access work-related systems, telecommunications and social media translate into supporting anywhere working through effective use of ICT to enable common work activities. This also supports dematerialization, through a reduction in need to office workers to be physically present in the office during normal working hours, which reduces the need for commuting. The most prominent organizational trend in 2016 is that of organizational redesign, with a focus on moving away from functional structures toward networks of teams, supported by ICT, that enable goal setting, sharing of information, and management of multi-team projects [56]. This is driven by the need for flexibility and agility in competitive markets and the recognition of the need for multidisciplinary workgroup teams to bring together the complementary knowledge necessary to support rapid innovation [57]. The redesign of organizations, coupled with a tech-smart workforce demanding flexibility, combine to drive the attractiveness and uptake of anywhere working.

3. Motivation for Transformation

The motivation for transformation is the business reason for adopting a virtual work arrangement. In studying virtual work, many authors have examined the reasons why organizations are interested in this option for their employees. The primary reasons cited in the literature as motivation for the introduction of virtual work programs are:[58] mentions the reduced expenses of organizations, such as "rent, maintenance, computers, telephones, offices, utilities, equipment, etc". [59] also make further explanations about office space costs and indicate that companies can avoid leasing additional offices through a telecommuting program. [60] also mentions the reduced costs of parking space for the employees' cars. Another factor organizations have as a motivation is increased workforce productivity. Both [58] and [59] mention productivity factor and suggest that the reason behind it, is long periods of uninterrupted time for concentration on their tasks and "lack of interruptions, increased concentration, increased motivation, employee satisfaction, a better employee dedication, increased work energy by reducing time and disruptive elements" [58]. The third factor is related to the possibility to employ people who may otherwise not be able to travel to the office, such as mothers, the handicapped, employees who live far away from the office and do not want to be relocated [59]. The fourth factor is concerned with reducing absenteeism. [58] claims that these factors reduce absenteeism: "diseases, family events, adverse weather conditions, nervous breakdown". [61] adds the factor of caring for sick children or elders easily without having to take time off from work into the list of factors reducing absenteeism. The fifth factor motivating the organizations for transforming into a virtual workplace is "reducing the spreading of contagious diseases among employees, which causes interruptions in the working process and additional expenses" [58]. The sixth factor is related to reducing employee stress of the employees.

It is expected that managers will choose to adopt virtual workplace depending on the business reason for adoption. For example, firms cannot reduce office space costs if workers are in a remote location only part of the time and still retain office space at the central location [62].

3.1. Technological tools for transforming into Virtual Workplace

Several commercial companies have spurred as platforms for global corporations to organize, schedule and conduct online, web, video, and telephone conferences and meetings for a reasonable cost across national boundaries. To mention a few, amongst the commonly known in the United States of America, are WebEx.com, zoom. us, gotomeetings.com, logmein.com, GSuite.google.com, Vidyo.com, and slack.com (see Table 1).

Table 1: Web Based Collaboration Platforms

COMPANY	Description
WebEx.com	26.5 million meetings per month. 93% of Fortune 100 company clients. 78% of Fortune 500 company clients. Specialized products to offer meetings, video conferences, events, webinars, or training.
Zoom.us	750,000 corporate clients. Up to 500 video participants and 10,000 viewers at a time. Enterprise video communication, with a secure, easy platform for video and audio conferencing, messaging, and webinars across mobile, desktop, and room systems used around the world.
Gotomeetings.com	16 million users. 56 million online meetings. Meetings, video and web conferencing, chats, emails, and desktop application and screen sharing using desktop and mobile devices.
Logmein.com	200 million customer engagements. 2 million users per day. Offices located in USA, Australia, Hungary, India, Ireland, and UK. Services include phone and video conferencing, and collaboration apps and software.
GSuite.google.com	Offers meetings, video conferences, training, storage, manages users, devices, and data, calendar, screen share, real-time document edits, file sharing, and archives.
Vidyo.com	Mission is to deliver the world's highest quality, most innovative interactive video communication platform and technologies at Web-Scale. Offices located in US, China, and France.
Slack.com	8 million users per week. 29 client companies on Fortune 100. 100 companies from 100 countries. Offices located in US, UK, Canada, Australia, Japan, and Ireland. A platform that connects teams with the apps, services, and resources around the world.

Source: Compiled by Mehta and Shah from various sources of information, 09/01/2017

Furthermore, apps and software tools for virtual collaborations are on the rise. To mention a few, amongst commonly known in the United States of America are Basecamp, Google Drive, Cloud, Dropbox, Skype, iDoneThis, Skitch, and others (see Table 2). [63] emphasizes the importance of Cloud as a virtual collaboration tool. These digital tools support virtual collaboration through data storage, file sharing, real-time editing documents, pictorial annotations, chats, calendars, discussion webpage, progress tracking, to-do-lists, and other services (worksnug.com).

Table 2:Virtual Collaboration Apps And Software	
Platform Name	Description
Cloud	A platform for data storage, management, analytics, security, and backup, virtual collaborations, manage infrastructure, tools to work anywhere, and protect users, devices, apps and data.
Skype	An app for day-to-day communications.Phone and video call, instant message, and swap files.
Basecamp	A project management app. Hosts focused discussions on a dedicated project webpage, tracks team's progress towards a goal, and manages to-do lists. Also share calendars, files and collaborate on text documents.
Google Drive	Is the new home of Google Docs, which is Google's answer to Microsoft Office.Collaborate on documents in real time, leave comments on team's work, or chat while you work together.
Dropbox	With this software files are automatically updated, backed up, and can be shared with secured pass code.
iDoneThis	A simple web app that's more about celebrating your team's achievements than it is about spying on what's been done. It sends an evening email reminder that everyone on your team writes a quick reply to saying what they did that day – just one line per task. The next day, everyone gets a digest with what everyone else has been working on.
Skitch	A too used to show rather than tell.Take a screen grab of what you can see on your desktop or in your web browser and annotate it with shapes, arrows, quick sketches and text.
Join.me	An app for show-don't-tell scenarios.Share your screen with up to 10 other users, let them control your computer, chat and swap files. Good for showing work in progress or for helping out team members with technical difficulties that are hard to explain over the phone or over e-mail.
Source: Information compiled by Mehta and Shah from various sources including worksnug.com, 09/01/17.	

Technology can help with communication. Team members can talk to one another with virtual messaging services, as well as being able to organize their work in a more central way. Having a central hub for messages and notes means that everyone can keep track of what is happening within the company. The most important thing to focus on with a virtual team is that everyone still works to the most efficient level that they can, so productivity must be kept as high as possible. It can be done by using technological enhancements. Having a central Customer Relationship Management (CRM) tools to create tasks is a very good way of doing this so that everyone can see what they need to do next. With a project management tool, it can be ensured that the whole project is moving forward as planned. Marketing automation can also be used to ensure that the work flows steadily, and no one is stuck on a particular task [64]. However, technology cannot truly replace face to face human interaction. Even with advanced technology, organizations can benefit by investing in travel and face to face meetings when the expense can be met. Even infrequent yearly face to face meetings can do a great deal to solidify trust within a virtual team.

3.2.Guidelines for Formulating a Virtual Workplace Strategy

We adapted the 11 questions developed by [65], these questions are grouped along the four dimensions of the Digital Transformation Framework described in their study; u*se of technologies, changes in value creation, structural changes* and *financial.* For each dimension, we list the strategic questions about virtual workplace adoption that management must address and provide a set of strategic options from which management can choose as they answer the questions. In combination, these questions cover all relevant aspects of a virtual workplace adoption strategy.

3.2.1 Use of technologies Dimension

Virtual workplace is driven by the advent of digital technologies. Thus, a company's approach to using new digital technologies is an essential dimension of a virtual workplace adoption strategy. This dimension requires that managers assess the role of their IT departments and how proactive and innovative they are in their approach to new technologies. They need to answer two strategic questions:

Question 1: How Significant Is Your Firm's IT to Achieving Strategic Goals?
Emerging digital technologies can create new opportunities for firms and may be crucial for securing a competitive advantage. Nevertheless, the significance of IT and its strategic role varies substantially across companies. The cases reveal that some firms regard IT as an enabler of new business opportunities. Others, however, instead use IT to support and fulfill defined business requirements and improvements. Thus, in some firms the initial driver of change is a new digital technology, whereas in others business issues drive the change process, and a suitable technology must be identified to support the change. While [66] has noted that ICTs may go beyond their intended remit of simply overcoming geographical and time zone differences, to providing support for the creation and maintenance of team identity; they may also present a number of new contextual problems not familiar from face-to-face communication. [67] asks whether, in the emerging world of ethical monitoring of electronic systems, this may not lead to a multitude of ethical questions regarding privacy, trust, and employee rights, with virtual team managers needing to understand the ramifications of monitoring programs on the dynamics of virtual project work. There is the additional expense of training on the technologies to be used [68], and the alignment of technology used across multiple time zones, when the logistics of virtual team meetings are likely to become extremely complex [66].

Question 2: How Ambitious Is Your Firm's Approach to Virtual Technologies?
Regardless of the strategic role of Virtual Workplace, companies can take different approaches to the process of diffusing virtual technologies. More conservative firms may adopt established and widely used technology solutions, while others may deploy new technology solutions at the early stages of their development. [65] stated that a firm's virtual technology ambition is largely determined by its unique context. However, when assessing where they should ideally be in the virtual technology ambition spectrum, firms should consider their existing technological competence, the extent of their technology spending and their size.

Some companies have traditionally been followers in terms of their technology ambitions, but new Internet-based technologies have created both opportunities for them and the need for them to act more rapidly to remain ahead of the curve [65]. However, not all companies have the technological competencies required to become leaders in technology development or use—nor do they need to do so. Instead, they should carefully assess their virtual technological ambitions and align them with IT investment decisions.

3.2.2 Changes in Value Creation Dimension

Changes in value creation derive from the way in which virtual technologies alter a firm's workplace model. At many companies, changes in value creation relates mainly to the degree to which a company has already diversified its work paradigm into the virtual world, how it plans to generate revenues from virtual technologies and to its main business focus after a virtual workplace adoption.

Question 3: How "Virtual" Is Your Interface to the Employee?
Instead of simply transforming previously traditional workplace into the virtual world, many firms want or need to exploit the possibilities of digital technologies and explore various working paradigms. Managers have to consider the extent to which their firm should diversify its work operations into the virtual world.

The levels of diversification shown in the figure (1) allow organization to assess various forms of virtual tools. The highest level of diversification that can be achieved will be determined by a company's financial background and size. We adapted the classification proffered by [69] in broad terms as;

- *Home-based virtual work* - where staff who would otherwise be based in an office use computers and other forms of technology to work from home on a regular basis for a significant part of their working time.
- *Nomadic virtual work* - where employees (eg engineers and sales staff) who are not normally based in an office for all of their working day use computers and other telecommunications devices to maintain contact with their base.
- *Ad hoc virtual work* - where office-based staff use computers and telecommunications to allow them to work from home under certain well defined circumstances (including all types of staff who work from home occasionally, as well as "special case" out-of-hours or standby staff equipped with computers and/or mobile phones for remote access from home when on standby).

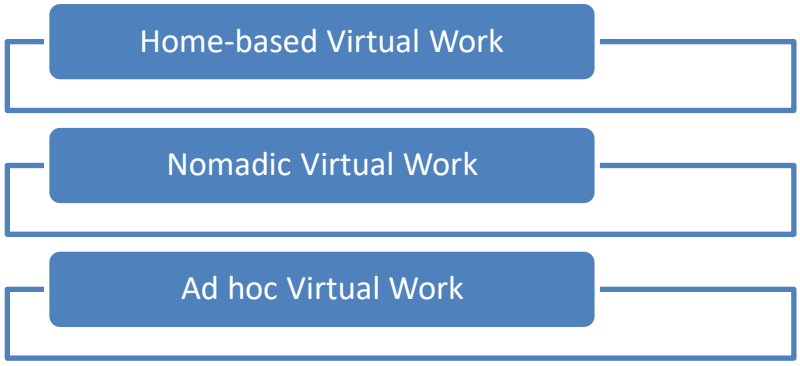

Fig. 1. Forms of Virtual Work

Each of these sets of classifications add to our understanding of the different forms of virtual work, particularly in terms of the experience of virtual workers and the way they are managed, but they are at best partial in so far as they focus only on location - where the telework is carried out - and/or on the nature of the employment relationship.They also lend themselves to a binary notion of virtual work - one either does it or one does not - and tend to ignore the fact that while virtual work can be exclusively of one type, it can also consist of any combination of these styles and traditional office based work [69].

Question 4: How Will You Create/Maintain Revenue from Future Work Operations?

Maintaining or finding new sources of revenue is crucial for future business success and therefore an indispensable element of a virtual workplace adoption strategy [67]. When adopting a virtual workplace, companies must consider how they can create value and therefore generate revenue.

Question 5: What Will Your Future Work Arrangement Be?

In a virtual team, members are dispersed geographically or organizationally. Their primary interaction is through some combination of electronic communication systems. They may never "meet" in the traditional sense. Further, team membership is often fluid, evolving according to changing task requirements [70]. A key advantage of such an arrangement is that team communications and work reports are available online to facilitate swift responses to the demands of a global market. For example, Veriphone, like some other software developers, uses a "relay race" speed up development. Here is how it works. Software engineers at Dallas headquarters work a full day on a project, then, using groupware, they put their work product online on the company's intranet. As the Dallas employees are leaving work, their Veriphone counterparts in Honolulu are arriving. The Honolulu engineers begin working where their Dallas counterparts left off. They then work a full day, and hand off their work product to their Veriphone counterparts in Bombay, who are just coming to work. As the Bombay software engineers are leaving work, they transmit their work product electronically back to headquarters in Dallas, where their counterparts are just arriving for the next day's work. Electronic communications media make the relay

race possible. Clients benefit from the firm's speedy response to their needs. These are just a few illustrations of the impact of technology on virtual work arrangements, and they are by no means exhaustive [71].

3.2.3 Structural Changes Dimension

Virtual transformation, as any other type of transformation, impacts a company's organizational structures. The structural dimension of the Digital Transformation Framework developed by [65]. is concerned with who will be in charge of the transformation endeavor. Additionally, management has to decide whether new virtually enabled operations should be integrated into existing structures or be located in independent entities that are separated from the company's core business. The company may also have to acquire specialized know-how or new competencies. Finally, managers must consider what types of operational changes to expect as they explore and exploit digital technologies [67].

Question 6: Who Is in Charge of Your Virtual Transformation Endeavor?

In many organizations, the success of a virtual workplace adoption strategy depends on two factors: top management support and the commitment of the necessary people to the strategy. According to the study of [65], the CEO is fully responsible for and adds authority to the digital transformation strategy. The execution of such a strategy is often delegated to a senior manager who could either be the manager of the business unit that is responsible for large portions of the employee management or of the business unit that is most affected by the virtual workplace adoption. The CIO may also manage the adoption, which is typically the case if the focus is on business processes. The CIO typically focuses on the IT infrastructure and the internal work processes, whereas the CDO primarily addresses digital technologies that involve digital products and services at the customer interface. Needless to say, the CIO and CDO should actively communicate with one another and closely coordinate their strategies and initiatives.

Question 7: Do You Plan to Integrate New Operations into Existing Structures or Create Separate Entities?

Because virtual workplace adoption can redefine a firm's business model, one key concern for companies is where to position the virtual workplace activities in the organization structure. They must decide whether to integrate new operations into their current operations or to organize them as distinct, separate units (perhaps as a newly formed subsidiary). Each of which has advantages and disadvantages. Integration into the existing corporate structure typically requires less extensive restructuring efforts. The integration approach may be preferred if close coordination between traditional and virtual workplace operations will be necessary. In this situation, it is important to examine whether synergies between traditional areas and virtual workplace activities can be exploited [65].

In contrast, organizing new digital activities in separate structures makes it easier for firms to explicitly separate (physically and ideologically) their old and new operations. They can also develop from scratch appropriate structures for virtual activities, which typically are more innovative and provide an increased level of flexibility. Thus far, it has not been clear whether separation or integration is the preferred approach. However, theory and practice

suggest that the greater the distance between virtual efforts and a firm's current core activities, the stronger the boundary between new and old operations should be [67]. Thus, for gradual, core-business related transformations, integration into existing structures should be preferred, but only if the change processes are strongly supported by top management. But virtual workplace initiatives often involve significant innovation and change efforts, as well as a willingness to take risks, all of which may be difficult to accommodate within existing organizational structures.

Question 8: What Types of Operational Changes Do You Expect?
Depending on the scope of the organization's business and the specific future virtual workplace plans, a virtual workplace adoption strategy can require different types of operational changes. First, new technologies can significantly change the current work paradigm of the employees. Second, digital technologies can enable changes to business processes. Business processes can be classified as operational, support and management, but the typical focus of virtual workplace adoption initiatives is on operational processes. For instance, digital technologies can accelerate the execution of business processes, involve different staff, require different resources or fully automate certain steps. Reengineering business processes can be complex because they often span divisions or even companies[65][67]. A company must therefore fully define their processes, and assess which of them will be affected by virtual workplace adoption initiatives and what the potential impacts will be.

Question 9: Do You Need to Acquire New Competencies? If so, How Do You Plan to Acquire Them?
The necessary changes in work paradigm and business processes in a digitally transformed business, and the maintenance of ongoing operations, will likely require new skills. Managers must carefully assess the firm's existing technology capabilities and identify the new competencies that will be needed of. [65] stated that competencies can be acquired in different ways. The best option will largely be determined by the existing capabilities and financial resources of the firm, and the scheduled timescale for the virtual workplace initiatives. The first option is for firms to build on their current capabilities and acquire the required competencies themselves (e.g., by either training current staff or hiring new employees) [67]. However, this approach typically takes time. Another option, therefore, is to partner with other companies that may have already established specific knowledge to facilitate integration processes. This approach reduces the risk of failure. If the jointly shared activities are of high strategic importance, acquiring the partner company may be an option for ensuring that the common resources and knowledge will be retained in-house.

3.2.4 Financial Aspects Dimension

The financial dimension is also a significant aspect of digital transformation endeavors. Increasing financial pressure on the current core business might be the trigger that convinces management of the need for action. And financial resources will be necessary to carry out transformational initiatives.

Question 10. How Strong Is the Financial Pressure on Your Current Core Business?
The willingness of top management to undertake the necessary efforts for, and accept the ensuing risks of, virtual workplace endeavors often depends on the competitiveness of the current core business. If a firm's current core business continues to create sufficient profits, managers may not see the urgency for embarking on workplace transformation efforts or be willing to take the risks except for disease or crisis prevention control. History, however, has shown that employee satisfaction is vital for employee retention and productivity and that acting too late can be fatal for companies [72]. We urge all companies to take workplace transformation seriously and address its potential effects and take necessary measures when adopting.

Question 11. How Will You Finance the Virtual Workplace Adoption Endeavor?
Virtual workplace adoption strategies seek to maximize value creation. To finance their virtual workplace endeavors, firms can choose either internal or external financing options. Successfully financing a transformation endeavor depends on a firm's current well-being and its future prospects. Investors of any kind must have faith that the workplace transformation is beneficial to the firm and that their investments will therefore pay off [72]. Thus, if a company is already financially struggling, its options for financing virtual workplace adoption will be severely limited.

4.Discussion and Implication

Virtual workplace is a highly complex, company-wide endeavor. A systematic approach to formulating a virtual workplace adoption strategy is crucial for success. Moreover, a firm's first steps toward virtual workplace models are characterized by a high level of uncertainty. To help managers to address the challenge more systematically, we have extended previous work on virtual workplace adoption strategy through the lessons learned from the theoretical review of this study.

From the study of [65], our research has identified and adapted a set of strategic questions that managers responsible for virtual workplace have to consider. Unfortunately, there are no universal, definitive answers to these questions. We believe that the most important thing for managers charged with formulating their firms' virtual workplace adoption strategies is to know the right questions to ask. By drawing on the successful approaches adopted by firms, answering these questions within their own business contexts will provide managers with a comprehensive and structured approach to virtual workplace that will enable them to cut through the complexity of virtual workplace adoption strategies.

5.Conclusion

Organizations may ensure that workers have the right technology (organizational or personally owned) before adopting virtual workplace. Those who aim to increase their internal flexibility or worker mobility may look to virtual workplace as an interesting solution. Likewise, virtual workplace is a proper strategy for organizations aiming to reduce costs, as it will allow them to hire in cheaper geographies while employees save travel expenses. Finally, virtual workplace is also seen as a great way for workers to better

organize their day to accomplish both work and personal affairs, which may increase worker motivation and productivity.
Nonetheless, virtual workplace also presents some management concerns. Organizations may struggle to control technology issues as often times part of what is used is not under their control (workers' home infrastructure). This may lead to communicational issues, which may occur as a result of poor communication quality or an absence of visual contact that would allow the reading of body language. Managers also struggle to identify and tackle various types of problems as virtual workplace is not suitable for every worker; it is up to management to define and oversee the virtual workplace capabilities and performance of each worker before adopting.

The purpose of this article was to highlight some implementation guidelines for adopting the virtual work arrangements. Emails, telephone calls, video conferences, chat rooms, instant messaging, and collaborative software are just some of the strategies in the tool kit of the virtual manager. Experiment to determine which ones work best in given situations. Learn to appreciate the power, the gains in efficiency, and the challenges that each tool presents. Use the technology that is currently available. Also the responses to the 11 questions should be used as guidelines when formulating a virtual workplace strategy of an organization. Virtual work arrangements will become more, not less, popular in the future. Today's technology can generate stunning gains in efficiency and productivity. The potential for future improvements is even greater.

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