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HOW CLOUD SERVICE TECHNOLOGIES HELP ENTREPRENEURSHIP GROW

Master's Thesis

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Abstract

Entrepreneurs and start-ups have to use their resources efficiently in their development processes to reach optimal progress to grow their products or services. This paper introduces the impact of cloud service technologies on the growth of entrepreneurs and start-ups from technical and managerial perspectives. For this purpose, an online survey with 124 participants and three interviews with three start-ups from Estonia were conducted.

The online survey and interviews show that cloud services influence how people collaborate, communicate and store data positively. The positive aspects of cloud services are more dominant over the concerns of using cloud services. The results show that using cloud services for different objectives has become an essential part of everyday life for individuals and start-ups/entrepreneurs, especially during the Covid-19 pandemic.

Keywords: cloud services, cloud computing, cloud technology, entrepreneurship, start-up, Covid-19, pandemic, communication, storage

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Introduction

The development and spread of technology have never been as rapid as it is today in any period, especially after the use of personal computers has increased. Many factors feed this acceleration, and the contribution of cloud services is one of the factors that is undeniably valuable. In a broad definition, cloud service is the delivery of various services over the internet on demand of the personal or corporate customers. According to Gibson, cloud services are critical for cost reduction, a collaboration between disparate organizations, efficient usage of computing resources, etc. (Gibson et al., 2012). Start-ups are increasingly implementing cloud services to their companies. As a result, these technologies can take an innovative approach while entering or developing new or existing markets (Ferri et al., 2020). Both start-ups and corporate companies have started to use cloud technologies to reduce their costs, make their products more accessible worldwide, ease their technology management, and minimize security problems.

Moreover, under COVID-19, pandemic cloud services contribute to reducing physical contact, and the spread of the virus as companies have been continuing or adapting to hold meetings online through online programs of which the infrastructure is provided by cloud providers.

This research aimed to explain and analyze the impact of cloud services on start-ups and entrepreneurs not only with the technological aspect but also the managerial aspect through interviews conducted with Estonian start-ups and an online survey. Because the usage of cloud services is critical for start-ups and entrepreneurs nowadays to reach global markets, reduce costs and have elasticity on the systems. In general, start-ups and

entrepreneurs have limited resources, so they must use their resources more efficiently than big enterprises.

Despite the importance of cloud services, there are not enough descriptive sources about their impact on entrepreneurs. The main lack of content about cloud services is to explain its structure and effect on start-ups to boost their capabilities. Another perspective lacking content is conceptual and practical points of cloud services and entrepreneurship such as digitalization opportunities, contribution to remote working, or even changing traditional communication methods. The current thesis seeks to cover this gap and answer the following research questions:

- I. Why are cloud services critical for entrepreneurs?
- II. Which are the benefits of cloud services for entrepreneurs?
- III. Which are the challenges of cloud services for entrepreneurs?
- IV. What are the effects of the Covid-19 pandemic on cloud services?

To be able to answer and explain the research questions, some tasks are identified. Task 1 is to describe the main characteristics and processes of cloud services. Task 2 is to determine the relations between cloud services and entrepreneurs. Task 3 is to make a quantitative analysis to find answers to research questions depending on the numerical outputs. Task 4 is to have interviews to understand the business approaches towards the usage of cloud services.

Cloud services can have a tremendous impact on existing companies, and start-up companies can primarily benefit from the variety of innovations that cloud services naturally bring with them. As a matter of fact, these benefits and impacts of cloud services are necessary for a company to adapt to today's unpredictable and rapidly evolving digital world.

However, these impacts and benefits are imperative to adopt today's unpredictable and rapidly evolving digital world (Khalil, 2019).

Start-ups are increasingly implementing cloud services to their companies. As a result, these technologies can take an innovative approach while entering or developing in new or existing markets (Ferri et al., 2020). Both startups and corporate companies have started to use cloud technologies to reduce their costs, make their products more accessible worldwide, ease their technology management, and minimize security problems.

The thesis was structured based on a literature review, a quantitative and qualitative analysis. In the literature review, the main aspects of cloud services, cloud-based communications services, impacts of cloud services for remote working, especially during the Covid-19 pandemic, and the benefits and concerns of cloud services for entrepreneurs were focused on. An online survey for quantitative analysis and three interviews for qualitative analysis were conducted during the analysis. In the conclusion part, the outputs from the literature review and analysis were combined to answer research questions.

1. Literature Review

1.1. Definition

1.1.1. Entrepreneurship and Start-ups

The definition of start-ups varies depending on their focuses. According to Garvin, start-ups are “new firms created by individuals breaking off from existing ones to establish competing companies of their own”(Garvin, 1983). Start-ups that are based on the commercialization of scientific facts are called new-technology-based firms (NTBFs) (Skala, 2019). Start-ups can be defined with three characteristics. They are younger than ten years,

work on highly innovative technologies and business models, show growth in employee or business growth (Kollmann et al., 2016). As Graham (2012) said, "A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of "exit." The only essential thing is growth. Everything else we associate with startups follows from growth."

Entrepreneurship entered the business vocabulary as a term in the 1980s, which is the same as "professionalism," the managerial buzzword of the 1970s (Stevenson, 2006). An entrepreneur is a person who starts to produce a new product, uses the latest technology, or trying to enter a new market is likely to be more dependent on support from actors around him/her. Therefore, a fundamental need may be to explore the acceptance, legitimacy, and acquisition of entrepreneurial resources through social behaviors such as social networks (Foss, 1994). Bailetti (2012) said, "Technology entrepreneurship is an investment in a project that assembles and deploys specialized individuals and heterogeneous assets that are intricately related to advances in scientific and technological knowledge for the purpose of creating and capturing value for a firm."

1.1.2. Cloud Services

“Cloud Services” is not a new terminology for the IT industry. However, it has been getting popular among different industries recently to cater to different needs and fill in various gaps in these industries. This is the core reason why many different definitions of “Cloud Services” exist. However, Cloud Services have a widely accepted definition. According to The National Institute of Standards and Technology (NIST), “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of

configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.” (Mell & Grance, 2011). And also NIST mentions that the cloud model has five essential characteristics, three service models, and four deployment models. The essential characteristics are On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, and Measured service. The service models are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). The deployment models are Private cloud, Community cloud, Public cloud, and Hybrid cloud. The definitions of NIST are widely recognized by the industry.

1.2. Essential Characteristics of Cloud Services

1.2.1. On-demand self-service

Consumers are able to reach and use the computing capabilities of cloud services without any human interaction and automatically. If customers do not need a cloud service for a specific period, they can decrease their demands to save money. The amount of time they are willing to wait for their computer job creates a window of continuity in their schedule (Keller et al., 2020).

1.2.2. Broad network access

Computing resources can be reachable over the internet without strict device restrictions so that consumers can control the resources from various devices such as tablets, mobile phones, laptops, or workstations. Tinankoria Diaby and Babak Bashari Rad state that “This is explained using computing capabilities that are available via the internet or network and can be accessed through a channeled and standard mechanism, which is put in place to promote the use of heterogeneous platforms, which can be either very thin or very thick.

Examples of the platforms might include smartphones, tablets, laptops, and workstation computers.” (Diaby & Bashari Rad, 2017).

1.2.3. Resource pooling

As a result of cloud technologies, multiple consumers are served simultaneously using different physical or dynamic resources, depending on the users' demand. For this reason, cloud consumers generally cannot know the exact location of the resource they use for computational resources such as memory, storage, processing. In some cases, they may have control over the location of the country, data center, or state. A good cloud server should have enough capacity for its clients as resource pools all the time and allocates or deallocates these resources effectively and dynamically (Rashid & Chaturvedi, 2017).

1.2.4. Rapid elasticity

The capabilities of cloud systems can be increased or decreased depending on the needs in a fast, elastic and scalable manner. Depending on the demands, these processes can be performed automatically in some cases. Consumers can use the resources of the cloud system almost unlimitedly regardless of time. (Balachandran & Prasad, 2017).

1.2.5. Measured service

Cloud services automatically control and organize the requested resources over the service used (storage, active users, processing) and the metrics (pay-per-use or charge-per-use) connected to these services. The services provided can be observed, measured, and reported transparently by both the service provider and the consumer (Mell & Grance, 2011)

1.3. Deployment Models of Cloud Services

1.3.1. Private cloud

Private cloud refers to cloud computing resources that can only be used by a single unit or organization. A private cloud can be used on-premises by users or provided by a third-party service. The hardware and software used by private cloud users belong only to them. In addition, the services and infrastructure services used are always located in a private network. The main advantage of a private cloud is that managing security issues, maintenance, and keeping the system updated is more straightforward than other deployment models (Jadeja & Modi, 2012).

1.3.2. Community cloud

It is a cloud technology that hosts services that are shared with different organizations or departments within the company that share the exact requests or concerns. Only certain user groups can access the applications and data used. The combination of distributed resource provision, control, sustainability, and practices of cloud computing makes community cloud more valuable with management features (Goyal, 2014). It is generally preferred by organizations that require a constrained environment due to security or legal requirements.

1.3.3. Public cloud

It is the most widely used cloud infrastructure service. The meaning of public cloud is that a company or an organization that tries to sell cloud-based products to public or industry-specific markets owns the whole cloud infrastructure (Peng et al., 2009). Public cloud users share the same hardware, storage, and network devices with other users.

1.3.4. Hybrid cloud

Hybrid cloud refers to models that combine different cloud infrastructures (private, community, or public) or on-premises infrastructure with public cloud systems. While companies generally store their critical data via the Private Cloud due to security and legal restrictions. They prefer to keep all other private and non-sensitive data via the Public Cloud. At this point, Hybrid Cloud enables all data stored in different infrastructures to be managed, aggregated, and accessed more easily. Hybrid Cloud allows companies to benefit from It provides for the organization to serve its needs in the private cloud. If some occasional need occurs, it asks the public cloud for intensive computing resources (Mell & Grance, 2011).

1.4. Service Models

1.4.1. Software as a Service (SaaS)

SaaS products enable users to access and use cloud-based products and services over the internet. SaaS products generally do not require users to purchase any software and provide all its resources to run. Instead, users regularly subscribe to the software manufacturer's service and allow applications to be used over a website or a program interface. SaaS products are more competent for both customers and vendors. Many customers are able to use the same resources, thus resulting in higher hardware and network usage rates (Cusumano, 2010).

1.4.2. Platform as a Service (PaaS)

PaaS, also known as cloudware, is a development framework that includes a range of resources to help with application design, development, testing, implementation, tracking, and cloud storage (Tsai et al., 2010). In on-premise models, the developer has to configure

the platform that will be used, update it and keep it running continuously. PaaS provides you with the services, programming languages, libraries, and tools required for application development as a cloud-based platform. With PaaS, users manage the applications and services they develop themselves; the cloud service provider provides everything else. Users cannot manage cloud infrastructures such as operating systems, storage, or networking, but they can control applications' deployment or hosting settings.

1.4.3. Infrastructure as a Service (IaaS)

In IaaS, users purchase services such as processing, network, or storage from the virtualized infrastructure of the cloud service providers instead of physically purchasing components such as servers, software, and storage. The following are a few examples of IaaS applications. (1) Provides clients with on-demand access to shared services without disclosing data such as location and hardware, (2) provides details such as on-demand server images, storage, queuing, and knowledge about other resources, among other things, and (3) provides complete ownership of server infrastructure, including but not limited to programs, instances, and containers (Manvi & Krishna Shyam, 2014).

1.5. Cloud-based communication services

During the Covid-19 pandemic, the importance of cloud services was proven for entrepreneurs, corporates, educational institutions, or individuals. Cloud-based communication services such as Zoom, Google Meet, Skype, etc., help continue business and studies.

This situation triggered the usage of online communication tools. The best example of the increase in online communication tools is Zoom. The number of Zoom users has increased from 10 million to 200 million in three months (“A Message to Our Users,” 2020).

Google’s video conference tool “Google Meet” had the same situation. According to Google, the daily usage of Google Meet increased by 30x (Soltero, 2020). The daily meeting duration on Microsoft Teams reached 4.1 billion minutes from 900 million minutes (Langston, 2020).

According to App Annie, the number of downloads on application markets of video conferencing tools bounced during the Covid-19 pandemic. ZOOM Cloud Meetings was downloaded 14 times more in the US, 20 times more in the UK, 22 times more in France, 17 times more in Germany, 27 times more in Spain, and 51 times more in Italy. Like ZOOM, Google’s Hangouts Meet had a sharp download growth with 30 times more in the US, 24 times more in the UK (Sydow, 2020)

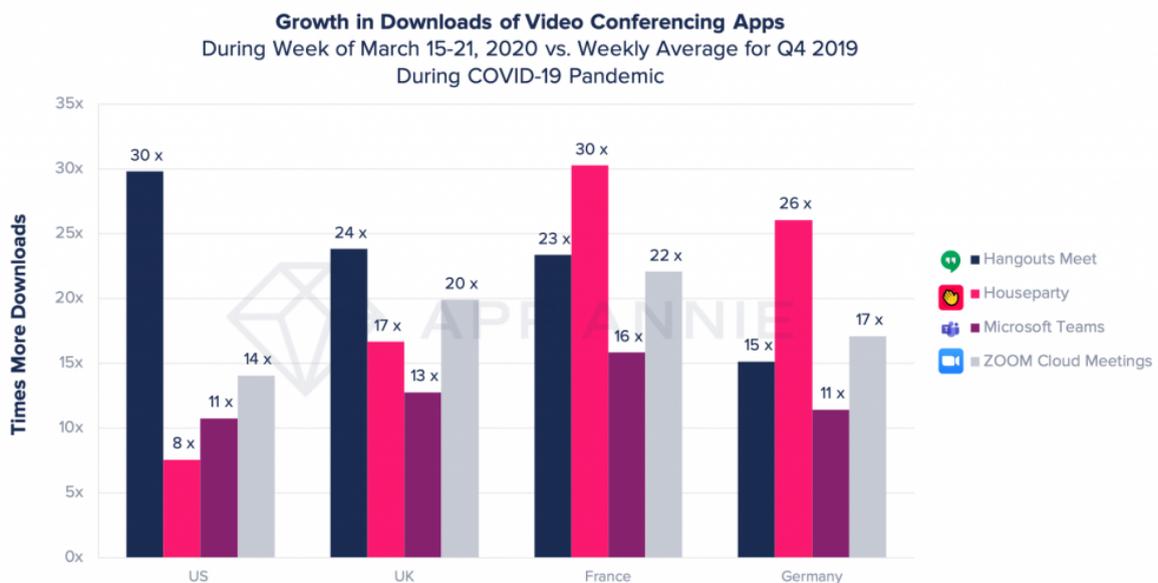


Figure 1. Video Conferencing Apps Surge from Coronavirus Impact (Sydow, 2020)

Despite business-focused cloud-based video conferencing tools, people have started to use video conferencing tools to socialize with their friends, families, etc. Houseparty, which is one of the most popular video conferencing tools amongst generation Z, has gained

momentum in Europe (Sydow, 2020). The download numbers of Houseparty grew by 735 times during the Covid-19 pandemic (Anker, 2021).

1.6. Cloud services for remote working

Companies, especially small enterprises, have had to adapt to the digital environment and provide service to global client needs globally to remain in a competitive climate, particularly in the post-COVID-19 world (Zhang et al., 2021). Many companies have adopted remote working during the pandemic. According to the survey made by NBER (National Bureau of Economic Research), about 35% of the working respondents have changed their working style from commuting to remote during the Covid-19 pandemic (Brynjolfsson et al., 2020).

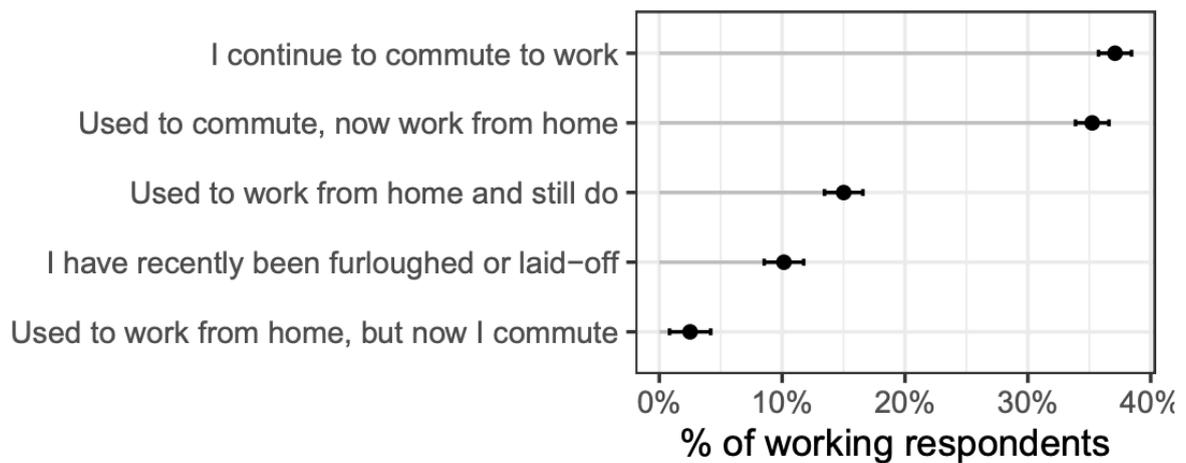


Figure 2. Covid-19 and remote work: an early look at us data (Brynjolfsson et al., 2020)

This change seems to continue in the future. According to Accenture, 46% of people who have never worked from home plan to increase the amount of time that they work from home in the future (Accenture, 2020). This tendency affected cloud service investments. The

spending on cloud services rose by 28% and reached \$65 billion during Covid-19. The most significant growth occurred in PaaS solutions (Platform as a Service) with a 37% rate (Synergy Research Group, 2020).

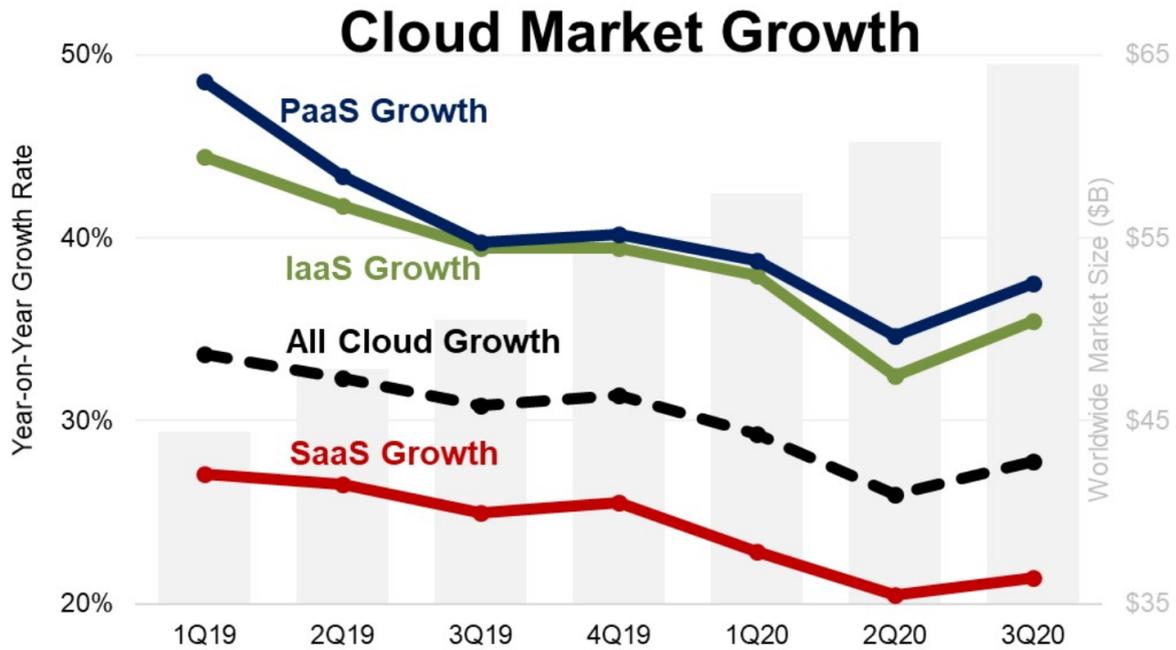


Figure 3. COVID-19 Boosts Cloud Service Spending by \$1.5 Billion in the Third Quarter (Synergy Research Group, 2020)

The growth in cloud services seems to continue in the coming years. A prediction made by IDC shows that integrating edge data with the app hosted in the cloud will be preferred by 25% of the organization by 2024 (IDC, 2020).

1.7. Importance of Cloud Services for entrepreneurs

Cloud services as outcomes from the IT industry opened a new era for the growth of entrepreneurship. They became significantly important for entrepreneurship and SMEs to increase their capabilities and overcome industry difficulties.

1.7.1. Benefits of cloud services for entrepreneurs

According to Peter K. Ross and Michael Blumenstein (Ross & Blumenstein, 2014), the major benefits of cloud services for start-ups and SMEs are increasing global collaboration, reducing opportunity costs, scalability, accessibility to global markets, and international venture capital. In their article, the benefits of cloud services are categorized clearly, and the effects are pointed specifically for entrepreneurs. That is why the following explanations for each benefit were based on Peter K. Ross and Michael Blumenstein's classification.

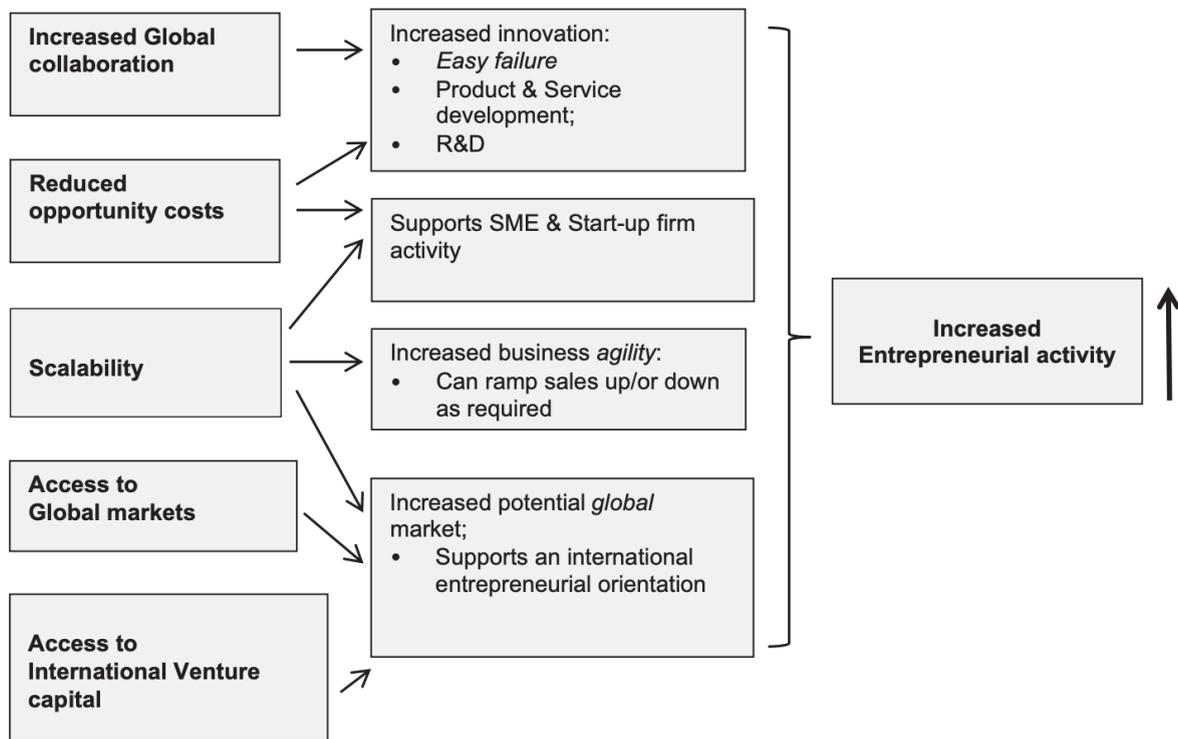


Figure 4. Cloud computing and entrepreneurship (Ross & Blumenstein, 2014)

There are not only physical borders between countries but also digital borders for the companies, such as regulations, capabilities, or communication. These borders have some

complicated effects on mostly start-ups. Cloud services are significant because they help companies remove these borders and start collaborating with other companies or contributing to global networks. Cloud services make information-sharing easier globally. Because of that, the collaboration between individuals and communities is facilitated (McAfee, 2011).

In-house IT investments are one of the most significant cost resources for companies. Having servers, hardware, or other IT necessities and maintaining them requires a higher amount of investment. Many start-ups cannot cope with these expenses quickly. Reducing opportunity costs is more important for start-ups or entrepreneurs because it lowers Research & Development costs and initial ICT investments (Parker, 2005).

Cloud computing, among other solutions, provides customers with cost-effectiveness, which refers to the budgets, resources, and manpower required for cloud deployment, operation, administration, and maintenance since users only pay for what they use (Porrawatpreyakorn et al., 2019).

According to Ross (2011), thanks to the scalable structure of cloud services, companies are able to increase their ICT capabilities to cope with busy business periods or high-demanded market conditions. On the other hand, companies have the opportunity to decrease their IT requirements during static markets or economic downturns.

The scalability and flexibility of IT systems, as well as processing requirements and enterprise processing capabilities, have an important role in the adoption of cloud services by businesses. (Thi Nguyen et al., 2021)

To get investment and grow, accessing global markets and capital is crucial for start-ups. With the help of cloud services, they can reach international markets. Cloud-based

crowdfunding platforms support entrepreneurs by building bridges between them and potential partners or venture capitals. Entrepreneurs are able to pitch their ideas or projects on these platforms to reach the audience who may invest in them. In addition, entrepreneurs can access new venture capitals in different regions with these crowdsourcing platforms (Ross & Blumenstein, 2014).

Due to global marketplaces, marketers and customers may be needed to access essential services or connect with partners at any time or from any location. So, nowadays, the on-demand self-service component of cloud services could be a motivation for SMEs to adopt it. (Fazli et al., 2015)

1.7.2. Challenges of cloud services for entrepreneurs

Although cloud services have many advantages for entrepreneurs, some facts throw entrepreneurs into question. In most ways, entrepreneurs are more open to adopting new technologies or changing routines (Gagnon & Toulouse, 1993). However, adopting new technologies always comes with many concerns due to lack of information or potential problems.

One of the biggest concerns is the cost of adoption and maintenance of cloud services for entrepreneurs. New businesses or entrepreneurs have a limited budget to invest in their services or products. According to DigitalOcean's Currents Report, 71% of respondents point to the cost of maintenance as a top concern for adopting cloud services (Currents Research, 2020).

Adopting cloud services requires a significant change in technological infrastructure and managerial perspective. Because entrepreneurs should develop new skills, change their support mechanisms, budget operations, and so on. It is crucial to have a long-term plan

while adopting cloud services/solutions. Organizations have limited coordinated strategies to adopt and implement new information technologies for long-term usage (Butler & Murphy, 2007).

Security concerns are essential for entrepreneurs and start-ups to adopt cloud solutions. The top security concern is mainly related to data. Start-ups generally have limited resources. To reduce the cost of developing a secure development environment, they might decide to use cloud services to address cybersecurity concerns (Kaufman, 2009). Even if there is strict access control, it is likely that confidential data will be reached illegally. Unauthorized access is possible if insufficient security mechanisms. If the data is stored in the cloud for a long time, the risk of illegal access is getting higher (Wang, 2011). Security risks in cloud services might be different from other conventional IT infrastructure. Because of the pooling of resources, the same pool is allowed to be used by multiple users with multi-tenancy and virtualization technologies. Even though these technologies enable rapid elasticity and optimal management of resources, they also pose certain risks to the system. Multi-tenancy carries the risk that data is visible to other users and operations can be traced (Ali et al., 2015). Relocation of data stored to the external providers causes some security issues because these providers may access your data without permission. As the most commonly used cloud infrastructure service, the public cloud has a shared multi-tenant enabled environment. Because of the high user numbers, security risks are increased and diversified rather than hybrid or private clouds (Tianfield, 2012). However, hybrid cloud has the most promising security-versus-cost ratio between private and public cloud services. Because entrepreneurs can store and manage their data securely, they cut costs by outsourcing the data, which does not require top security (Géczy et al., 2011).

Concerns about data security are another challenge for entrepreneurs. Cyberattacks and intellectual property theft are two specific dangers that businesses utilizing cloud services (Elebute, 2018). The major issue is that unauthorized people can access corporate data, whether foreigners with access to the same server using separate virtual machines, criminals attempting to steal data, or service provider employees. (Siepermann et al., 2016). If the cloud service provider does not remove data after the contract expires, the same result will occur. Another data risk occurs when data consistency and integrity are compromised as a result of connection and transmission failures (Svantesson & Clarke, 2010),(Youseff et al., 2008).

2. Analysis

2.1. Methodology

To be able to understand users' choices and opinions about cloud services sincerely, an online survey as quantitative analysis and three different interviews as qualitative analysis were conducted.

The online survey was conducted between 14.07.21 and 21.07.21 to understand the causes, concerns, and benefits of cloud services and their usage. During the only survey, answers were collected through the survey created on Google Forms. In total, 50 questions under five sections were asked to the participants. To be able to reach the targetted respondent profile, the survey was shared directly with the start-ups in Estonia, Turkey, and the Netherlands, and in the related Facebook ex-pats groups in Estonia.

Three semi-structured interviews were conducted to understand the importance of cloud services for entrepreneurs and start-ups in Estonia and collect qualitative data about their usage. The interviewees were selected from Estonian start-ups by using the Estonian start-up database to be able to understand the usage of cloud services by entrepreneurs and

start-ups in Estonia in detail. All three interviewees are working in Estonian start-ups. The first interviewee is working for a fintech start-up as the Head of Marketing and Communication. The other interviewee works as CPO (Chief Product Officer) in an IoT (Internet of Things) start-up. The last interviewee is working for a telecommunication start-up as a Scrum Master. All interviewees were contacted through their company e-mails, and interviews were conducted via Zoom.

2.2. Quantitative Analysis

With the online survey, the targetted respondent profile was reached. It is understood that the respondents have enough knowledge about what cloud services are and how they should use. According to the respondents, cloud services are significantly essential for both their personal and business lives. Almost all of them use cloud services actively, even if they think there are some concerns about cloud service usage.

2.2.1. Participation

In total, 124 participants took the survey. The country of origin of the participants can be seen in Figure 1. The majority of the participants were from Estonia (52.5%) and Turkey (24%). In addition, there were participants from the Netherlands (3.2%), Spain (2.4%), Finland (1.6%), China (1.6%), the United Kingdom (1.6%), and Greece (0.8%).

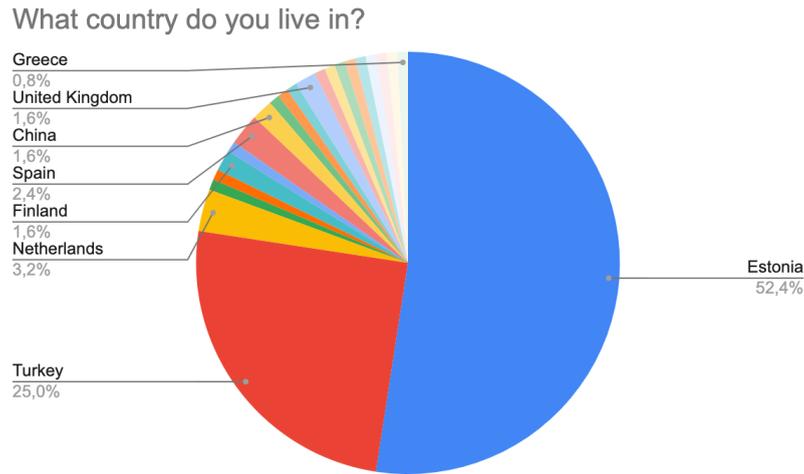


Figure 5. The country of origin of the participants

Most of the participants are working in the Information Technology industry (35.5%) following with Management (11.3%), Design (10.5%), Operation (9.7%), Sales (7.3%), Marketing (5.6%), Finance (3.2%), Research (2.4%), Engineering (1.6%) and Communications (0.8%).

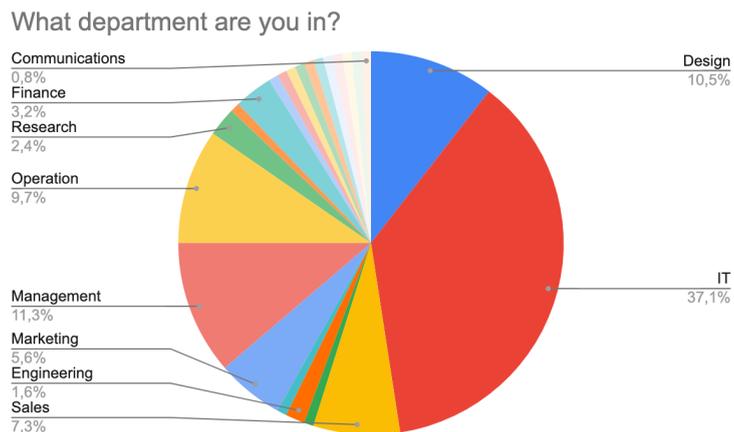


Figure 6. The industry of the participants are working in

As a result of the high participation from the Information Technology Industry (37.1%), the majority of the respondents are working as Software Developer (22.6%).

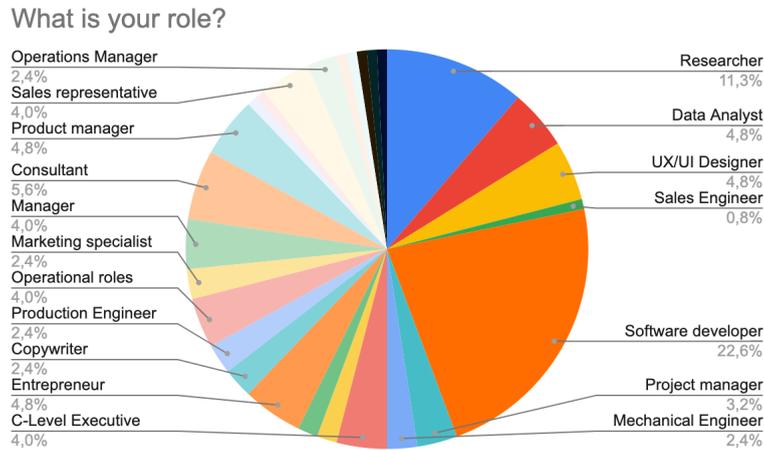


Figure 7. The role of the participants

The second biggest group of respondents are working as Researcher. The other professions of respondents are Consultant (5.6%), Product Manager (4.8%), Entrepreneur (4.8%), Data Analyst (4.8%), UX/UI Designer (4.8%), and others.

2.2.2. Cloud Service Usage for Business

According to 76.6% of the participants, their companies have already adopted some cloud services and started using them. The most common service type is SaaS (Software as a Service) with 45.4%, followed by PaaS (Platform as a Service) with 37.8%.

Is your company using cloud services?
124 responses

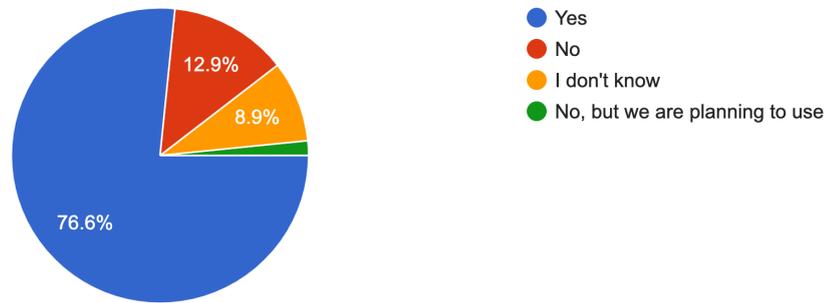


Figure 8. Usage for Business

77.4 % of the participants stated that they are using cloud storage for business. The most common product is Google Drive (70.3%) following by OneDrive (42.6%), Dropbox (13.9%), iCloud (7.9%), and others.

If yes, please specify the product(s) you use
101 responses

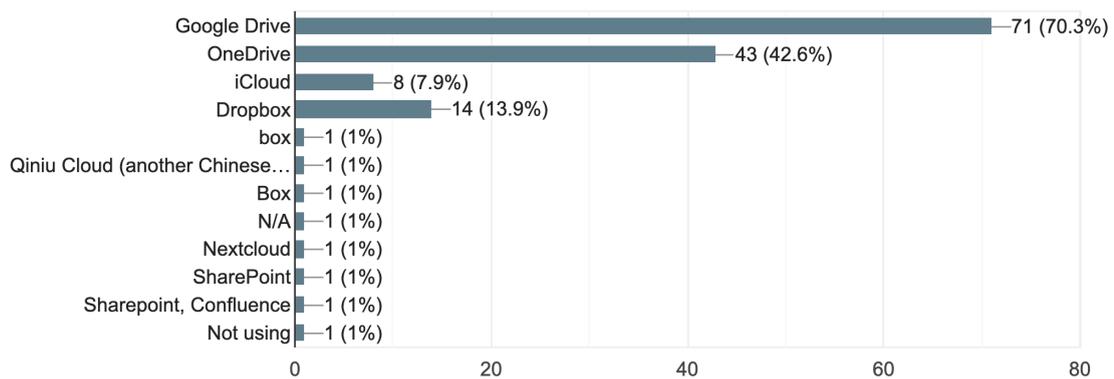


Figure 9. Products for Cloud Storage for Business

In addition, more than ¾ of the participants think that cloud storage is very critical for businesses. This may be because physical devices might get lost, and therefore the data they carry might go away along with those physical storage devices such as hard discs, USB sticks, etc. It may be that fear of losing physical storage causes cloud storages to substitute traditional storage mechanisms. Besides, in contrast to physical storage units that need to be attached to a device to show the data inside, cloud storages are easier to access from desktop to mobile, from tablet to even gaming consoles, as they are only a few clicks or taps away. Another advantage of using cloud storage might be that they allow users to share data (photos, videos, documents, etc.) in multiple ways, such as by giving direct links, allowing the user to group the data in a folder, generating a link, and let the other users access to the folder, simply allowing to send the data directly to another cloud service platform, or even allowing multiple users to work on the same data simultaneously.

According to 96% of the participants, they use cloud communication services for business. The most common product is Microsoft Teams (62%), followed by Zoom (60.3%), Google Meet (43%), Skype (37.2%), and others.

If yes, please specify the product(s) you use
121 responses

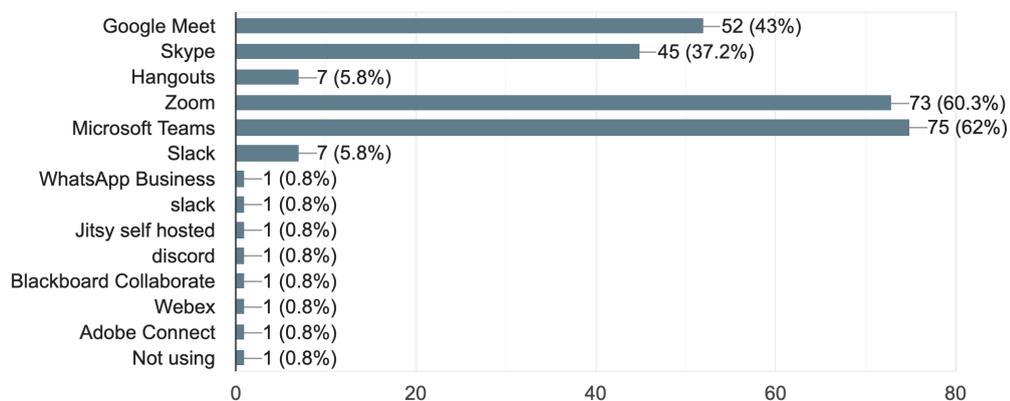


Figure 10. Products for Cloud Communication for Business

86.3% of the participants think that cloud communications services are crucial for businesses. Figures show that having online meetings can save a considerable amount of time for the participants.

Please rate the importance of using cloud communication services for business (1-Not important at all, 5-Very important)

124 responses

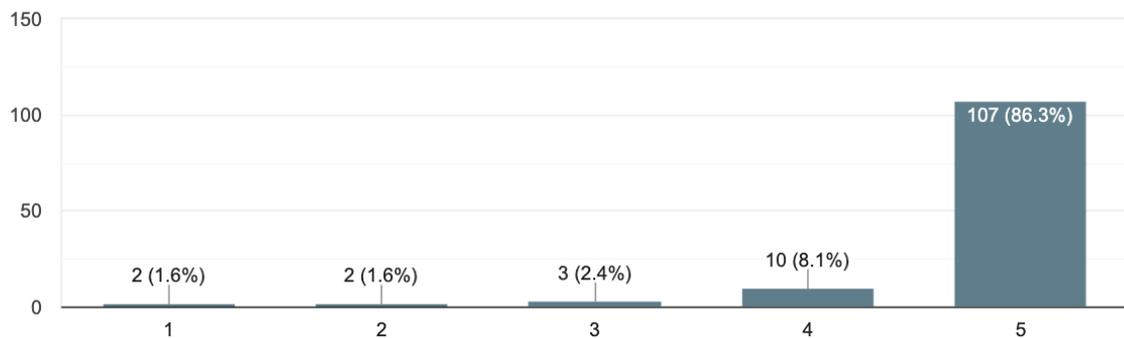


Figure 11. Usage of Cloud Services Frequency for Business

Especially during the Covid-19 pandemic, most companies prefer to hold online meetings because the majority of the employees are either prohibited from going to the office or simply do not prefer being at the office.

2.2.3. Cloud Service Usage for Personal

The survey showed that nearly all of the participants use cloud storage and cloud communication services in their personal lives.

96.8% of the participants said they are using cloud storage services, and 94.4% of them use cloud communication tools for personal use.

The most common cloud storage product for personal use is Google Drive (91.7%), followed by Onedrive (40%), iCloud (35%), Dropbox (35%), and others.

If yes, please specify the product(s) you use
 120 responses

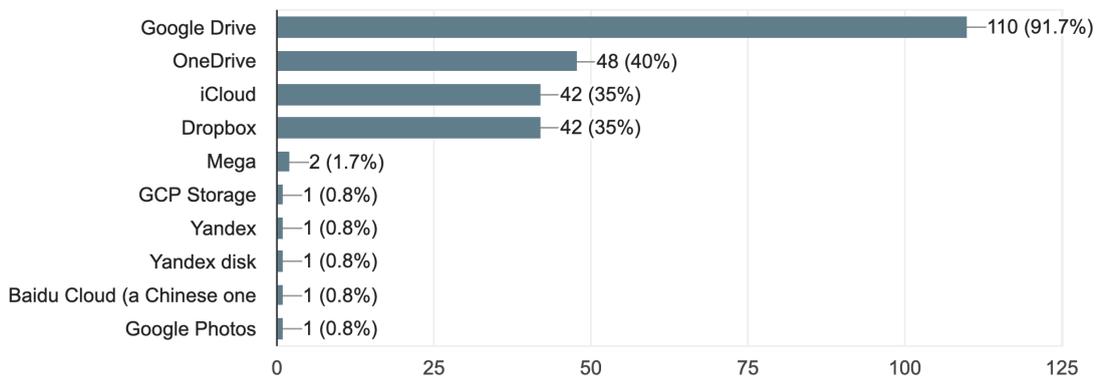


Figure 12. Cloud Storage for personal use

Most of the participants selected Zoom as their preferred cloud communication tool for personal use (66.9%), followed by Skype (59.3%), Google Meet (40.7%), Microsoft Teams (25.4%), and others.

If yes, please specify the product(s) you use
 118 responses

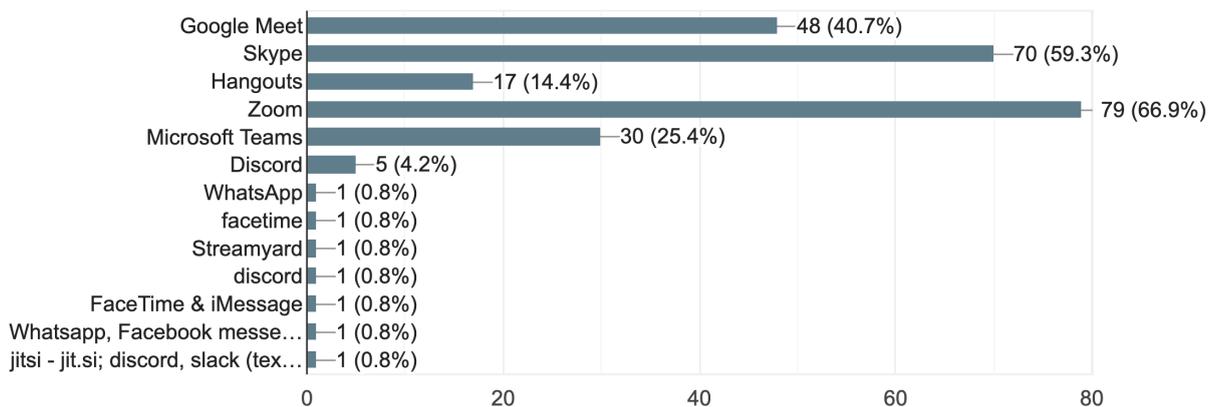


Figure 13. Cloud communication services for personal use

The percentages of cloud storage and communication products are in business and personal usage. People might tend to use the same products for the same purpose in their business and personal lives.

2.2.4. Effects of Covid-19 Pandemic to Cloud Service Usage

The survey included questions about the relation between the Covid-19 pandemic and cloud services used to understand participants’ approaches better.

49.2% of the participants indicated that their usage of cloud services had increased dramatically during the Covid-19 pandemic. In addition, 26.6% of them agreed on the increase in the use of cloud services.

How has your cloud services usage changed during Covid-19 pandemic? (1-Decreased dramatically, 5-Increased dramatically)

124 responses

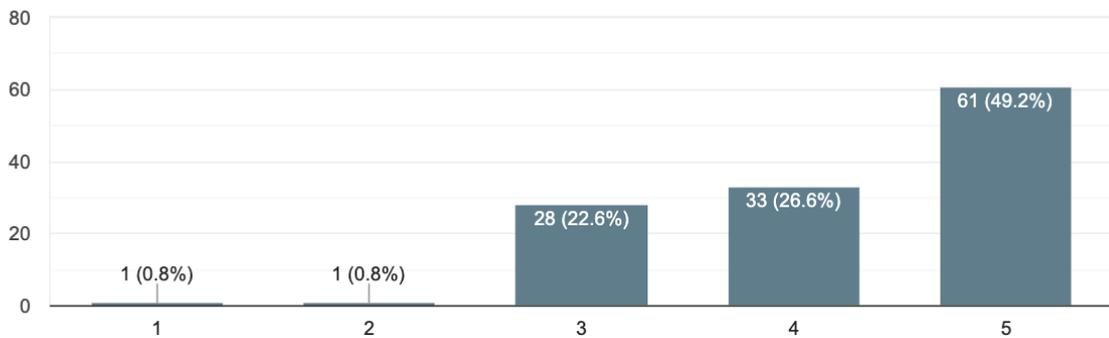


Figure 14. Effect of Cloud Services During Covid-19 Pandemic

68.5% think that cloud services have been helping them a lot during the pandemic and %21 of the participants accepted the contribution of cloud services in the same period.

Do you think cloud services help you during Covid-19 pandemic? (1-Not at all, 5-A lot)

124 responses

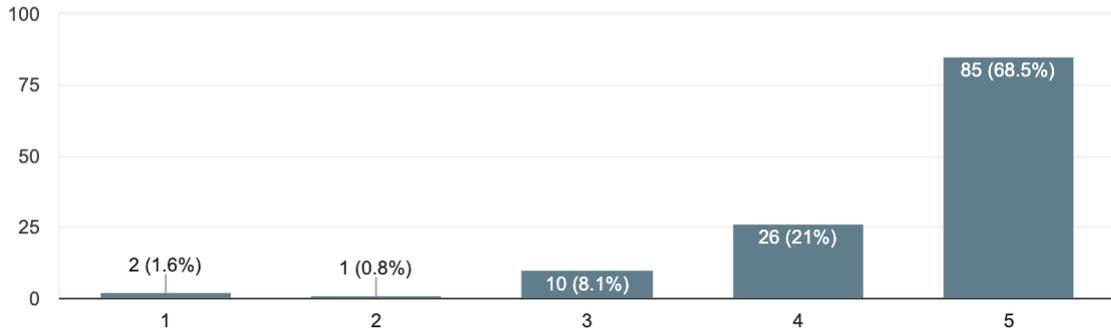


Figure 15. The help of Cloud Services During Covid-19 Pandemic

According to participants, cloud services helped them mostly in communication (%87.4), business (%62), and education (%53.8). During the global pandemic, many people had to and still have to continue the communication between their friends, families, or colleagues without physical interaction. Cloud communication tools give people a chance to maintain their daily routines over the internet. During the pandemic, cloud communication tools have been utilized to maintain daily routines over the internet. For example, many educational institutes and businesses have decided to continue their activities online with the help of cloud services.

If yes, in which area did cloud services help you?
 119 responses

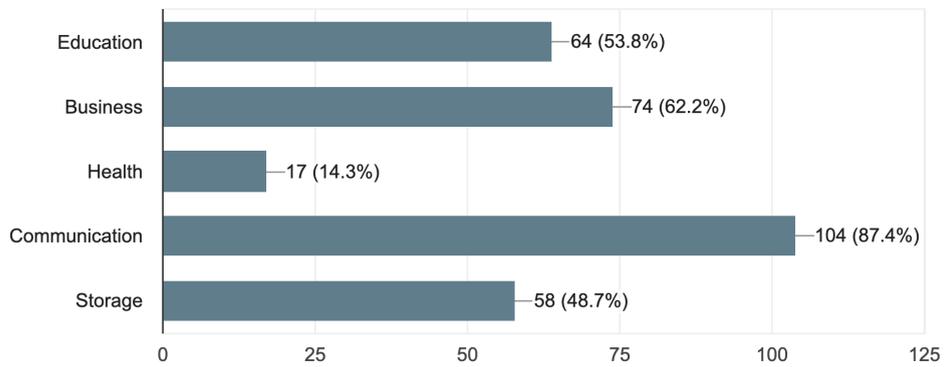


Figure 16. Usage Area of Cloud Services During Covid-19 Pandemic

In total, 60.5% of the participants think that their awareness about cloud services increased during the Covid-19 pandemic (39.5% of the participants agreed strongly, and 21% agreed).

My awareness about cloud services has increased during Covid-19 pandemic (1-Not at all, 5-Definitely true)

124 responses

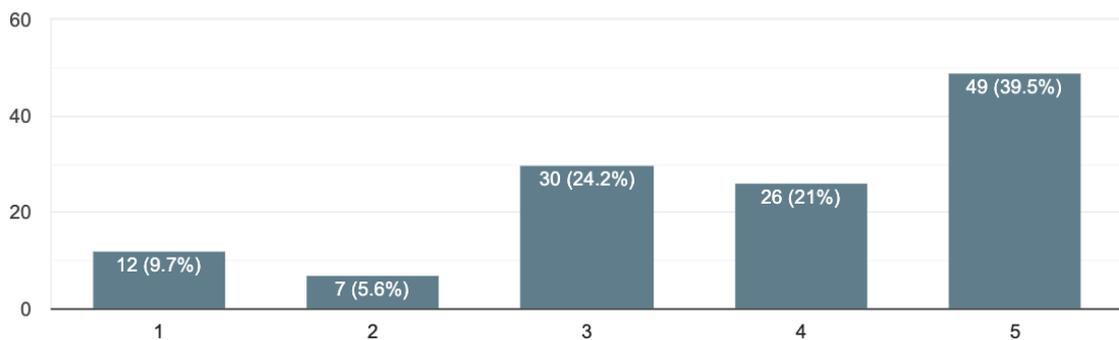


Figure 17. Awareness of Cloud Services During Covid-19 Pandemic

As a result of the restrictions brought by the pandemic, people are encouraged to use cloud services to keep up with their daily activities and keep the pace of their daily communication, business, or education as close to pre-Covid. Therefore, people have been triggered to use cloud services more frequently when compared to “before-Covid” times.

2.2.5. Concern and Benefits About Cloud Services

Although the increased usage of cloud services and the overall positive thoughts surrounding them, most of the participants reported concerns about cloud using services. It may be that some people, especially older generations who were not very familiar with cloud services pre-Covid, had been newly introduced to these services, and now they have been questioning the reliability of these services. Even though they were familiar with cloud services pre-Covid, some people might have started using these services more often, which leads them to think about these services and question their trustworthiness. In addition, people see much news about data leakage or hacking about cloud services in the media which may easily and severely damage the reputation of cloud services and create suspicion towards their reliability.

Most of the participants stated that they trust the security of cloud services with a percentage of %46 in total, and many of them (40.3%) indicated that they do not have big trust issues related to cloud services.

Do you trust the security of cloud services? (1-Not at all, 5-A lot)

124 responses

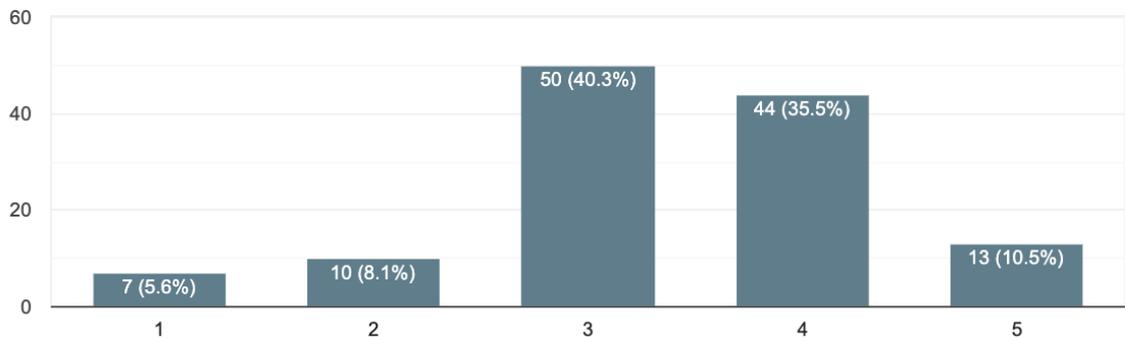


Figure 18. Trust the Security of Cloud Services

According to the survey, the most important barrier for cloud usage is security, with %55 percentage, followed by performance (%48) and trust (47%).

What concerns can be barrier for cloud usage?

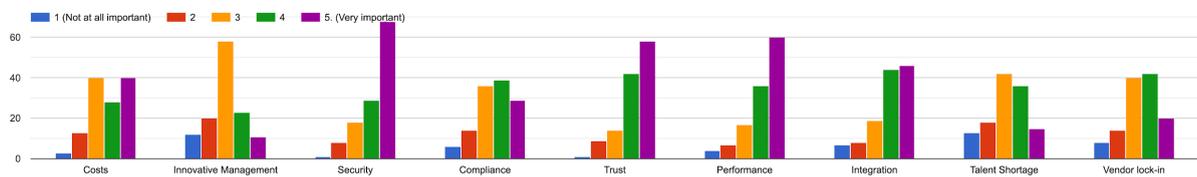


Figure 19. Concerns related to Cloud Services as a Barrier

The majority of the participants think that data privacy/confidentiality, hijacking of accounts, and data loss/leakage are the most important security issues related to cloud services, with the 68% percentage followed by cyberattacks (57%), External Sharing of Data (51%), Legal and Regulatory Compliance (47%) and Lack of Visibility (29%).

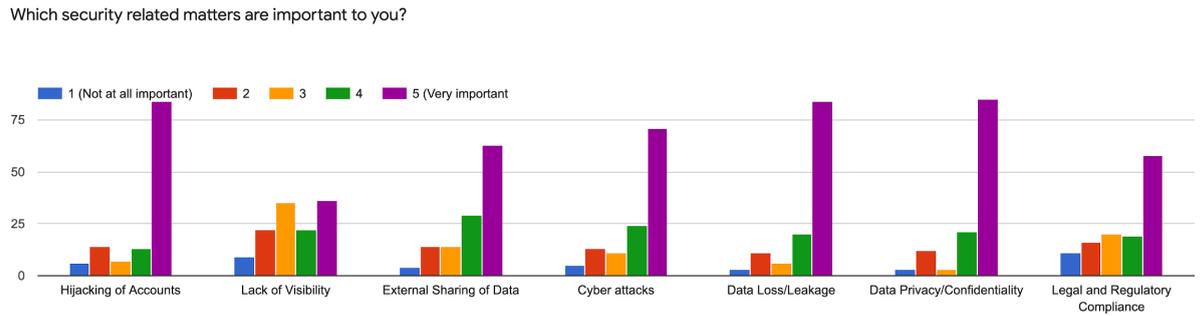


Figure 19. Security Matters of Cloud Services

Participants think that the most important advantage of cloud services for organizations is increased collaboration between teams with a 51% percentage.

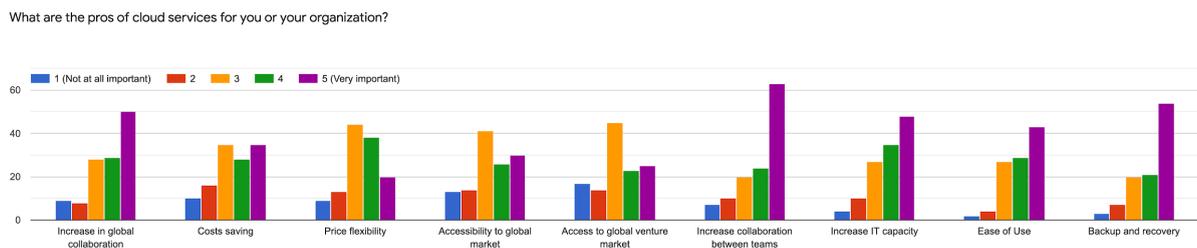


Figure 21. Pros of Cloud Services for the Organization

Most of the participants think that cloud services positively impact backup/recovery (43%) and an increase in global collaboration (40%).

2.3. Qualitative Analysis

During the interviews, the impacts of using cloud services for everyday work were addressed with the main titles like the impacts of cloud communication and storage services inside the business process, the advantages and disadvantages of using cloud services, concerns related to security, vendor locked-in, etc. about cloud services and benefits of cloud

services during Covid-19 pandemic. To be able to obtain more profound answers, questions were asked as open-ended.

2.3.1. Usage of Cloud Service Tools

According to the interviewees, cloud service tools have become one of the indispensable business tools within companies. All of the interviewees are working for companies that have SaaS (Software as a Service) products. That is why they are benefiting from cloud services in a wide range.

Firstly, all of them are using one or more cloud platforms such as Amazon Web Services (AWS), Google Cloud Platform (GCP), or Microsoft Azure for development purposes, communication tools, and storage. They have SaaS products, so they are using cloud platforms to deploy their products and enter global markets as well.

In addition to cloud platforms, they are using different cloud tools. Atlassian tools like Jira and Confluence are popular to manage software development planning and documentation. Miro is used by the companies as a virtual whiteboard for brainstorming and project management. Figma and Sketch, which enable working collaboratively, are preferred as design tools. One of the interviewees who is working for an Internet of Things (IoT) start-up mentioned that "Cloud services are also essential to increase the efficiency of the development process and keep it reliable." The same interviewee stated that they are using GitHub for development processes.

2.3.2. Usage of Cloud Communication Services

Usage of cloud services for communication purposes is significantly crucial for the interviewees. The common idea is that cloud communication services increase collaboration

and communication within the company. It is critical because all of them have offices outside of Estonia. Cloud communication services allow them to continue their business processes and meetings without location bottlenecks. In addition, the interviewee who is working for a telecommunication start-up mentioned that "It is not easy to give a presentation to 100, 200, or more people without video conferencing tools."

The most used cloud communication services as video conferencing tools are Google Meet, Microsoft Teams, Skype, Zoom. Companies can organize meetings easily without physical borders with these tools. Moreover, most of them have recording options, so it is possible to watch or share the meetings in the future.

Companies are not using only video conferencing tools as cloud communication services. They are using communication services for written communication as well. Slack is very popular amongst them for communication inside companies, teams, or individually. The interviewee who is working for an Internet of Things (IoT) start-up highlighted that their primary communication happens in Slack.

2.3.3. Usage of Cloud Storage Services

Another critical aspect of cloud services for companies is storage services. Because companies might need big storage spaces for their technical and non-technical files, all of them are using cloud services for storage to save money and physical space. Cloud storage services help them to store and share the files needed quickly. In addition, The interviewee who is working an Internet of Things (IoT) start-up mention that "With cloud storage services, we are able to work on the same files collaboratively and track the files' history."

The most common cloud storage tools are Google Drive and Microsoft OneDrive. According to interviewees, the integration between storage tools and communication tools makes the processes easier.

2.3.4. Benefits of Cloud Services

All three managers of the start-ups agreed that using cloud services is crucial for their businesses. Accessibility is one of the most important benefits for them. They stated that everyone could be reached easily via cloud communication tools, and files could be shared easily with relevant people. These features gain time and money for the companies, according to interviewees.

One of the interviewees who is working for a fintech start-up stated that they exist because of cloud services. Their platform is working on cloud services, so simply, it enables them to develop the products and reach their product to the customers. According to the same interviewee, "Cloud services created a new ecosystem for the banking industry and enabled new players to join the industry with open banking solutions." She mentioned that it also makes global cooperation possible for companies.

The other significant benefit of cloud services is increasing productivity depending on interviewees' opinions. With cloud services, they save time, so focusing on their tasks is more effortless. The interviewee who is working for a telecommunication start-up mentioned that "You do not have to hire huge servers and huge storage in your office physically if you are using cloud services. It makes processes faster and simpler."

2.3.5. Disadvantages and Concerns of Cloud Services

The biggest concern about the usage of cloud services is vendor lock-in. There are not so many cloud service providers, and changing cloud service providers is a huge task.

Because of it, the interviewee who is working for an Internet of Things (IoT) start-up stated that "Our work mostly depends on the service providers' conditions. If there is any failure or blockage, I am sure that it might affect our product or processes."

One of the interviewees who is working for a fintech start-up mentioned that "We have so many subscriptions for different kinds of products. Tracking all of them and also making customization for different SaaS products can be confusing sometimes."

Surprisingly, security is not a big problem for the interviewees. They stated that the cloud service providers are trustful in general, and they have many different certifications related to security issues.

2.3.6. Usage of Cloud Services Covid-19 During Pandemic

According to the interviewees, they were able to continue their work thanks to cloud services. Especially, cloud communication services enabled them to continue their meetings, plannings, and collaboration within the company as usual. Not only communication services but also collaboration services such as Google Docs, Google Sheets, Microsoft Excel, etc., helped them to work on the same documents and keep them updated. The interviewee who is working for an Internet of Things (IoT) start-up stated that "We reduced the time spent on the meetings because using cloud collaboration tools is more efficient."

In addition, almost all cloud tools are accessible via different devices such as mobiles, tablets, etc. They can easily reach documents, files, tools, and people without physical borders. The interviewee who is working for a fintech start-up mentioned that "Using cloud services creates a more stress-free working environment for us during the Covid-19 pandemic because accessibility for the systems is easier."

3. Conclusion

Cloud services have become crucial for many industries in recent years, and their importance is increasing day by day. Nowadays, start-ups contribute to the developments in innovation and technology areas more than ever. However, there was insufficient academic research to explain the correlation between cloud services and start-ups specifically. In the first part, the aim of the study is presented with the research questions, and the historical background of cloud services is introduced.

In the second part, the definition, aspects, and processes of cloud services are explained by the literature review. In this section, to be able to explain clearly the importance and benefits of cloud services for start-ups, the technical background of these services is not focused on. Each of the essential characteristics, deployment models, and services models have been explained with academic research conducted on the existing libraries. Furthermore, academic approaches for the benefits and challenges of cloud services have been analyzed and described in this section.

To be able to find answers to research questions and support ideas, two different analysis methods have been performed. In the first part of the analysis, an online survey was conducted to collect quantitative data among 124 participants. According to the survey, it was seen that most of the participants are using cloud services in their personal and also business lives. The varieties or brands of the services which are used by them have some variety, but the aim of the services is based on the same reasons. According to the results of the survey, most of the participants trust the security of cloud services. The basis for this trust might be based on the trust for the companies because most cloud services are owned by big tech companies such as Google, Microsoft, and Amazon. People might tend to trust the

companies' security policies or technologies. However, the biggest concern related to cloud services is still security. This concern might be related to mostly data privacy, hijacking of the accounts, and data loss because many people are dealing with hackers to protect their accounts on social media, banks, or subscriptions. In addition, people may not know how to protect their accounts by increasing their accounts' security level. Depending on the survey's answers, the most important advantage of cloud services for organizations is to increase collaboration. The biggest reason behind it might be the effectiveness of cloud communication services.

In the second part of the analysis, three different interviews were conducted with Estonian start-ups to be able to make a qualitative analysis. It has been observed that they have similar opinions about cloud services for both benefits and disadvantages of cloud services. However, they all agreed that the usage of cloud services is not only important for them, but it became an obligation to be able to increase or maintain their businesses. All of these three companies have software-as-a-service (SaaS) products, so all of them are able to pitch, validate and develop their ideas thanks to cloud services. According to interviewees, the usage of cloud services increases their productivity, collaboration, the efficiency of working processes. Especially, communication tools are significantly essential to increase the collaborations within the company and external contributors. Because it saves time to set and execute the meetings efficiently without the location and the number of the participant limitation. In addition, it is understood that without cloud services, storage might have been a big problem for the companies. Most of them use cloud storage services not only for storing their files but also for sharing and tracking them among many users. Cloud services are decreasing costs and saving time, according to interviewees. The most significant disadvantage of using cloud services is vendor lock-in. Because cloud services mainly

depend on the service provider, there are not many different services providers apart from well-known technology companies. Security was not mentioned as a big concern because service providers are able to provide reliable certifications related to the security of their systems.

Additionally, in both online survey and interviews, the impact of cloud services during the Covid-19 pandemic has been questioned. Both individual participants and the start-ups have the same ideas about the benefits of cloud services during the pandemic. Firstly, they have started to benefit from cloud services more during the Covid-19 pandemic compared to the past. During this duration, the most important benefit of the services is enabling communication to continue. Both individuals and businesses had to communicate with each other, and cloud communication services played a significantly important role in making it happen. In addition, cloud services contributed to continuing and even increasing the collaboration during Covid-19. With the help of cloud service tools, people were able to complete their daily tasks not only for their business life but also for their personal life so people could overcome the impacts of Covid-19 more smoothly and with less loss.

3.1. Limitations and Future Research

The sources about cloud services were limited for start-ups and entrepreneurs for the literature review part. In addition, most of the academic articles related to cloud services were more technical than expected. Even though data gathered from both online survey and interviews satisfied the research questions, the thesis had some critical limitations. The thesis was limited by the number of participants for both survey and interviews. Firstly, the survey was conducted in a short timeframe, and the channels to find respondents were limited. As a natural consequence of these limitations, the number of respondents for the survey was limited by 124.

Secondly, it was challenging to find interviewees who would like to answer the questions and spend time. In total, 21 start-ups from Estonia were contacted to invite them to the interview. Only 3 out of 21 start-ups were accepted to have an interview. Although all of these start-ups are suitable for the aim of the thesis, the number of total interviewees is not enough to generalize the results for all start-ups or entrepreneurs.

The scope, varieties, and usage areas of cloud computing technologies and services are increasing day by day. That is why it is significantly important to be updated about cloud computing and services developments. The time allocated and the channels used to share the survey might be increased to get more answers in future researches. In addition, the interviews were limited by Estonian start-ups. To be able to increase the number of interviewees, the aimed locations might be increased.

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APPENDIX A. Survey Questions

Cloud Services Usage Survey

Hi! I am Mert Sahindogan. I am a master's degree student at University of Tartu. I need to collect user data about cloud services usage to use in my thesis. If you have a question about the survey, please contact me at mert.sahindogan@gmail.com

The survey will take approximately 5 minutes.

 mert.sahindogan@gmail.com (not shared) [Switch account](#)



* Required

What country do you live in? *

Choose



What industry do you work in? *

- Education
- Banking and Financial Services
- Transportation
- Research and Development
- Telecommunication
- Transportation and Logistics
- Insurance
- Non-Governmental Organization (NGO)
- Media
- Production
- Construction
- Information Technology
- Other: _____

What department are you in? *

- IT
- Management
- Finance
- Sales
- Design
- Human Resources
- Operation
- Marketing
- Other: _____

How many people are working in your organization? *

- 1-10
- 11-20
- 21-30
- 31-50
- 51-100
- 100-251
- 251+

What is your role? *

- Accountant
- Architect
- Business analyst
- C-Level Executive
- Civil Engineer
- Consultant
- Content manager
- Copywriter
- Customer service representative
- Data Analyst
- DevOps Engineer
- Entrepreneur
- Finance manager
- Financial Analyst
- Human resource personnel
- Human resources manager
- Manager
- Marketing manager
- Marketing specialist
- Mechanical Engineer
- Operational roles
- Operations Manager
- Product manager
- Production Engineer
- Project manager
- QA Engineer
- Researcher
- Sales Engineer
- Sales representative
- Software developer
- UX/UI Designer

Is your company using cloud services? *

- Yes
- No
- I don't know
- No, but we are planning to use

If your organization uses cloud services, please indicate the type of cloud services

- SaaS (Software as a Service)
- PaaS (Platform as a Service)
- IaaS (Infrastructure as a Service)
- I don't use them
- I don't know
- Other: _____

What topic/relations do you have related to cloud services for your company or role? *

- I am using them for communications
- I am using them for storage
- I am developing cloud services/solutions
- I am using them to optimize processes
- I don't use them
- Other: _____

Cloud Storage

Do you use cloud storage services such as Google Drive, OneDrive, iCloud, etc. for personal use? *

- Yes
- No

If yes, please specify the product(s) you use

- Google Drive
- OneDrive
- iCloud
- Dropbox
- Other: _____

Please rate the importance of using cloud storage for personal use *

- 1 2 3 4 5
- Not at all important Very important

Do you use cloud storage services such as Google Drive, OneDrive, iCloud, etc. for business? *

- Yes
- No

If yes, please specify the product(s) you use

- Google Drive
- OneDrive
- iCloud
- Dropbox
- Other: _____

Please rate the importance of using cloud storage for business *

	1	2	3	4	5	
Not at all important	<input type="radio"/>	Very important				

Cloud Communication

Do you use cloud communication tools such as Google Meet, Skype, Hangouts, Zoom, etc. for personal use? *

- Yes
- No

If yes, please specify the product(s) you use

Google Meet

Skype

Hangouts

Zoom

Microsoft Teams

Other: _____

Please rate the importance of using cloud communication services for personal use *

1 2 3 4 5

Not at all important Very important

Do you use cloud communication tools such as Google Meet, Skype, Hangouts, Zoom, etc. for business? *

Yes

No

If yes, please specify the product(s) you use

Google Meet

Skype

Hangouts

Zoom

Microsoft Teams

Other: _____

Please rate the importance of using cloud communication services for business *

1 2 3 4 5

Not at all important Very important

Covid-19 Pandemic

How has your cloud services usage changed during Covid-19 pandemic? *

1 2 3 4 5

Decreased dramatically Increased dramatically

Do you think cloud services help you during Covid-19 pandemic? *

1 2 3 4 5

Not at all A lot

If yes, in which area did cloud services help you?

- Education
- Business
- Health
- Communication
- Storage
- Other: _____

My awareness about cloud services has increased during Covid-19 pandemic *

1 2 3 4 5

Not at all Definitely true

Concerns and benefits

Do you trust the security of cloud services?

	1	2	3	4	5	
Not at all	<input type="radio"/>	A lot				

Which security related matters are important to you? *

	1 (Not at all important)	2	3	4	5 (Very important)
Hijacking of Accounts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of Visibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
External Sharing of Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cyber attacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Loss/Leakage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Privacy/Confidentiality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal and Regulatory Compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What concerns can be barrier for cloud usage? *

	1 (Not at all important)	2	3	4	5. (Very important)
Costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovative Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talent Shortage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vendor lock-in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What are the pros of cloud services for you or your organization? *

	1 (Not at all important)	2	3	4	5 (Very important)
Increase in global collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs saving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price flexibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility to global market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to global venture market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase collaboration between teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase IT capacity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backup and recovery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX B. Interview Questions

1. What topic/relations do you have related to cloud services for your company or role?
2. Have you benefited from any cloud services in the first stage of your work? Was it an initiator factor for you? If yes, Could you please give some examples?
3. Could you please specify the type of cloud services that you are using and why?
4. Are you using cloud storage services such as Google Drive, OneDrive, iCloud, etc. for personal usage or inside the company? If yes, how often do you use them?
 - a. What are the advantages of using cloud storage for you?
 - b. What are the disadvantages of using cloud storage for you?
5. Are you using cloud communication services such as Google Meet, Skype, Hangouts, Zoom, etc. for personal usage or company communication? If yes, how often do you use them?
 - a. What are the advantages of using cloud communication services for you?
 - b. What are the disadvantages of using cloud communication services for you?
6. What benefits of cloud service do you recognize?
 - a. increase in global collaboration?
 - b. costs reduction
 - c. scalability
 - d. accessibility to global market
 - e. access to global venture market
 - f. Other (please, specify)
7. Did you have any negative effects of cloud services? (open question or with answers)
 - a. technology adoption

- b. security concerns
 - c. other (please, specify)
8. Do you trust cloud services in privacy?
- a. What security aspects are important for you?
 - b. How can you understand the security of cloud services?
9. Could you please give some examples of the cloud services that you are using actively?
10. How do you use Cloud Services during the Covid-19 pandemic? Are they helping you to deal with the problems related to the pandemic?

Resümee

KUIDAS PILVETEENUSTE TEHNOLOOGIAD AITAVAD ETTEVÕTLUSEL KASVADA

Mert Şahindoğan

Ettevõtjad ja iduettevõtted peavad kasutama oma ressursse arendusprotsessides tõhusalt, et saavutada oma toodete või teenuste kasvatamisel optimaalne edu. Käesolev magistritöö annab ülevaate pilveteenuste tehnoloogiate mõjust ettevõtjate ja idufirmade kasvule tehnilisest ja juhtimisasest vaatenurgast. Eesmärgi saavutamiseks viidi läbi veebiküsitlus 124 vastajaga ja intervjuud Eesti kolme iduettevõtte esindajaga.

Veebiküsitluse ja intervjuude analüüsi tulemused annavad ülevaate, et pilveteenustel on positiivne mõju inimeste omavahelisele koostööle ja suhtlusele ning andmete talletamisele. Pilveteenustega seotud positiivsed küljed domineerivad üle nende kasutamisest tingitud võimalikud murekohad. Lisaks näitavad saadud tulemused, et pilveteenuste kasutamine erinevatel eesmärkidel on muutunud üksikisikute ja idufirmade/ettevõtjate jaoks igapäevaelu oluliseks osaks, seda eriti Covid-19 pandeemia ajal.

Võtmesõnad: pilveteenused, pilvandmetöötlus, pilvetehnoloogia, ettevõtlus, iduettevõtte, Covid-19, pandeemiad, kommunikatsioon, andmete ladustamine.

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