



Kaunas University of Technology

School of Economics and Business

Overcoming Challenges of Using Video Conferencing Technology in Small and Medium-Sized Enterprises

Master's Final Degree Project

Kasparas Žemaitis

Project author

Prof. dr. Jurgita Sekliuckienė

Supervisor

Kaunas, 2022



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Supervisor

**Prof. Dr. Vilmantė Kumpikaitė-
Valiūnienė**

Reviewer

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Kasparas Žemaitis

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Summary

In recent years, due to various circumstances in the world, one of the information and communication technologies - video conferencing technology - has become very popular. This technology has changed long-established working methods, made it possible to work remotely from home or have meetings with representatives in another part of the world. Digital education enterprises are no exception. This type of business has grown exponentially due to the consequences of the COVID19 pandemic when students were unable to have tutoring lessons. However, digital education companies have faced some challenges in implementing video conferencing technology. The scientific literature focuses on all information and communication technologies and their adaptation in public sector institutions, but not in companies. Insufficient attention paid by researchers to the challenges and solutions to the process of implementing videoconferencing technology in the company is the main problem examined in this project. The object of this study is to address the challenges facing the enterprise in implementing video conferencing technology in small and medium-sized digital education enterprises.

Aim of the final degree project

To provide theoretical and empirical implications on adopting video conferencing tools in Small and medium-sized enterprises seeking firms' development

Objectives

1. To find out the problems and relevance of video conferencing in small and medium enterprises;
2. To find out the theoretical basis of adoption of information and communication technology tools for the company's development, focusing on video conferencing tools;
3. To substantiate the methodology of empirical research;
4. Propose solutions to the challenges of implementing videoconferencing technology in small and medium-sized digital education companies.

Research method

An analysis of the theoretical literature has been carried out to identify challenges and solutions for the implementation of videoconferencing tools in small and medium-sized digital education enterprises. Based on the findings, a theoretical model was constructed from the literature analysis. Based on the findings of the theoretical analysis, a qualitative research method was chosen. Representatives of four digital education companies who were involved in the implementation of videoconferencing tools were interviewed. The "MAXQDATA" program was used to process the results of the empirical study, to align the data, to find the data links and to encode the data.

Structure of the thesis

This work consists of four main parts: analysis of the problem of the analyzed topic, theoretical analysis, research methodology and review of research results. The work also includes an introduction, conclusions, a list of references and an appendix. In the problem analysis, practical examples are reviewed, which describe the problem of the analyzed topic and its relevance. The second part of the work analyzes the theoretical literature, which presents the main challenges and solutions for adapting videoconferencing tools in small and medium-sized enterprises. The third part describes the methodology of empirical research. The fourth part describes the results of the empirical research and provides recommendations.

Results

In order to find out the challenges faced by digital education companies adapting videoconferencing technologies, four companies established in Lithuania but operating in other countries were interviewed. A qualitative study using the semi-structured interview method showed that at least one of the surveyed companies that implemented video conferencing in their company faced the challenges analyzed in the theory and depicted in the theoretical model. The research and analysis of the theoretical literature revealed that the main challenges faced in the adoption of video conferencing in the company are low information technology infrastructure, low information technology knowledge, lack of process implementation skills, lack of budget, expensive equipment and software, low software selection and poor adaptability.

Žemaitis Kasparas. Iššūkių, susijusių su vaizdo konferencijų technologijų naudojimu, įveikimas smulkiose ir vidutinėse įmonėse. Magistro baigiamasis projektas / vadovė Prof. dr. Jurgita Sekliuckienė; Kauno technologijos universitetas, Ekonomikos ir verslo fakultetas.

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Santrauka

Pastaraisiais metais dėl įvairių pasaulyje susiklosčiusių aplinkybių itin išpopuliarėjo viena iš informacinių ir komunikacinių technologijų priemonių - vaizdo konferencijų technologija. Ši technologija pakeitė senai nusistovėjusius darbo metodus, leido įgalinti nuotolinį darbą iš namų ar turėti susitikimus su kitame pasaulio krašte esančiais atstovais. Skaitmeninio švietimo (angl. digital education) verslai taip pat nėra išimtis. Šio tipo verslai itin išaugo dėl COVID19 pandemijos pasekmių kuomet mokiniai negalėjo turėti papildomų pamokų. Tačiau skaitmeninio švietimo įmonės diegdamos vaizdo konferencijų technologijas susidūrė su tam tikrais iššūkiais. Mokslinėje literatūroje didžiausias dėmesys skiriamas visoms informacinėms ir komunikacinėms technologijoms bei jų adaptacijai valstybinio sektoriaus įstaigose, tačiau ne įmonėse. Mokslininkų skiriamas nepakankamas dėmesys vaizdo konferencinių technologijų diegimo procesui įmonėje iškilusiems iššūkiams bei sprendiniams yra pagrindinė šiame darbe nagrinėjama problema. Šio tyrimo objektas yra išsiskirti įmonėje kylančius iššūkius diegiant vaizdo konferencijų technologijos priemones, mažose ir vidutinėse skaitmeninio švietimo įmonėse.

Tyrimo tikslas

Pateikti teorinius ir empirinius vaizdo konferencijų technologijų diegimo vadybinius sprendimus mažose ir vidutinėse įmonėse, siekiančiose įmonių plėtros.

Uždaviniai:

1. Išsiaiškinti vaizdo konferencijų problematiką bei aktualumą mažose ir vidutinėse įmonėse;
2. Išsiaiškinti informacinių ir komunikacijos technologijų priemonių naudojimą įmonės vystymuisi teorinius pagrindus, orientuojantis į vaizdo konferencijų priemones;
3. Pagrįsti empirinio tyrimo metodiką;
4. Pasiūlyti sprendimus į iškilusius iššūkius diegiant vaizdo konferencijų technologijas mažose ir vidutinėse skaitmeninio švietimo įmonėse.

Tyrimo metodai

Atlikta teorinės literatūros analizė, siekiant nustatyti iššūkius ir sprendimus diegiant vaizdo konferencijų priemones mažose ir vidutinėse skaitmeninio ugdymo įmonėse. Remiantis išvadomis, iš literatūros analizės buvo sudarytas teorinis modelis. Remiantis teorinės analizės išvadomis, pasirinktas kokybinis tyrimo metodas. Buvo apklausti keturių skaitmeninio ugdymo įmonių atstovai, kurie dalyvavo diegiant vaizdo konferencijų priemones. Empirinio tyrimo rezultatams apdoroti,

duomenims sugretinti, duomenų nuorodoms surasti ir duomenims koduoti naudota programa „MAXQDATA“.

Darbo struktūra

Darbą sudaro keturios pagrindinės dalys: nagrinėjamos temos problemos analizė, teorinė analizė, tyrimo metodika ir tyrimo rezultatų apžvalga. Darbą taip pat sudaro įvadas, išvados, literatūros sąrašas ir priedas. Problemos analizėje apžvelgiami praktiniai pavyzdžiai, apibūdinantys nagrinėjamos temos problemą ir jos aktualumą. Antroje darbo dalyje analizuojama teorinė literatūra, kurioje pateikiami pagrindiniai iššūkiai ir sprendimai pritaikant vaizdo konferencijų priemones mažose ir vidutinėse įmonėse. Trečioje dalyje aprašoma empirinio tyrimo metodika. Ketvirtoje dalyje aprašomi empirinio tyrimo rezultatai ir pateikiamos rekomendacijos.

Rezultatai

Siekiant išaiškinti kokie iššūkiai kilo skaitmeninio švietimo įmonėms diegiančioms vaizdo konferencijų technologijas buvo apklaustos keturios įmonės įsteigtos Lietuvoje, tačiau savo veiklą vykdančios ir kitose šalyse. Atliktas kokybinis tyrimas, naudojant pusiau struktūrinio interviu metodą, parodė, jog bent viena iš apklaustų įmonių, kurios diegėsi vaizdo konferencijų priemones savo įmonės veikloje susidūrė su teorijoje išanalizuotais ir teoriniame modelyje pavaizduotais iššūkiais. Atlikus tyrimą ir teorinės literatūros analizę nustatyta, jog pagrindiniai iššūkiai su kuriais susiduriama diegiant vaizdo konferencijų priemones įmonėje yra žema informacinių technologijų infrastruktūra, žemos informacinių technologijų žinios, procesų diegimo įgūdžių trūkumas, biudžeto stygius, brangi įranga ir programos, mažas apsirinkimas programinės įrangos bei prastas pritaikomumas.

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Introduction

Relevance of the selected topic

Technology is one of the reasons why today's world is running faster than before. There are many types of technology, but information and communication technology that enable more efficient information exchange are contributing to high-speed improvements. The information and communication technology group includes communication tools such as e-mail, instant messaging, video conferencing, and more. (Laudon, 2020).

Small and medium-sized enterprises also play an important role in the global economy. According to Zafar (2018), in well-developed countries, 90% of all registered businesses are small and medium-sized enterprises, which is extremely important for the country's economic level. An analysis of the various literature has shown that the growth of small and medium-sized enterprises is most influenced by factors such as management, employees, marketing, innovation and one of the most important factors is technology.

The research conducted by Barba-Sánchez (2018) shows that the implemented information and communication technology in the organization allows the business to stand out from the competition, reduce costs, increase efficiency as well as revenue, and allows the organization to achieve better results. Of course, the implementation of such technologies may change the business model. (Laudon, 2020).

Computing, high-speed networking, and high-bandwidth video conferencing tools have become increasingly relevant in many organizations, including businesses, schools, hospitals, universities and among others, because of technological progress in many countries, particularly in developing countries. Nevertheless, though with a strong network, the use of some video conferencing technologies may result in a variety of distinct experiences depending on the purpose of the meeting and the surrounding environment. (Al-Samarraie, H., 2019)

The benefits of information and communication technology have been measured in many studies, but there is not much information on whether it is easy for companies, especially small and medium-sized ones, to implement such and similar technologies in their processes. It is also important to find out what factors hinder the implementation of video conferencing in the company's processes. Casio (2016) wrote that computing opens the way to new stages, but we need to focus and understand how this can disrupt the workflow in a company.

The research problem

How are video conferencing tools adopted at small and medium sized digital education enterprises in Lithuania

Subject matter

Implementation of the video conferencing in small and medium size enterprises.

Aim of the final degree project

To provide theoretical and empirical implications on adopting video conferencing tools in Small and medium-sized enterprises seeking firms' development

Objectives of the final degree project:

1. To find out the relevance of video conferencing in small and medium enterprises;
2. To find out the theoretical basis of adoption of information and communication technology tools for the company's development, focusing on video conferencing tools;
3. To develop a model that would reveal barriers and solutions to the adoption of video conferencing in small and medium-sized enterprises;
4. To perform an empirical analysis of the adaptation of video conferencing methods in small and medium-sized digital education enterprises.

Research method

An analysis of the theoretical literature has been carried out to identify challenges and solutions for the implementation of videoconferencing tools in small and medium-sized digital education enterprises. Based on the findings, a theoretical model was constructed from the literature analysis. Based on the findings of the theoretical analysis, a qualitative research method was chosen. Representatives of four digital education companies who were involved in the implementation of videoconferencing tools were interviewed. The “MAXQDATA” program was used to process the results of the empirical study, to align the data, to find the data links and to encode the data.

Structure of the thesis

This work consists of four main parts: analysis of the problem of the analyzed topic, theoretical analysis, research methodology and review of research results. The work also includes an introduction, conclusions, a list of references and an appendix. In the problem analysis, practical examples are reviewed, which describe the problem of the analyzed topic and its relevance. The second part of the work analyzes the theoretical literature, which presents the main challenges and solutions for adapting videoconferencing tools in small and medium-sized enterprises. The third part describes the methodology of empirical research. The fourth part describes the results of the empirical research and provides recommendations.

Research limitations

During the qualitative research, limitations were encountered that prevented a broader survey due to the limited number of companies in Lithuania and the refusal of respondents to participate in the survey.

1. Problem Analysis

How Information and Communication Tools Affect Business Processes

Today's technology is an integral part of humanity. The world cannot imagine everyday life without technology, they surround us everywhere: at work, at home, at leisure. Mankind has achieved incredible results by changing our world. A computer, mobile phone, or other smart device are just a few examples of information and communication technology devices. Electronic mail, text messaging, or video calling are information and communication technology applications that allow you to communicate with each other. Although these technologies have become commonplace for us and it goes without saying that they have changed everything fundamentally. Sending a message to another part of the world takes up to one second, having a conversation with anyone remotely has become so easy you just need to have a device and an internet connection. These are benefits that affect each of us personally every day, but they also have a big impact on business. It is easier for businesses to perform their core functions, saving costs and time by using this type and similar technologies. These are just a few examples of information and communication technologies. Information and communication technology in business is one of the most important factors determining business success. Of course, these technologies need to be managed and used. For example, In terms of administration, teamwork and entrepreneurialism are the models to follow. Due to the fact that ubiquitous computing is paving the way for a new stage, we are now focusing on understanding how it may disrupt the way work that is done in businesses. (Cascio, 2016)

Many procedures in business operations that were formerly conducted manually are now automated with the use of information technologies. However, today's information technology is capable of much more. As a result of new technology, the flow of information may be changed, allowing a greater number of individuals to have access to information, replacing consistent phases with activities that can be completed concurrently, and reducing delays in decision making. According to Laudon (2020), the implementation of new information technologies often affects the way things are done in a company operation and enables new business models.

According to a study conducted by Barba-Sánchez (2018), information and communications technologies (ICTs) enable businesses to differentiate themselves from their competitors, reduce costs, capitalize on new business opportunities, increase efficiency and income, and produce consistent results in general. As a consequence, according to the same research, increased industry attractiveness raises the anticipated possibility that a firm would be able to stand out from its rivals and cut expenditures while also taking advantage of new business prospects increasing efficiency and revenue, and generally improving its overall performance as a result of the use of information and communication technology.

One of the studies conducted by the European Union in 2020 reflected in how different technologies are being identified by companies as being (very) important to future competitiveness. Surprisingly, information and communication technology are thought to be significantly less essential for future competitiveness in comparison to their importance in 2019. However, it has to be kept in mind that the data provided in industries such as robotics or big data already reflects and includes information and communication technology.

According to study conducted by Chin (2012), small organizations may increase their competitiveness in overseas markets by using information and communication technology. For the reason that information and communication technology enable Small and medium-sized enterprises to sell their goods to clients outside of their country, they have benefit from this development. In this sense, information and communication technology have importance in their internationalization process because before a product can be sold in a foreign market, it must first be made known to the target markets through the use of the small and medium-sized enterprises technology, such as its website or other tools, before it can be sold in that market.

According to empirical research done by Loukis (2013), there is a positive return on investment in information and communication technology, although there is a considerable degree of variability between different organizations. Such a change is influenced by many factors related to the specifics of the business, the scope of the sector of the organization.

How Collaboration and Information Systems Operate in Business

According to Laudon (2020), a growing body of evidence suggests that businesses' success depends more than ever before on their ability to work together, a belief shared by both the business and academic communities. According to research, expanding cooperation is essential for digitally oriented firms to provide value to their products and services (Kiron, 2017). Worldwide study of business and information systems managers discovered that expenditures in collaboration technology create advantages more than four times of the investment. The largest gains were realized in the areas of sales, marketing, and research and development. (Frost and Sullivan, 2009). According to McKinsey & Company experts, the usage of social technology inside and among organizations has the potential to increase the efficiency with which people engage in range from 20 to 25%, depending on the industry (McKinsey Global Institute, 2012).

Collaboration tools are incredibly strong and in high demand nowadays. Due to the previous circumstances, such as the worldwide COVID-19 pandemic, which forced many of the world's employees to work from home, it is possible that remote work may become more popular in the future. Such job necessitates the use of collaborative technologies. According to Christopher Trueman, principal research analyst at Gartner, During COVID-19, collaboration technologies gained increased attention for their function in guaranteeing the productivity of teams who were abruptly separated by distance. In the future, when many companies switch to telecommuting when employees work in a mixed way, cloud technology and other tools related to work efficiency will become as relevant as non-standard workplaces.

A global Gartner survey reveals that employees are using collaboration tools for work in over 80% of cases in 2021, over half of cases in 2019, and this is a 44% increase since the epidemic started. Also, based on Gartner's survey, as it is shown in Figure 1, collaboration tools have significant increase during past the two years. This information leads us to believe that firms use a variety of collaboration technologies, which highlight how important it is for businesses today to properly adopt and use a variety of collaboration tools including video conferencing software.

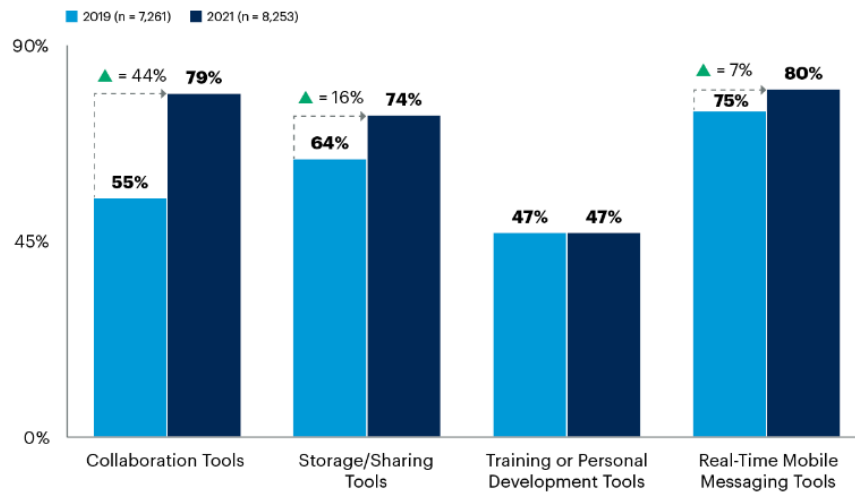


Figure 1 Percentage of respondents changes in the usage of digital workplace technology, 2019-2021 (Gartners, 2021)

According to Khalil (2012), a collaborative, team-oriented culture will not provide advantages if the necessary information technologies are not in place to facilitate communication among team members. Hundreds of tools are available today that are meant to cope with existing reality that, as a result to be successful in employment, companies and people all reliant each another, including coworkers, clients, suppliers, and employees, among other things.

According to Aral and Van (2007), there are several anticipated advantages of collaboration; but, in order to establish meaningful collaboration, it is necessary to have a supportive business firm culture as well as the appropriate business procedures in place. The requirements of collaboration include collaborative capacity, an open culture, a decentralized structure, and the ability to breathe in and out of a collaborative environment. Aral and Van performed a study on the value of cooperation which discovered that collaboration affects global finances - it was found that each word of the e-mail read generates \$ 70 in additional revenue

“Tools for collaboration and social business include e-mail and instant messaging, wikis, virtual meeting systems, virtual worlds, cloud-based file-sharing services, corporate collaboration systems such as Microsoft SharePoint and IBM Notes, and enterprise social networking tools such as Chatter, Yammer, Jive, and IBM Connections” (Laudon, 2020). Author Chichernea (2011) also refers to that there are three main levels of collaboration that should be included in any collaborative application:

- Communication;
- Coordination;
- Cooperation.

Collaboration tools are available at each of these levels, and they are all linked together. First and foremost, communication technologies that facilitate the sharing of information among people. The purpose of coordination tools is to allow users to plan and schedule shared activities with the ability to share information. Finally, technologies for collaboration are intended to allow for real-time group conversations, idea sharing, and the expression of ideas. Figure 2 depicts a graphical overview of the many tools available (Miljanic, 2020)

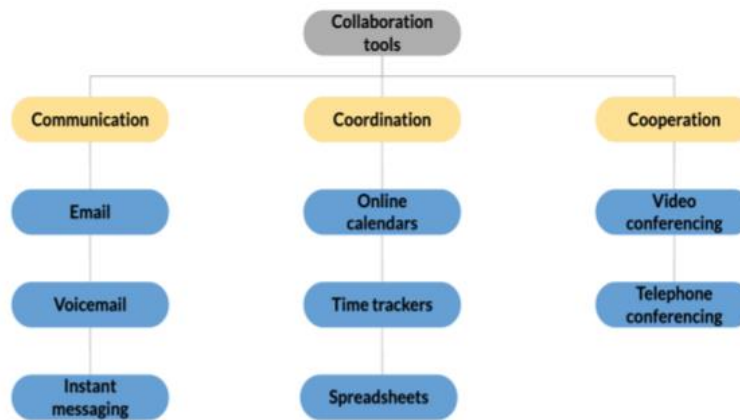


Figure 2 Allocation collaboration tools (Miljanic, 2020)

How Video Communication Affects Business Processes

According to Khalil (2012), virtual meeting solutions are essential for many industries, such as investment banking, accountancy, legal, technology services, and management consulting, where substantial travel is a necessary part of doing business. The expenditures associated with business travel have been progressively growing in recent years, mostly as a result of the rising cost of energy. Many businesses, both big and small, are using video conferencing and web conferencing technology to decrease travel expenditures. Virtual meeting systems are being used by companies such as Heinz, General Electric, and Wachovia for a variety of purposes, including product briefings, training courses, strategy discussions, and even inspiring talks. People can also use telepresence technology, which is an integrated video and audio environment that makes a person look like they're at a place other than where they are. one of the most important features of leading 3 edge high-end video conferencing systems is the ability to record meetings. Management is discussed in depth in the interactive session, which includes telepresence and other technology for holding these "virtual" meetings.

An investigation by Global Workplace Analytics found that allowing employees to work from home 50% of the time may save an average organization \$11,000 per person per year, according to data from a recent poll conducted in the United States of America. Furthermore, if employees were not required to go to work for four days and were instead compelled to work from home, the government would save an estimate of \$32 million. Over the course of many years, research has found that the overall job satisfaction and productivity increases associated with remote work translate into large savings (as in \$277 million per year).

Also, various research and written articles indicate that the literature highlights five main advantages of video communication for business.

- **Video Communication saves time and money.** According to the article, employees who participate in meetings through video chat may save money on transportation expenditures to and from the workplace, which can be significant. Owl Labs found that workers who work from home save up to \$6000 per year as a result of the arrangement. Furthermore, according to the Coworker (2020) Future of Remote Work Report, 50.8% of workers who participated in the poll believe that cost savings are a significant benefit of working from home.

- **Video Communication promotes collaboration and enhances productivity.** The results of a worldwide study of 333 executives conducted by Forbes Insights revealed that 93% of respondents believed that video conferencing technology increases the performance of teams, and 92% agreed that it improves the individual productivity of participants.
- **Video Communication keeps remote teams connected to the company.** Owl Labs also found that when asked whether video conferencing is a beneficial technique for improving the connectivity of distant team members, 96% of respondents said they agreed.
- **Video Communication onboarding new employees.** In order to hire and onboard distant personnel, human resources departments might make use of video conferencing capabilities. Human resource experts are often based in a company's headquarters, which means they may use video conferencing to teach workers who are situated in distant places without incurring travel expenses.
- **Video Communication gives for companies a competitive edge.** Enhanced productivity (42%), increased efficiency (38%), a decrease in bureaucracy and politics (24%), and better documentation and procedure are among the most often reported advantages of remote work by companies (20%), according to the GitLab Remote Work Report 2021. Moreover, video conferencing adds to all of these goals and objectives.

Adoption of Video Conferencing in the Companies

As this work focuses on the development of video conferencing adoption in companies, it is important to review research on how companies integrate such a collaboration tool and what advantages it has according employees. Such a study was conducted and described by Larsen (2015). In this study, the company had only recently introduced video conferencing as a communication tool in the company, replacing old meeting facilities such as phone calls and business travel. The study analyzes how to improve the use of video conferencing in this company, especially in relation to other companies and partners.

The installed video conferencing tool in the company was appreciated by the employees. They see such pluses as a visible reaction of the interlocutors during the conversation, a greater sense of confidence during the conversation, a response to the body language that determines whether the interlocutor wants to speak during the conversation. Also, video conferencing in the presence of many participants during a conversation allows for a better understanding of the interlocutor and a greater flow of information. It is also emphasized that people are more likely to share confidential information. The technological advantages of video conferencing, such as sound quality and the use of an interactive whiteboard, have made it possible to solve problems and understand them better.

As Larsen (2015) analyzes in his work, for these benefits of video conferencing to become a reality, the study found that a number of prerequisites must be met:

- The technology must work smoothly and it must be easy to understand how to use it;
- The technological parameters of video conferencing such as bandwidth, video resolution and sound quality need to be improved to get the best effect.
- Video conferencing equipment must be harmonized everywhere for ease of use;
- Rooms where the video conferencing tool is used must be properly insulated so as not to disturb those around them and to prevent conversations from being heard outside the room.
- The room where conference calls are made should be opaque;

- The video conferencing room must have good lighting;
- Room acoustics were mentioned as an additional factor;
- Video conferencing participants must be able to behave ethically and follow the rules during the meeting;
- Video conferencing participants must be able to use the video conferencing tool and technology.

Also, negative effects of video conferencing that are not only technologically related have been identified in this study. Respondents state that during a meeting, one party may have one-on-one participation in a video conference, but the other party has more than one person in the meeting who uses one video conferencing access. According to the respondents, during such a meeting, a party with more than one person but one access to a video conference meeting feels like not attending a video conference meeting and interacts physically with each other.

As mentioned before, it is recommended to resolve this situation by setting the rules of the meeting and appointing a person (moderator) to ensure compliance. Respondents also pointed out that cultural differences can also have a negative impact on video conferencing. Also, the negatives include the aforementioned lack of knowledge on how to use video conferencing tools. This factor is mainly due to the fact that the meeting is not properly prepared and the time for video conferencing is set up. In this situation, it is indicated that such a challenge can be circumvented by having technical support or maintenance for those responsible for video conferencing.

It was also pointed out that videoconferencing was not easy to use due to its level of complexity. Of course, there are other technical problems associated with this, such as setting audio and video quality settings and other environmental effects.

Finally, the respondent pointed out that the biggest problem is that all the technical issues related to video conferencing and people's ignorance lead to about 80% of the benefits of a video conference meeting. To circumvent such an obstacle, it is proposed to determine the complexity and timing of the topic. It is particularly emphasized that video conferencing is not suitable for negotiations.

Importance of E-learning

Online education is becoming more accessible because to recent technology advancements (McBrien et al. 2009). At any time and from any place, it's common to be able to use a computer linked to the internet. (Cojocariu et al. 2014). Teachers and students involved in education may become more student-centered, inventive, and adaptable with the help of online education. Asynchronous and synchronous learning experiences may take place on various devices (e.g., smartphones, computers, and smartphoness) that have internet connectivity. Using this platform, students have the freedom to study on their own schedules while still interacting with their instructors and other students across the world. (Singh and Thurman 2019).

Live lessons and real-time interactions between professors and students constitute the basis of the synchronous learning platform. While asynchronous learning systems lack structure, they may provide immediate feedback. Instead of being taught in a classroom setting, students now have access to educational materials through a variety of platforms and media. Under such a framework, immediate input and immediate response are not feasible (Littlefield 2018). There are various chances for social interaction in synchronous learning (McBrien et al. 2009).

According to Barboni (2019) during the COVID-19 pandemic and the transformation of teaching into online learning, it is important to consider the following technical features of videoconferencing platforms:

- The Videoconferencing platform must allow at least 40 participants to join at a time;
- There must be an opportunity to talk to pupils or students to make the meeting as realistic as possible;
- There must be good internet quality to avoid disruption;
- Videoconferencing platform must be adapted not only for computers, but also for mobile phones and tablets;
- The videoconferencing platform must be able to record and host recorded lectures. An advantage if it can also accommodate;
- The videoconferencing platform must provide an opportunity for pupils and students to provide feedback and complete tasks using the platform.

Summary

Many procedures in business operations that were formerly conducted manually are now automated. As a result of new technology, the flow of information may be changed, allowing a greater number of individuals to have access to information. Information and communication technologies enable businesses to reduce costs, capitalize on new business opportunities, increase efficiency and income. According to study conducted by Chin (2012), small organizations may increase their competitiveness in overseas markets. Information and communication technology enable Small and medium-sized enterprises to sell their goods abroad.

Collaboration tools are incredibly strong and in high demand nowadays. According to McKinsey & Company, the usage of social technology inside and among organizations has the potential to increase efficiency with which people engage in range from 20 to 25%, depending on the industry (McKinsey Global Institute, 2012).

Video conferencing in a meeting allows for a better understanding of the interlocutor. It also makes it possible to solve problems and understand them better. There are a number of prerequisites that must be met for these benefits to become a reality, says Larsen (2015). Video conferencing is not easy to use due to its level of complexity. Cultural differences can also have a negative impact on videoconferencing. Technical issues and people's ignorance lead to about 80% of the benefits of a video conference meeting, respondents say.

Teachers and students involved in education may become more student-centered, inventive, and adaptable with the help of online education. Asynchronous and synchronous learning experiences may take place on various devices (e.g., smartphones, computers, and tablets) using a videoconferencing platform.

2. Theoretical Solutions of Overcoming Challenges to Adoption of Video Conferencing Technologies in Small and Medium-Sized Enterprises Theoretical Solutions

2.1. The Importance of Small and Medium-Sized Enterprises

Businesses of all sizes, including small and medium-sized enterprises, are vital to a country's economic, technological, and social growth. It has a significant role in the worldwide economy because of its important contribution to the gross domestic product and its role in raising the living standards of the general public throughout the globe. In general, advanced countries have 90% of the firms in the Small and medium-sized enterprises sector, which is one of the most significant causes for financial growth in these countries. The current segment of Small and medium-sized enterprises plays an essential role in the global economy via the distribution of home commodities to various countries across the globe (A. Zafar, 2018).

In this work, it is useful to know how a small and medium-sized enterprise is described. Gibson and Vaart (2008) describe how different institutions describe small and medium-sized enterprises. The World Bank says Small and medium-sized enterprises must have up to 300 employees and up to 15 million annual revenues. The Multilateral Investment Fund (MIF), meanwhile, says a small or medium-sized business must have up to 100 employees and up to 3 million in annual revenue. The vaguest criteria are provided by the African Development Bank and the United Nations Development Program, which state that an small and medium-sized enterprises must have up to 50 and up to 200 employees (Figure 3).

Institution	Maximum # of Employees	Max. Revenues or Turnover (\$)	Maximum Assets (\$)
World Bank	300	15,000,000	15,000,000
MIF – IADB	100	3,000,000	(none)
African Development Bank	50	(none)	(none)
Asian Development Bank	No official definition. Uses only definitions of individual national governments.		
UNDP	200	(none)	(none)

Figure 3 Definition of small and medium-sized enterprises by other organizations (Gibson and Vaart, 2008)

According to the European Commission's "User Guide to the small and medium-sized enterprise Definition" (2020), small and medium"-sized enterprises in European Union can be divided into three parts (Figure 4):

- **“Micro-enterprises** refer to businesses with less than 10 employees and annual revenue or balance sheet total of less than EUR 2 million.
- **Small enterprises** refer to businesses with less 50 employees and an annual revenue or balance sheet total of less than EUR 10 million.
- **Medium-sized enterprise** refers to businesses with less than 250 employees and either a annual revenue of less than EUR 50 million or a yearly balance sheet of less than EUR 43 million.”

Company category	Staff headcount	Turnover	or	Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

Figure 4 Factors of small and medium enterprises (European Commission, 2020)

2.1.1. Small and Medium-Sized Enterprises Impact on the Economy

Small organizations are the engines of economic development and innovation. Figure 5 by V. Kotelnikov (2007) depicts the behavior of both reinforcing forces. The total number of Small and medium-sized enterprises in the economy is determined by the rate at which new Small and medium-sized enterprises are created and the rate at which existing Small and medium-sized enterprises are liquidated. The formation of new Small and medium-sized enterprises is accelerated when profitable market possibilities are available. This raises the overall number of small organizations within country, which in turn promotes employment generation and income per capita. With increasing income, individuals will consume more, which will open up new market prospects that will encourage the establishment of more Small and medium-sized enterprises in the process. In contrast to international organizations, the expansion of small organizations is having a positive impact on the country since the vast majority of Small and medium-sized enterprises are owned and operated by local companies. Economic growth is a result of this self-reinforcing process.

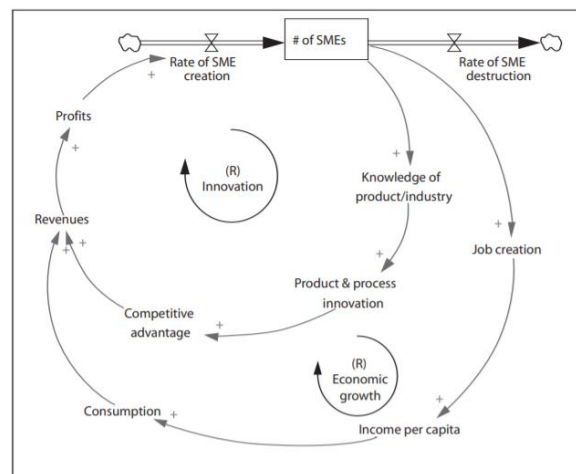


Figure 5 Small and medium-sized enterprises as a Driver of Economic Growth and Innovation (V. Kotelnikov, 2007)

Economic growth is also stimulated by the self-reinforcing loop of innovation. In proportion to the rise in the number of Small and medium-sized enterprises, their understanding of their product and sector grows. Their expertise enables them to come up with new ideas for the product or process that in turn allows them to gain a competitive advantage and earn more revenue. The profitability of Small and medium-sized enterprises will motivate more individuals to set up their own businesses to be able to benefit from the market potential once again. Furthermore, the growth of Small and medium-sized enterprises may contribute to the achievement of other development objectives. Small and medium-sized enterprises may either supply products and services in sectors vital to development, such as health and education, or serve as a source of income for those who are disadvantaged. For example,

initiatives to create female entrepreneurs contribute to greater gender equality by providing women with a source of income. (V. Kotelnikov, 2007)

2.1.2. Technology as One of the Most Important Factors for the Growth of Small and Medium-Sized Enterprises

According to Levy (2005) an essential attribute of small and medium-sized organizations is the ability to respond flexibly and quickly to market situations. In both emerging and established countries, there is a great deal of demand on businesses to be more flexible these days. Companies are subjected to external factors such as a changing market and technological progress that occurs at breakneck speed.

To properly describe firm growth and determine how growth is assessed, according to Davidsson, Delmar, and Gartner (2006), it is vital to first define what constitutes growth. Growth is measured by a variety of measures, and there does not seem to be a single, universally applicable measurement. “Indicators such as sales or turnover growth and employment growth over a period of time are commonly used. Other indicators such as asset value, market share, profit and production level are also used to measure development but are not very common compared to sales and employment.” (Govori, 2020) Indicators such as sales and employment are the most commonly utilized. Production and market share vary widely between sectors, making it difficult to compare them.

Total assets are also dependent on the industry's capital intensity, which fluctuates over time, and earnings are not very significant until comparing the size of a company. As a consequence of this, revenue and employment are the two most essential factors for determining the size and development of a company. Employment figures are also a statistic that is widely available, since they are a critical figure for government officials in many countries. For their part, sales data are impacted by inflation and currency rates, making it impossible to compare sales figures across different sectors. It is for this reason that it is critical to examine business development using a variety of growth indicators (Davidsson, Delmar & Gartner 2006).

A lot of different authors and scholars have described and identified external elements that have a big influence on the growth and development of small organizations.

Finance – if you want to establish your own firm, Guffey (2008) states that, you need to have a good business action strategy in place. To get financial support, you will need a bank loan or venture capital from investors unless you can rely on the bank accounts of your family. Securing financial backing requires the development of a business strategy. Also, it is important for a start-up entrepreneur to have working capital for things like renting premises, equipment, and so on. It is important to mention that, the ability to fund a company is critical, and obtaining access to capital is critical to the development of a company's operations. Most creditors find it almost hard to analyze the risks associated with a particular investment, mostly due to the high degree of unpredictability in the market.

Competition – As a consequence of globalization and greater commerce, developing nations are forced to compete with developed countries; nonetheless, trade barriers and other limitations tend to benefit developing countries (Lind, 2009). As a consequence of the Free Trade Agreements, worldwide businesses are becoming more competitive (small and medium-sized enterprises, 2008). With the help of the World Bank, an investigation on Small and medium-sized enterprises conducted.

In accordance with the conclusions of the study, competition poses a threat to the viability of individual businesses. However, although competition poses a significant danger, it is precisely this pressure on businesses to increase their efficiency that leads to their expansion and development.

Globalization – the rising internationalization of companies and management may be the most major cause of change now affecting many enterprises. This arises as a result of businesses' efforts to keep expenses under control, particularly labor expenditures. Of course, responding to competition is another factor driving the expansion of multinational corporations. Griffin and Moorhead (2009) describe the process as follows: small organizations that are globally engaged expand on average quicker than their local counterparts. Small organizations are under increased pressure to adopt environmental plans in order to stay competitive. Many small organizations lack the essential resources to tackle the worldwide challenge of internationalization.

Entrepreneurship, according to M. Lévy (2005), is defined by a mix of factors including the business creator vision, approach, and organizational structure. A number of major impacts on Small and medium-sized enterprises development were also identified by the author, including internal aspects that indicate how actions and characteristics affect the success of a company.

Importance of the owner - according to Macpherson and Holt (2007), the management expertise of a company is critical to its development. Thassanabanjong (2009) wrote that investing in staff training is critical for increasing production and performance, also as enhancing workers' productivity and ambition to work. In order to take part in the procedure for making decisions throughout the organization, the small and medium-sized enterprises owner has significant personal influence on the plans, tactics, and operations of the company.

Employees - Gummesson (2000) described the importance of employees in Small and medium-sized enterprises and other types of companies because they create added value, but Small and medium-sized enterprises do not want to hire a good specialist or workforce to grow because of their limited resources and experience, because they do not want or cannot afford to additional funding. Small organizations must guarantee organization can recruit, keep, and inspire a high level of excellence personnel who possess productive transferrable skills by establishing a coaching strategy and allocating a specified expenditure plan for coaching.

Marketing – according to Brush (2009), another challenge for Small and medium-sized enterprises is marketing. Marketing faces complex processes such as refining distribution channels, properly presenting product features, setting the right pricing, and trying to implement marketing as effectively as possible to attract customers and increase sales.

Innovation – it is one of the most important roles in the development, growth and success of Small and medium-sized enterprises. This is one of the key characteristics of success. According to Levy and Powell (2005), an innovative company will always adapt to the customer and will be able to offer exclusive solutions tailored to the customer's niche or non-standard activities.

Technology – small and medium-sized enterprises often have poor performance and are not as competitive as others, which is the consequence of utilizing ineffective technology, not improving the usefulness of equipment, and not developing in technology owing to a lack of finance, and the majority of Small and medium-sized enterprises are primarily consumers of technology rather than adaptors of technology (small and medium-sized enterprises, 2008). Also, According to the World

Bank (2009), It is necessary to buy new machines and other types of equipment in order to obtain more products and achieve better results in general. In this way, better and more efficient results can be achieved with which the company can generate higher income, thus creating value and gaining competitiveness among other companies.

Based on the analyzed theoretical aspects, which determine which factors have the greatest impact on the growth and development of Small and medium-sized enterprises, it is important to emphasize that the growth of Small and medium-sized enterprises is also influenced by the technological factor, which includes information technology, which includes many components, including information and communication technology.

Small and medium-sized businesses utilize information and communication technology to expand and become creative, to increase both technical and management experience, and to provide web-based solutions for business (Apulu & Ige, 2011). Businesses may reap the benefits of employing information and communication technology to boost production or improve contact with consumers in order to expand their client base. The adoption of information and communication technology is influenced by the form of operational investment that emphasizes cost and efficiency. What matters is that information and communication technology use begins with the basics, such as telephones and computer software that analyze documents. It then advances to the more complex, such as email, e-commerce, and programs that process information.

Business growth may be achieved via the use of technology, according to Matthews (2007a). A few of the most important facets of business that information and communication technology has the ability to improve include marketing, communication, networking, and resource allocation. Websites, e-mails, and phone calls all contribute to better service and a larger consumer base. Websites are fantastic resources for gaining access to new audiences.

As knowledge integrators, small and medium-sized businesses that make good use of information and communications technology may prosper. Using information and communication technology in small businesses increases profitability and enables them to expand their customer base. These companies are positioned for wholesale growth in a strategic manner. The usage of email to connect with clients increases revenue by 3.4%, according to Matthews (2007). In addition, a research in Canada found that production and investment are greater in companies that use information and communication technology. E-commerce, on the other hand, accounts for 4% of sales growth and 5% of export performance.

According to Olise et al (2014), information and communications technology aids in the collection, processing, and transmission of electronic data. Radio, television, and print media are some of the most often used information and communication technology in underdeveloped nations. Information and communication technology such as software, the Internet, fax machines, emails, and cell phones provide contemporary and efficient methods of exchanging knowledge and information. Microbusinesses may stay small and successful by using information and communications technology to its full potential (Alam & Noor, 2009). Small and medium-sized enterprises benefit greatly from the Internet in terms of worldwide sales and, as a result, their long-term development. Small and medium-sized enterprises know that computers, email, and the Internet are essential tools for their operations. It is possible that the use of information and communication technology will lower costs and boost output. Information and communication technology is also credited by Alam

and Noor (2009) with improving customer and supplier interactions, effective and efficient marketing, the development of better products/services and greater access to information/teaching.

The use of information and communications technology by small and medium-sized businesses improves their competitiveness, opens up new markets, facilitates communication with suppliers and consumers, and provides useful data to the general public (Boohene et al., 2015). Indirect and direct costs are reduced through information and communications technology, which improves business performance. Indirect cost reductions include, for example, a reduction in operating costs and an improvement in production. Direct costs, on the other hand, may involve a decrease in the input of the company. There has been a rise in sales volume due to the usage of communication technologies. There has also been an increase in market share.

Computers, Internet connection, and online presence, according to Boohene et al. (2015), contribute to improved sales, enhanced productivity, market share, and high profit levels for small and medium-sized enterprises. Even though information and communications technology has been shown to save costs and enhance fundamental business operations, Apulu and Latham (2010) stress the importance of using information and communications technology in small and medium-sized enterprises.. Small and medium-sized businesses may gain a competitive edge via the effective use of information and communications technology.

2.2. Information and communication technology Adoption in Small and Medium-Sized Enterprises

Role of Information and Communication Technology in Small Medium-Sized Business

Information and communication technology (ICTs) are more than simply computers. The study of technology's impacts on the economy and business disciplines must be taken into consideration as well, despite a recent trend toward a greater emphasis on Internet technology research. Today, information and communications technologies (ICTs) must be thought broadly to include both the information that organizations produce and utilize, as well as the vast array of more convergent and connected technologies that process that information. "Therefore, ICTs can be viewed as a collective term for a wide range of software, hardware, telecommunications and information management techniques, applications and devices, and are used to create, produce, analyses, process, package, distribute, receive, retrieve, store and transform information" (Sanchez, 2007).

Today, the growing use of information and communications technologies (ICTs) is transforming the way individuals and businesses conduct their business. It is a characteristic of technical breakthroughs during this time in history that there has been tremendous innovation in information management and communication, as a result of which information and knowledge are readily transferred, accessed, and utilized in many nations. As a result, the rate of technological progress, as well as the tools and resources accessible to businesses, has transformed how they engage and do business. According to Sanchez (2007).

Information and communication technology, in particular, offer a significant potential for supporting small and medium sized enterprises in improving their businesses via more effective usage and integration of information and communication technology in business operations, as well as assisting them in making more efficient choices that are important to their performance. Information and

communication technology have the ability to transform Small and medium-sized enterprises by making them more competitive, inventive, and growth oriented.

Information and communication technology have a major impact on small and medium-sized enterprises and also play an important role in the economy and its growth. Information and communication technology can help manage resources, reduce costs, help develop international relations, and provide access to limitless information (Hoque, 2015). According to Lee (2010), by enabling new business models that incorporate information and communication technology, small and medium-sized enterprises can easily enter new markets and have a benefit over their competitors. Without the implementation of information and communication technology and technological improvements, small businesses may lag behind their competitors and their customers may be left behind with negative consequences.

Implementation of Information and communication technology in Small Organizations

After analyzing the scientific literature and various authors, it was found that the empowerment of information and communication technology in small and medium-sized enterprises can be divided into three groups (Figure 6):

- employment of information and communication technology in the company;
- factors influencing the implementation of information and communication technology;
- variables which are used to determine the level of information and communication technology assimilation in small and medium - sized enterprises.

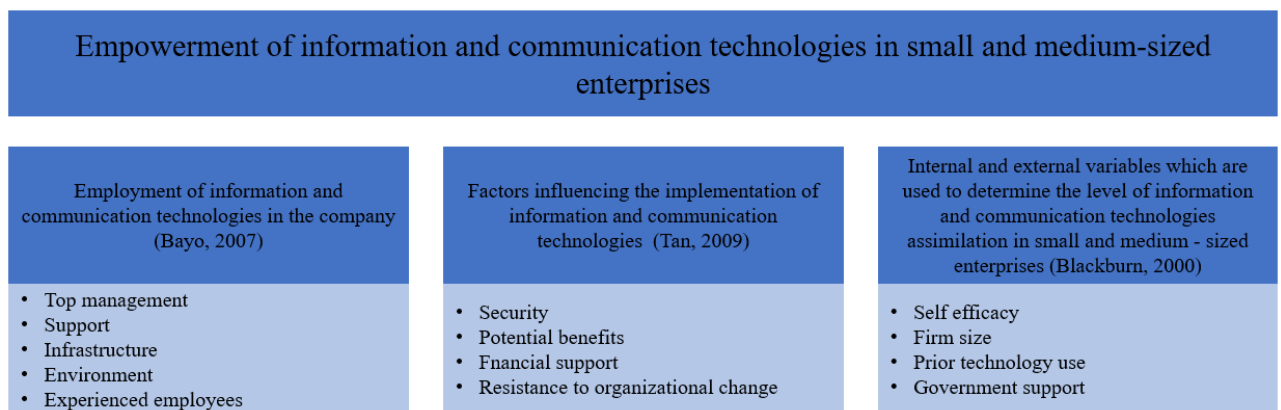


Figure 6 Three groups of information and communication empowerment in small sized enterprises

It's crucial to remember that the advantages of implementing information and communication systems, aspects, and tactics should balance the expenditures of implementation and supervision. As a result, business concerns and prospective profits must push adoption. After a given degree of information and communication technology acceptance and dispersion, not all small and medium sized organizations will inevitably catch up with big enterprises since information and communication technology may not provide significant advantages, and small and medium sized organizations may continue to employ conventional business methods. Maintenance of networks, their architecture, help centers, the cost of support services are just some of the factors that need to be taken into account when implementing information and communication technology (Leenders, 2002).

Based upon those concerns, certain critical components for a successful implementation of information and communication technology-based solutions in small organizations might be identified (Figure 7). To begin, it is strongly advised that information and communication technology-based solutions be implemented slowly in small organizations, since rapid changes risk failing versus unprepared and ignorant businesses. Second, proper training and assistance are essential. One of the biggest challenges for small organizations in realizing information and communication technology possibilities is a poor understanding of the advantages that may be obtained, along with little or no formal instruction on information and communication technology. Because most small businesses do not use information technology for their operations, this issue becomes more acute as the company becomes smaller. As a result, a number of issues must be addressed in order to make information and communication technology more user-friendly, dependable, and well-integrated into small organizations operations (Sanchez, 2007).

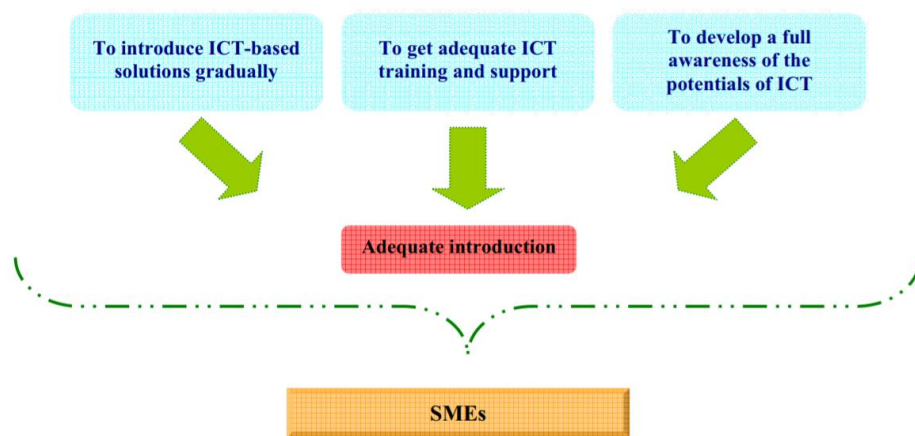


Figure 7 Factors determining the proper implementation of technology in small organization

Continuous education in information and communication technology has a major impact on raising people's awareness of the importance of these technologies. Continuous employee training can allow company management to understand that knowledge of technology in the company is important and can understand the potential of the technology itself (Brady, 2002). It is important to raise awareness of the applicability and importance of information and communication technology themselves. For these reasons, many companies have failed to implement information and communication technology, precisely because of the lack of awareness of the importance and benefits of technology.

Informing about the benefits should start with talking about short-term perspectives and how technology helps to solve day-to-day issues quickly, and once you become established, you should be educated about the benefits of long-term technology. When implementing information and communication technology in small organizations, it is necessary to take into account who the head of the company is and whether they are prone to innovation (Sanchez, 2007).

The author Ongori (2010) analyzed the factors and other elements that hinder small and medium-sized enterprises to assimilate information and communication technology and their advantages. The author has developed a concept that would facilitate the understanding of the benefits of information and communication technology (Figure 8). This model is based on four elements:

- necessity of implementation information and communication technology;
- benefits of implementation information and communication technology;
- barriers of implementation information and communication technology;
- implementation instruments of information and communication technology;

According to Ongori (2010), the changing nature of technology, globalization, rivalry, market opportunities, and the personal considerations of small and medium-sized enterprises owner managers are all driving factors in the industry. These factors drive company owners and managers to incorporate information and communications technology into their operations. Even in the face of these motivating factors, however, small and medium-sized enterprises have struggled to properly integrate information and communications technologies into their business operations.

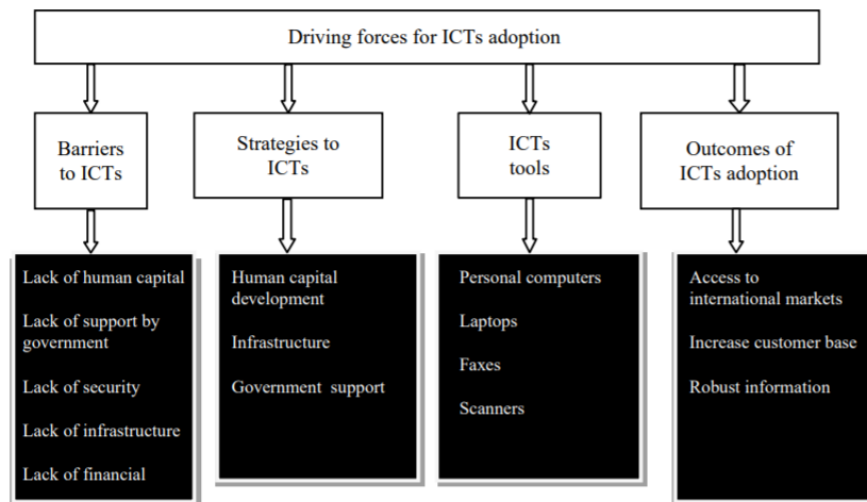


Figure 8 Information and communication technology adoption (Ongori, 2010)

Factors that have hindered the implementation of information and communication technology include a lack of knowledge about applications, a lack of software architecture, limited knowledge of information systems, changing network costs, and a lack of security. While these factors limit the implementation of information and communication technology, managers in small organizations need to implement strategies that limit the occurrence of problems. Human capital development is one of the measures being used. This will be accomplished with the cooperation of other parties involved, such as the government. The government could implemented the structure and create regulations to encourage the use of information and communications technologies by small organizations (Ongori, 2010).

Furthermore, non-governmental institutions will support small and medium-sized enterprises in obtaining finance for the purchase of information and communications technology instruments and the development of their human resources. Implementation in small organizations will increase their customer support, coordination of communication, stock management, potential for foreign markets, effective resource management, and administrative efficiency despite the aforementioned limiting factors. Failure to include information and communication tools into their company processes, however, would result in small organizations being denied access to worldwide markets, receiving insufficient and reliable information, failing to manage resources effectively, and resulting in a lack of efficiency in administration (Ongori, 2010).

Benefits of the Use of ICT in Small and medium-sized enterprises

Information and communication technology can offer many positives in business processes and communication between companies. These technologies can improve the dissemination of information, reduce costs, and increase the efficiency of tasks. Such measures also lead to better quality in customer communication and substantially better communication. Small businesses that use information and communication technology can gain benefits such as: improve the efficiency of tasks or functions, encourage innovative organizational, strategic, and management concepts to be implemented, access to new markets and business niches, influence the productivity of human resources by improving their competence and specialty (Cela, 2005).

According to Ongori (2010), in today's business environment, information and communications technologies help businesses to become more competitive. Information and communication technology have a significant impact on knowledge control, access to quality information related to organizations, faster and higher quality administration, greater access to new markets and the development of small organizations. As seen in Figure 9, information and communications technologies also lead to efficient and productive administration of organizational resources.

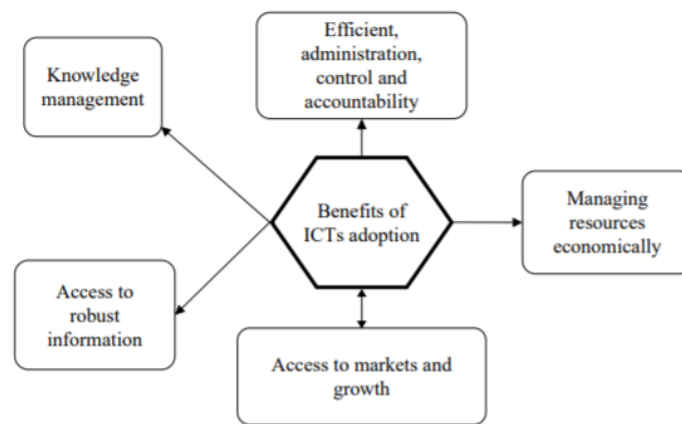


Figure 9 Advantages of information and communication technology implementation (Ongori, 2010)

According to Lukacs (2005), the implementation of information and communication technology improves the management of information in the organization, reduces costs, improves the efficiency of business-to-business and business-to-customer transactions. Also, information and communication technology allow to increase the quality of communication and services provided to various types of customers. Information and communication technology help small organizations to gain access to comprehensive corporate information that improves the overall performance of the firm (Irani, 2002). In today's business climate, these instruments are no longer considered a technical "service," but rather an essential resource for Small and medium-sized enterprises looking to improve their competitiveness in any industry (Kohli, 2004).

The use of information and communications technologies is critical for the effective management of small organizations as well as the execution of best services. Information and communications technology technologies allow data to be digitally stored, viewed, distributed, and retrieved for use in decision-making processes inside the company. It has been said that most small organizations across the globe are progressively using information and communication technology tools to improve

their e-readiness status in order to find, collect, manage, communicate, and utilize information to make educated decisions. Furthermore, information and communication technology play an important part in the improvement of accountability systems in corporate businesses (Carlos, 2007)

2.3. Video Conferencing Adoption Benefits and Challenges

2.3.1. Video Conferencing Classification

Before delving into the advantages, disadvantages, and challenges of video conferencing, it is useful to find out more about video conferencing and how it is classified. Videoconference technology is a kind of communications channel that enables people to exchange video and audio resources in real time while they are connected. Moreover, it enables authorized user to send files, presentations, static pictures, and text via the system that is currently being utilized by the company (Krutka, 2016).

Computing, high-speed networking, and high-bandwidth video conferencing tools have become increasingly relevant in many organizations, including businesses, schools, hospitals, and universities, among others, because of technological advancements in many countries, particularly developing countries. Nevertheless, though with a strong network, the use of some video conferencing technologies may result in a variety of distinct experiences depending on the purpose of the meeting and the surrounding environment (Al-Samarraie, H., 2019).

The relationships between students, coworker and other related individuals in videoconferencing contexts, has created new potential for improving the delivery of conventional business development and pedagogies (Campbell, 2006). Managers, educators and other employees implement video conferencing in their work environment not only to make it more convenient, but also to apply innovative work environment solutions. However, according to Lewis (2016), video conferencing may not always have a beneficial influence on the company's working atmosphere, it may have a negative impact on achieving results.

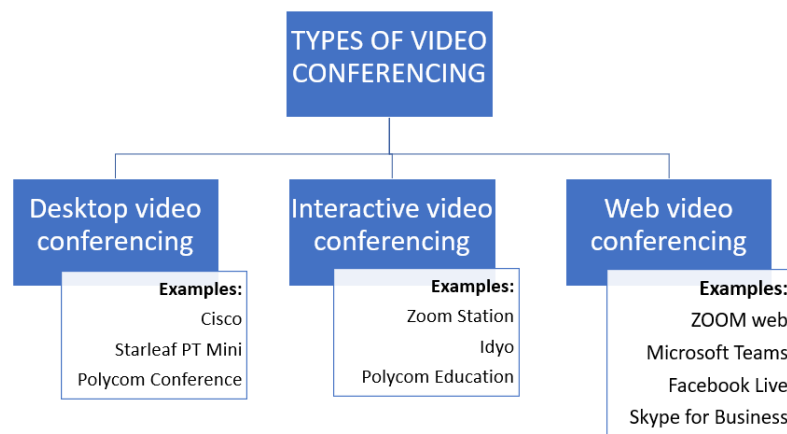


Figure 10 Types of video conferencing (Al-Samarraie, H., 2019)

In Figure 10, a kind of videoconferencing called desktop video conferencing provides a group of individuals with numerous channels of communication in order to talk about relevant subjects and to solve specific problems. In addition to many-to-many and one-to-many forms of interaction, desktop video conferencing also supports a number of other modes of interaction such as many to one and

one to many. Additionally, it offers a distinct benefit to organization employees enabling them to participate in debate that modified computers or systems that can be set up and used in their own personal computers.

Interactive Video Conferencing, which is also illustrated in Figure 6, is a sort of video conferencing that needs stable environmental settings as well as complex setup in order to sustain the interaction between participants throughout the meeting. This sort of service facilitates one-to-many engagement, in which the presenter provides their information to the audience in real time, rather than across the internet. The system is well suited for holding meetings and training sessions in remote places. Meetings facilitated via Interactive Video Conferencing are often supplemented with multimedia components to make it easier for participants to absorb the information.

Using Web-based meetings (which use interaction modes similar to desktop video conferencing), presenters and other participants from different locations can attend in Web-based meetings. Unlike desktop video conferencing and interactive video conferencing solutions, the primary benefit of web-based video conference is that it requires no special hardware and/or software restrictions, while desktop video conferencing and interactive video conferencing solutions do.

All three types of tools are widely used in problem solving and communication or other types of meetings. However, the current literature does not specify the effects of individual types of video conferencing and how they differ. The study by Al-Samarraie, H. (2019) reflects the main differences between the three separate types of video conferencing in terms of technical and organizational perspectives (Figure 11).

Characteristics	Desktop Video Conferencing	Interactive Video Conferencing	Web Video Conferencing
Requires advanced hardware configuration.	X	X	
Requires advanced software configuration.	X	X	
Cost effectiveness.		X	X
Requires Internet connection	X	X	X
Requires account.		X	X
Allows file sharing	X	X	X
Enables presentation.	X	X	X
Provides private access.	X	X	
Provides public access.			X
Requires permission to access.	X	X	
Provides advanced multimedia support.			X
Requires advanced proxy configuration.	X	X	
Requires training.	X	X	
Supports one-to-many interaction.	X		X
Supports many-to-many interaction	X		X
Supports one-to-one interaction.	X		X

Figure 11 Desktop, interactive and web video conferencing comparison (Al-Samarraie, H., 2019)

Video Conferencing Nowadays

According to Lopez (2015), users have access to a variety of video conferencing programs, ranging from the built-in FaceTime feature on our phones and Microsoft's Skype to more recently developed software such as Zoom or Microsoft Teams. FaceTime and Facebook video calling will be known to a large number of individuals, including students. Both services make it simple, fast, and quick to make video and voice calls. For FaceTime, a user just has to ensure that the person being contacted has an Apple ID and that the Facetime software has previously been downloaded onto an Apple device before initiating the connection.

According to Henshall (2017) to communicate with another person via “Facebook” is possible only if the person you want to contact with also has “Facebook” or “Messenger” apps. Although these programs are often running smoothly, they are highly adaptable to simple everyday communication rather than a professional environment. Additionally, a person's Facebook profile and Apple ID are private, and their usage may result in difficulties. In addition, both apps have very restricted functionality and capabilities. In professional environment the adoption of “Facebook video calling” or “Facetime” would be for a invited speaker in which individuals are not actively managing the program in order to avoid mistakes.

“Skype”, “Google Hangouts”, and “Zoom” are examples of more professional video conferencing systems that provide a wider range of tasks and capabilities. These services provide the opportunity to quickly share the screen and talk with other users at the same time as the user is video chatting. Google Hangouts offers greater control over which parts of the screen are shared, while Zoom and Skype share the full screen by default. Google Hangouts offers greater control over which parts of the screen are shared, while Zoom and Skype share the full screen by default. Group chat is available in all three apps as well. Skype and Google Hangouts enable up to 25 individuals to participate in a free conversation, while Zoom enables up to 50 people to participate in a free conference but restricts the conference to 40 minutes. Both Skype and Zoom have subscription versions that provide more features and functionality (Henshall, 2017).

A user generates a URL that serves as a meeting room; the URL may then be shared with anybody who wants to participate in the meeting without having to log in. Zoom offers the best video and audio quality, although the difference is negligible compared to other options. If the majority of the people involved in a collaboration already have and are acquainted with one of the software solutions, any of them will be sufficient if the internet connection is fast enough. As a result of its higher quality and low resource consumption, Zoom outperforms both Google Hangouts and Skype in two critical categories for video conferencing users: video quality and computer resource use.

2.3.2. Video Conferencing Adoption Benefits

Because of the many advantages connected with video conferencing technology, the majority of enterprises throughout the world have embraced this idea. Organizations who have used it in their processes have seen a significant increase in their competitive advantages.

Authors Arnold and Clayey (2006) performed a research in which they looked at 10 different scenarios in which video conferencing programs were used. According to the findings of this study, video conferencing has a number of beneficial effects, including increased collaboration among schools, increased learning opportunities, increased participation of experts in classroom learning,

increased networking, and teachers' ability to deepen their knowledge more easily and effectively. The majority of those who took part in the study were favorable about the benefits of video conferencing.

In addition, another research was carried out to determine the cost-effectiveness of video conferencing. In distant rural schools, a video conferencing software was placed on pupils' personal computers, which allowed them to communicate with their teachers. They evaluated the findings at the end of the year and came to the conclusion that video conferencing training is a cost-effective option. It is worth emphasizing that video conferencing is not only cost-effective, but also produces positive effects in terms of student performance (Hepburn and McMillan, 2008).

In his study, Hartvigsen (2007) discovered that video conferencing offers a number of benefits in the medical field. Following the lead of Norway's pioneering medical telemedicine program, as well as the research conducted in Canada, research has revealed that video conferencing provides benefits such as reduced number of visits to medical facilities (reduced travel), reduces waiting time for a doctor's visit, and there is a greater choice of specialists. According to research conducted by Detweiler (2011), patients who use video conferencing technology report feeling more engaged in the treatment process and having higher decision-making authority. According to many studies, the most significant benefit of video conferencing is that it allows patients to have more convenient access to treatment facilities and to their medicine expert.

There has been a lot of research done on video conferencing in the medical field, which points to these main reasons why video conferencing tools are useful in the medical field. These studies have pointed to benefits such as doctors being able to provide longer consultation to patients, as well as the doctor being able to devote more time to other tasks, visiting more patients per day, making diagnoses faster, and more accessible to experts (Cruz, 2005). It has been suggested by Simms and others that the use of Video Conferencing does not impair successful patient-provider contact and therapeutic relationship development (Richardson, 2009).

These and similar studies provide insights into the benefits of video conferencing in a variety of organizations as well as in business. It is argued that video conferencing can increase efficiency in organizations by saving time on factors such as travel time, and so on. However, the positive aspects are seen not only by the organization but also by the individuals who face it: students, doctors or clients.

2.3.3. Video Conferencing Adoption Challenges

Understanding Video Conferencing Ease

According to David (2009), a person's perception of the ease of use of technology can be defined as the degrees to which an individual agrees to use the system without effort. Once an individual understands what a technology means and how to use it, he or she will be able to adapt and use it easily, but many people find technology to be a complex mechanism and difficult to use, making it slow and difficult to adapt.

When it comes to recognizing the simplicity of the new system, altitude is one of the most important factors to consider. Several studies have shown that, among other considerations, simplicity of use is a critical factor in determining IT choices (Beiginia, 2007). According to Pam (2002), research aims

to portray how individuals adopt web technologies using a technology adoption model that reveals that the ease of application and use of technology and the known value it provides have a strong power to choose whether or not to use technology.

Understanding Video Conferencing Utility

According to David (2009), perceived utility is when an individual is convinced that enabling the appropriate technology will improve an individual's job performance. David (2009) went on to explain that perceived usefulness has a strong relationship with user adoption of information technology, and that the correlation between perceived usefulness and behavioral intention varies among nations. Although the research on online retailing from the Technology acceptance Model is restricted, the comprehensible utility construct has received a great deal of support from a wide range of different technological applications, which has verified the construct of perceived usefulness (Koufaris, 2008).

Challenges of Video Conferencing Implementation

According to Parker and Castleman (2007), There is a continuous discussion concerning the usefulness of information and communications technology (ICT) to Small and medium-sized enterprises, both inside and beyond the educational institutions, despite contradicting evidence for the relevance of the variables influencing ICT adoption and usage. Earlier research on ICT adoption have found that small organizations in some country not enough invested in technological development to expand their businesses. A greater knowledge of ICT use is required as are variables that drive or hinder its acceptance and use as discovered by Harindranath (2008).

However, according to Gough (2009), although new ICT technologies allow individuals to experience a personalized relationship with the interlocutor during a conversation, it will not be the same as live encounter in real life. Live meetings in real life are needed for people to have deeper, more meaningful and stronger relationships.

According to a research conducted by Walczuc (2010), the most significant barrier to Internet adoption and the development of an online presence is the fear that the Internet would not lead to increased efficiency or even a reduction in costs. Another significant impediment highlighted is the belief that the Internet is unsuitable for a certain kind of business. In summary, if businesses fail to see the importance of having an Internet connection, they will remain passive in their use of Internet-based technology. Apart from that, some businesses, just by virtue of their nature of operation, are not well suited to having an Internet connection.

Alam (2009) examined the elements of compatibility and cost of implementation across Malaysian Small and medium-sized enterprises in his research on Internet implementation among the latter. As long as organizations have appropriate infrastructure for implementation and it is consistent with their business processes, the implementation and use of web technologies is often high. This is because firms are not needed to invest a big number of money in infrastructures (Bazar and Boalch, 2007). As Gattiker (2006) wrote, it has been determined that the cost of implementation may be separated into two categories: Internet connection costs, and firm revenue. An organization's likelihood of adopting a new invention increases as the cost of adoption decreases and the revenue of the organization increases.

According to Frost (2006), with the advent of new technologies and improvements in the old ones, companies have replaced the old Integrated System Digital Network with a new Internet Protocol (IP) network that provides better network access and IP has a substantially better network architecture. Within the Internet Protocol platform, factors such as sound, video, and other information work simultaneously. Typically, this means regulating the transmission rate that may be used for each video conference. Some users have taken a long time to switch to newer, faster technologies. This is due to factors such as distrust of new technologies.

Current findings have shown that travel agencies have failed to keep up with customer demand since firms have not fully adopted internet trends and technologies (Formica, 2008). Generally speaking, there seems to be widespread consensus that the travel agencies and all tourism sector adoption of new technologies or their upgrades is lacking and does not match the standards necessary to compete in an increasingly information and communications technology (ICT) driven market. Schegg (2008) and other researchers have done research to describe how web technology is being adopted in tourism sector. They have found that new players in the tourism sector are adopting and taking web technology for granted, while the traditional tourism sector is not so fast embracing web technology.

Company internal policy, hierarchy, and standardization are some of the problems that larger companies face while integrating new technology (Evans, 2006). According to Nodder (2008) the limited knowledge of the advantages and importance of technology among small organizations the lack of a strategic vision for information and communications technology, and a poor training and funding are all common impediments to technological adoption.

Small and medium-sized enterprises adoption and usage of information and communication technology such as videoconferencing is fraught with difficulties. In both industrialized and developing nations, small and medium-sized businesses face a similar set of issues. A lack of information technology skills, insufficient information and communication technology integration procedures by firms and pricey information and communication technology equipment are only some of the most typical and often mentioned difficulties (Sin Tan et al., 2010). Low adoption of information and communication technology is mostly due to technical obstacles imposed by unskilled workers, including a failure to recognize the importance of information and communication technology and their positive return on investment (ROI) (Agboh, 2015). Other obstacles to information and communication technology adoption include a government that does not encourage its use, expensive efforts, complex processes rife with danger, and weak management.

Apart from the technical benefits and challenges of adoption of video conferencing in companies it is useful to observe what are the main factors that help and hinder the implementation of video conferencing in an organization. Larsen (2015) analyzed and presented factors that can help a company manager control the implementation of video conferencing in their teams (Figure 12).

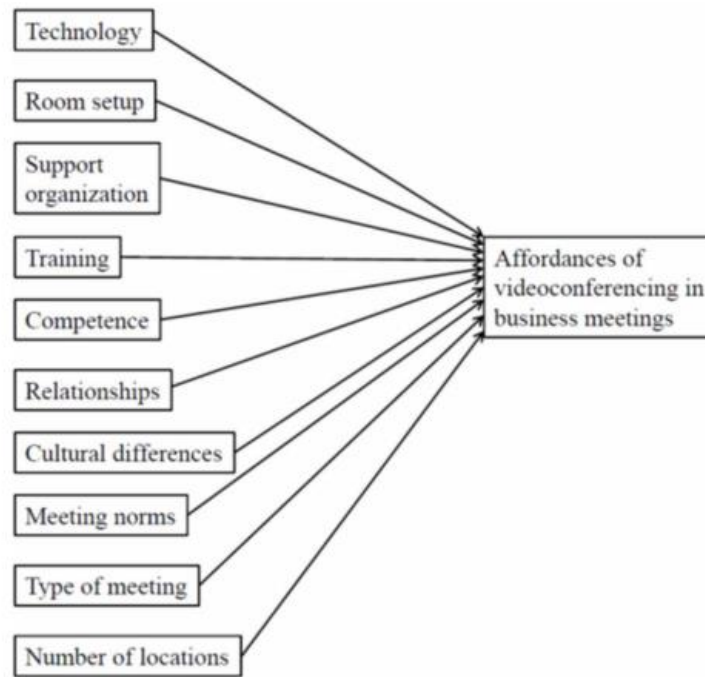


Figure 12 Employees' perceptions of the benefits of video conferencing in business meetings Larsen (2015)

In order to identify the key obstacles to implementing videoconferencing in small and medium-sized firms adopting the technology organization and environment system, a deeper knowledge and use of information and communication technologies is required. This concept, developed by DePietro et al. (1990), examines how an organization decides whether or not to embrace a new technology. An enterprise's current and potential usage of technologies, as well as their availability to the broader public, is part of the technical dimension. Second, features of the company, such as its size, resources, management structure, and methods of communication, might help or hinder the adoption of a new technology. Third, environmental variables include things like government rules, industry features, market structure, and access to technological support infrastructure that are beyond of the company's control.

The technology organization and environment system has been examined in a number of different fields of Information Systems (Baker, 2012; Zhu et al., 2004). Examples include investigating the usage of web-based business(Zhu et al., 2004) as well as improving our knowledge of open systems (Chau & Tam, 1997) and IS applications (Thong, 1999) via the use of this methodology. Technology organization and environment dimensions are shown in Figure 13, and secondary dimensions are often evaluated in the context of the technology organization and environment system. Considering that our research focuses on how ICT and videoconferencing are being used in the SME digital education market, the technology organization and environment method is a natural fit for our research, which explores how technology is being used in organizations rather than individuals. It is one of the most often utilized theories in the study of technology and innovation at this organizational level (Baker, 2012; Zhu et al., 2004).

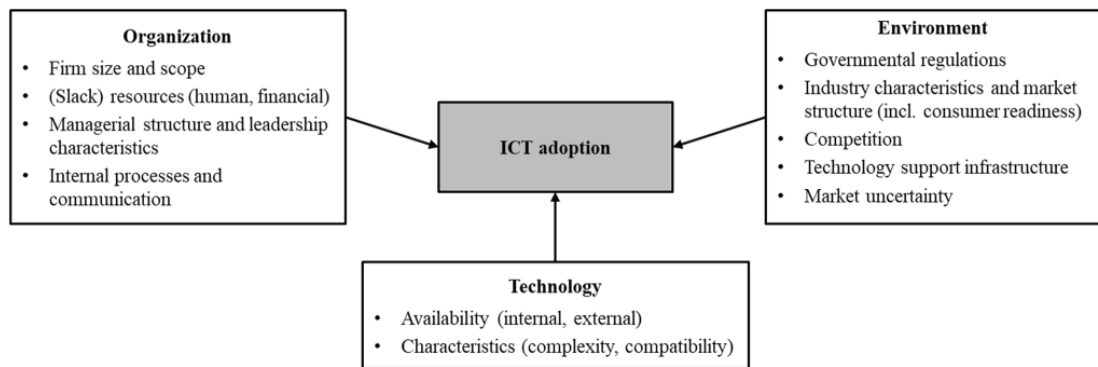


Figure 13 Video Conferencing as information and communication technology technology organization and environment framework applied

2.4. Strategies Employed in Adoption of Video conferencing

According to Ghobakhloo (2011), there are many factors that are strategically important for the implementation of all information technologies and its process, but the most important are the management of the organization, the attitude and features of the company, assets, authorities, clients, providers and independent information technology experts. Factor that has impact in video conferencing implementation are divided into internal and external categories. According to Tang (2012), internal factors are those that include only what is inside and outside the company, and external factors are those that describe where and with whom a company operates.

2.4.1. Internal Factors

Top Management

One of the most decisive factors in a company is its management. Implementing information technology in a company is no exception (Nguyen, 2009). Fuller (2006) adds that the role of management is extremely important, because the decisions they make are key and determine the company's performance both in the current situation and in the future. Moreover, past study reveals that top executive demographic features as well as personality qualities of openness are key drivers of information technology use effectiveness and attitude inside companies, relying on upper echelon theory (Chuang, 2009).

Lefebvre (2006) argues that it is important to consider the company's management when analyzing important decisions in a company, such as the implementation of information technology. This type of company, which already has high technology in its organizations, Calderia (2007) confirms this statement by emphasizing that the more competencies management has, the more innovative the company is and the more information technology it employs in its operations.

An analysis of the literature has shown that the implementation of information technology in companies is a very important indicator of a company's success in using information technology from a company-wide perspective (Ghobakhloo, 2010). Another important factor in management is the ability of managers to innovate both in terms of information technology and on a company-wide basis (Ghobakhloo, 2011).

Resources

Large organizations have adequate resources to implement information technology implementation processes and to acquire appropriate equipment, while small organizations do not have adequate financial resources (Nieto, 2007). Nguyen (2009) argues that small and medium-sized businesses due to their characteristics such as finance, information technology mentoring resources and lack of knowledge, lack of competence face barriers to the proper and efficient implementation of information technology in the company. It is stated that the more resources a company has, the more information technology is available and the implementation of video conferencing in the company is smooth (Ein-Dor (2008).

Cragg (2005) also argues that small and medium-sized enterprises do not have much understanding of information technology, which directly affects how quickly an enterprise assimilates information technology. The consequence of this is that small and medium-sized enterprises have many problems that cannot be easily addressed and this increases the risk. The problem is not always finance, with the right IT knowledge we can avoid the financial burden that is associated with information technology. In order for the company to apply information technologies quickly and efficiently, it is necessary to maintain the knowledge of information technology not only at the level of managers but also at the level of employees.

End Users

Employees of companies are one of the most precious resources of an organization, but they are also the most valuable assets as they create added value and grow the company. They also contribute a lot to the growth, value and development of the company. However, it is not enough to have employees, it needs to be cared for and educated in order for a company to thrive and grow Zhou (2009). The knowledge of employees or, in other words, information technology users strongly influences the adoption of information technology.

If an organization and its employees do not have the right information technology knowledge technologies including video conferencing, they will not be used effectively and the software purchased by the company without the right knowledge will be meaningless and unprofitable (Calderia, 2007). Knowledge of information technology, continuous improvement, information sharing and, most importantly, company management must invest in this to help avoid such a situation (Ghobakhloo, 2010).

According to Thong (2007), if organizations want to implement information technology and do so efficiently, they should promote the growth of their employees' knowledge in the field of information technology, do training, and raise awareness of information technology. The adoption of information technology in the company is influenced by two factors: the perception of the simplicity and usefulness of information technology (Igabara (2007)). indicator of the implementation of information technology in the company, so the employees of the organization must be trained in the field of information technology to ensure the success of the company.

Organizational Characteristics

According to Acar (2005) previous information technology adoption research has identified a variety of organizational variables as possible influencers of the adoption process, including strategy, company size, industry type, information intensity, organizational culture, and technical maturity. Information technology tools are strategically used inside enterprises to fulfill a defined business plan. According to Levy (2007) as a result, a company's information technology expenditures are heavily influenced by its strategic environment, such as cost-cutting vs value-added plans. Many firms embrace modern IT just to stay up with other enterprises that have already done so. In such cases, the absence of a clear definition or approach for the goals of information technology adoption would result in project failure (Nguyen (2009).

One of the most significant indicators of information technology implementation is the size of the company. Firm size is significant in part because it serves as a source of the firm's competences (Mole, 2004). The definition of the industrial sectors to which they belong is another business factor that influences the adoption of information technology in enterprises. Previous research suggests that the kind of company and the amount of information within the organization are drivers of information technology implementation (Ghobakhloo, 2011).

2.4.2. External Factors

External and Competitive Pressure

In this technologically advanced world, many different companies and organizations are under competitive pressure, forcing companies to use a variety of information technology solutions, including video conferencing solutions, to remain competitive, proprietary, and evolving in order to survive and grow their businesses or organizations. (2009). According to Levy (2006), research shows that Small and medium-sized enterprises respond strongly and sensitively to customer needs, and often small and medium-sized organizations often use a variety of IT solutions, including video conferencing, to adapt to customers and partners.

Thus, for small businesses and organizations, the adoption, possession and use of information technology becomes critical to the organization's operations, but it is known that the main reason for implementing information technology and its infrastructure in the company or organization is internal factors such as industry change, market share, entry into new markets, the opportunity to develop a business and remain innovative in a rapidly changing world (Southern, 2009).

Information Technologies a Solution

According to Salmeron (2006), the implementation and implementation process of information technology as well as video conferencing tools in companies and organizations strongly depends on the characteristics of information technology. These features can include many factors, such as their type, the interconnection and interoperability of processes, the ease of management and use, the awareness of the software, its quality, or even the cost of the information technology being deployed.

According to Shin (2006), the most productive and efficient information technology software in enterprises is the one that is already used in practice and has the longest experience in the operation of processes. They are more effective when compared to the most recent programs. When making

decisions on the application and implementation of information technologies and their systems in the company, the most important thing is to take into account their speed and efficiency. In other words, according to Sardana (2008), in order to implement information technology in an enterprise to improve organizational performance, it is essential to consider software quality.

Grandon (2004) states that existing information technology products, their properties, integration with other systems and security are the most important factors in the application of information technology in the company. Adaptation and interoperability of information systems is a complex and important process. According to Amako (2004), the individuals who developed the Diffusion of Innovation theory have the best understanding of the identification of application systems and know best how to best apply a new information technology system in an enterprise.

According to Hang (2006) and Nguyen (2008), the adaptation of information technology in enterprises is most influenced by the compatibility of information technologies and their systems and products, and managers must have the appropriate competencies to make the right decision to choose the most productive and efficient information technology organization.

External IT Consultants and Vendors

According to Ghobakhloo (2011), the smooth selection and implementation of information technology is influenced by vendors and consultants of information technology and their systems who are specialists in their field and can not only help to select the most suitable program, but also help to implement it properly. Nguyen (2009) emphasizes that the advice and counseling of these experts can help the smooth implementation of information technology, although it is mentioned that the wrong choice can affect the quality of process implementation. external consultants to solve these problems or to develop the IT literacy of their employees, who are the ones who use the installed software (Cragg and Zinatelli, 2005)

Government Support

Ahuja (2009) argues that a significant role in information technology is played by the government, which willingly encourages companies to improve by providing various means, including financial ones. According to Sarosa (2008), small and medium-sized enterprises are often more dependent on public funding than other large corporations due to their small budgets and lack of other resources.

2.5. Web Conferencing in the Most Commonly Used Industries

There are many industries in small and medium-sized enterprises and in the business as a whole. All of these industries use the tools they need to carry out their tasks and achieve their goals. Information and communication technology (ICT) is one such instrument, without which today's businesses would be unable to go about their everyday operations. Video conferencing, or web conferencing, is one of the most widely used information and communication technology tools in today's modern world of information technology. Most businesses and organizations now use the technology as a result of COVID-19. Educational institutions and organizations have been major enablers of this information and communication technology revolution.

There are a variety of ways in which online education has evolved, both in terms of the technology involved and the pedagogies and learning methods used (Laurillard 2012, Rice 2011). Asynchronous or synchronous engagement in class is also a form of on-line learning. Because it allows for simultaneous face-to-face connection, videoconferencing is a tool that gives online students a more direct and immersive learning experience. In education, video conferencing has evolved into two primary forms: It has been around for a long time and is used for a variety of purposes, such as connecting two or three campuses or bringing foreign guest lecturers to a distant location. Laptop/web-based forms, which employ personal devices like PCs or tablets and are software solutions, allow students to opt to sit individually at home or together on campus, utilizing live-streaming from everyone to everyone. This is an advantage over (Roberts 2009). The two forms both have a significant influence on the learning design since the first takes place in the classroom and the instructors' physical position there, while the second employs a shared laptop area as the beginning point of the activity.

Several scholars have analyzed the research and provided theoretical insights into the readiness of video conferencing for deployment and deployment in enterprises. Teachers and students who took part in the study gave positive feedback on video conferencing (Clayey and Griffith, 2006). The material reveals that the introduction of video conferencing in the field of education has seen positive changes shown in Figure 14.

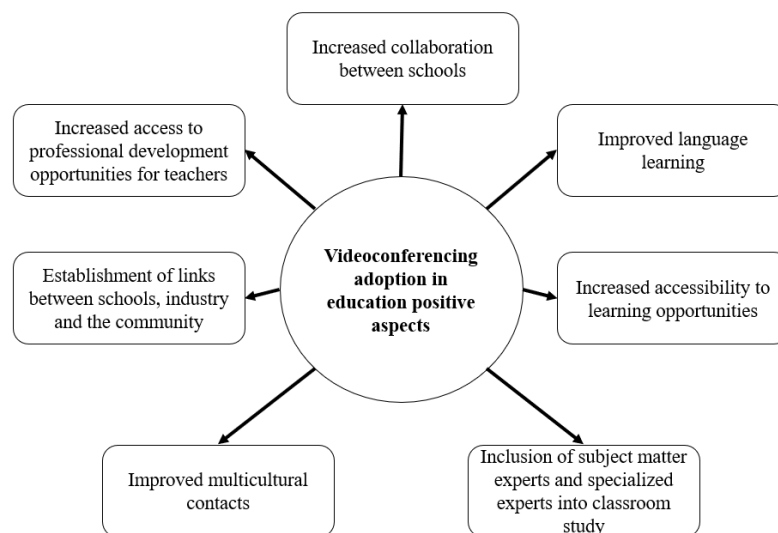


Figure 14 Videoconferencing adoption in education positive aspects (Clayey and Griffith, 2006).

An economic study of a videoconferencing program in Canada's remote distant schools was undertaken by Hepburn and McMillan (2008). In each of the five high schools, powerful Video Conferencing suites were installed in each of the personal computers. The suites were predicted to cost \$445,000 per year by Hepburn and McMillan. Additionally, they gathered year-end achievement data on students who took all of their classes via video conferencing and then compared it to similar statistics from students in the district who took their classes via correspondence or audio graphics in order to perform a cost-effectiveness analysis. A quasi-experimental study design and quantitative data analysis approaches were used by the writers. A cost-benefit analysis showed that Video Conferencing delivery was better for students' learning outcomes than the other options.

Video Conferencing with little children was studied by Yost (2007). The two kindergarten classrooms were able to communicate through videoconference on a daily basis. Children had a good time, had a better grasp of technology, and were more aware of their surroundings as a result of the exercise, according to the author.

A study by Cifuentes and Murphy (2008) found that distant learning and multimedia technology were both effective and efficient. Interactive Video Conferences allowed students to work together and exchange multimedia materials. Expanding the learning community was made easier by using technology. Teachers built trusting, mutually beneficial connections with students from many ethnic backgrounds. Students gained an appreciation for other cultures and a positive self-image.

High school students' usage of Video Conferencing was studied by Gage, Nickson, and Beardon (2006). Technology allowed pupils to collaborate with students in other classrooms. Collaborative activities were deemed beneficial by teachers, who noted that pupils often worked on difficulties outside of the standard curriculum. Participating in presentations and discussions on mathematical issues gave students the chance to interact with one another.

Using Video Conferencing to take students out of the classroom, Hung and Tan (2004) provided situated learning as a theoretical foundation and proposed activities and results that are congruent with this theory. Teachers may boost student learning by linking them to real-world specialists, such as scientists, experts, and professionals. By using telementoring, students may learn about teamwork.

Using Video Conferencing to prepare for and potentially replace field trips is explained by Pachnowski (2006). She contends that virtual field excursions are more cost-effective and alleviate issues such as student transportation, safety, and time restraints by using the internet. A virtual field trip provider is found, features are examined, a class is prepared, and charges are discussed by Pachnowski. Video Conferencing, she claims, provides new chances for curriculum expansion, cost savings, and educational advantages when used in schools.

It was found that video conferencing might help elementary school students collaborate on assignments across the globe. Educating students about other cultures was an important part of the project's mission. In Scotland and the United States, students gave presentations to each other. According to Thurston, students' definitions of ethnicity and attitudes toward people of color have evolved throughout time.

Videoconferencing systems in e-learning

Videoconferencing is a real-time method of transferring data, including audio, video, and speech, between a small group of individuals and a larger one (Wiesemes & Wang, 2010). Teachers and students may communicate in real time using the synchronous approach, regardless of where they are physically located. This eliminates the lower level of involvement and engagement that can be created by asynchronous communication because of the delayed response (F. Martin, 2012). Videoconferencing technologies have been proven in remote education research to give real-time contact, quick feedback and present new options for cooperation in remote learning (Kumar et al., 2015).

It is thus possible to utilize videoconferencing to educate and communicate in synchronous remote education. Additionally, videoconferencing technology provides professors and students with the ability to communicate through audio, visual, and vocal communication with other participants. As a

result, videoconferencing in distant education may create a learning environment that is more similar to a real classroom.

Online learning and teaching might benefit from videoconferencing systems from a sociocultural theory and constructivist viewpoint. Learners' interactions and experiences with others are a source of knowledge, according to social constructivism (Hagstrom & Wertsch, 2004). People's learning and development are founded on their participation in cultural activities across a broad range of social systems. Videoconferencing, according to Wiesemes and Wang (2010), expands classroom borders, blurs the line between virtual and actual classrooms, and eliminates the physical constraints of conventional classrooms. Involvement with their surroundings, classmates, and teacher is increased, as is the breadth of the student's learning experience.

Students' opinions of videoconferencing may have an influence on their performance in remote education (Candarli & Yuksel, 2012). Over eighty percent of pupils responded positively to a research done by Dogget (2008), however over eighty percent of those kids said they would feel better at ease in a typical classroom. To some extent, the videoconferencing system's performance was influenced by its own quality. Technical issues such as frequent disconnections, poor sound and picture quality, and a time gap between voice and image were cited by students in a similar study in 2011. Quality of the videoconferencing system has an unmistakable impact on interactions and learning outcomes in general (M. Martin, 2005). But it's worth noting that web-based videoconferencing technologies like "Zoom", "Skype", "Teams", and "WhatsApp" have progressed dramatically in the previous decade. The time lag between sound and picture has been decreased to 300 ms with the current technology, which provides better image, sound, and connectivity (Smith, 2020). Teachers and students are more familiar with these systems now that they have had more time to use them in their professional and personal lives.

Synchronous and Asynchronous E-learning

Asynchronous or synchronous e-learning is possible. Real-time synchronous learning happens in which all participants engage at the same time in order to maximize learning outcomes. Asynchronous learning allows students to choose their own pace. So people may communicate ideas or information without being reliant on the participation of other participants.

One or more participants share thoughts and information at the same time in synchronous learning. A synchronous communication is one that occurs in person. There are several ways that students and teachers may communicate in a virtual classroom, but the most common one is via real-time synchronous communication, such as through Skype or chat rooms. In synchronous settings, there are many forms of interactions, including as chats, real time audio, application sharing, whiteboards and webcasting as well as video teleconferencing, which necessitates further assesssmall and medium-sized enterprisent of usability and usability of the environment.

It is possible to study at one's own speed in asynchronous online classes. "Learning at any time and anyplace" is the premise of this program. Asynchronous learning may be accomplished using email, blogs, discussion forums, web-based textbooks, hypertext texts, audio-video courses, and social networking (Loutchko, 2002).

If you're a slow learner, have a health issue, or have childcare duties, asynchronous learning might be a great option. Students in this atmosphere have less pressure to finish their work and a more

flexible time limit. Listening to a lecture many times is permitted for students who need it, It's their decision how long they spend pondering a subject, and they may do it at their own pace.

Students may also enroll in college courses, internships, sports, or jobs and still graduate with their class via online learning, which provides a wide range of enrichment courses. To succeed with any technique, students must be self-motivated and disciplined and have a good command of the English language (Maricopa, 2013).

The Use of Videoconferencing Platforms for E-learning

Eight guiding principles were developed by Siemens and Downes (2009) as a new learning framework for the digital era (Figure 15). According to this approach, the utilization of technical resources is essential for an efficient online learning process to take place. According to these pioneers of the connectivism movement, it is an emergent educational technology paradigm that draws from the foundational principles of education (behaviorism, cognitivism, and constructivism).

Connectivism principles

1. Learning and knowledge rest in the diversity of opinions
 2. Learning is a process of connecting specialised nodes or information sources
 3. Learning may reside in human and non-human appliances
 4. The capacity to know more is more critical than what is currently known
 5. Nurturing and maintaining connections is needed to facilitate continual learning
 6. The ability to see connections between fields, ideas, and concepts is a core skill
 7. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities
 8. Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. Although there is a right answer now, it may be wrong tomorrow because of alterations in the information climate affecting the decision
-

Figure 15 Principles of the connectivism learning framework (Siemens & Downes, 2009)

According to Siemens (2014), in connectivism, learning and knowledge are based on a wide range of viewpoints. The goal of using videoconferencing technology is to engage students in the social production of knowledge (the exchange of ideas) rather than just have them absorb information passively (Griffin & Cole, 1984). Teaching may thus become more student-centered, with a focus on practical problem solving and the sharing of knowledge between students and lecturers as a key component of genuine learning.

As a result of this, and according to Downs (2010), for e-learning to operate, there must be a network of interactions between people, groups, and technology resources rather than just the exchange of knowledge or experiences between individuals. Therefore, in order for online teaching and learning to be effective, connectivism encourages professors to assist students by making sure that hardware (such as a cell phone, laptop, or workstation) and software (such as Zoom or the Internet or other similar tools) are readily available so that students can join in with the online lectures (Khoza, 2019).

Students and professors may communicate through a variety of technology means (LMS, SMS, VCT), including non-human devices, for the purpose of disseminating information, which is a key strength of connectivism in online education (Siemens & Downes, 2009). As a result, professors will be able to cultivate and maintain effective relationships that enable them to have access to specialized and up-to-date topic material, so facilitating continuous teaching and learning (Kop & Hill, 2008; Siemens, 2005).



Figure 16 Reconceptualising online teaching and learning with videoconferencing tools

Figure 16 proposes an eight-level hierarchy for rethinking connectivist education and learning using videoconferencing technology. The first level (number 1) indicates the most fundamental consideration, which is followed by all others (number 8) in the decision-making process. Students' identities may impact their usage of videoconferencing technology since professors strive to know who they are. Since lecturers cannot address student or societal requirements without first understanding their own identity (self-direction), this is a necessary first step in addressing student and societal concerns using the resources now accessible in higher education (hardware and software). Educators need to take on the role of researchers in order to uncover new technology discourses in the area and communicate updated knowledge through new online pedagogies. The justification for using videoconferencing technology for online teaching and learning is critical to its effectiveness.

Summary and theoretical model

A lot of different authors and scholars have described and identified external elements that have a big influence on the growth and development of small organizations. Innovation and technology it is one of the most important roles in the development, growth and success of Small and medium-sized enterprises. Based on the analyzed theoretical aspects, which determine which factors have the greatest impact on the growth and development of Small and medium-sized enterprises, it is important to emphasize that the growth of Small and medium-sized enterprises is also influenced by the technological factor, which includes information technology, which includes many components, including information and communication technology. Even though information and communications technology has been shown to save costs and enhance fundamental business operations, Apulu and Latham (2010) stress the importance of using information and communications technology in small and medium-sized enterprises.. Small and medium-sized businesses may gain a competitive edge via the effective use of information and communications technology.

As we already know, information and communication technologies have a major positive impact on small and medium-sized businesses. However, it has been mentioned in the analyzed literature that

the implementation of information and communication technologies such as videoconferencing tools presents challenges. The most important factors were mentioned as support, infrastructure, experienced employees. Adoption of videoconferencing challenges are indicated as lack of human capital, lack of security, lack of infrastructure, lack of finance.

The presented solutions were also analyzed for the challenges identified in the theory. Various literature on the adoption of videoconferencing challenges distinguishes between internal and external solutions such as top management, resources end users, organizational characteristics, external and competitive pressure, information technologies solution, external information technology consultants vendors and government support. After analyzing TOE model, video conferencing tools adoption challenges and solutions the theoretical model was constructed which is presented in Figure 17.

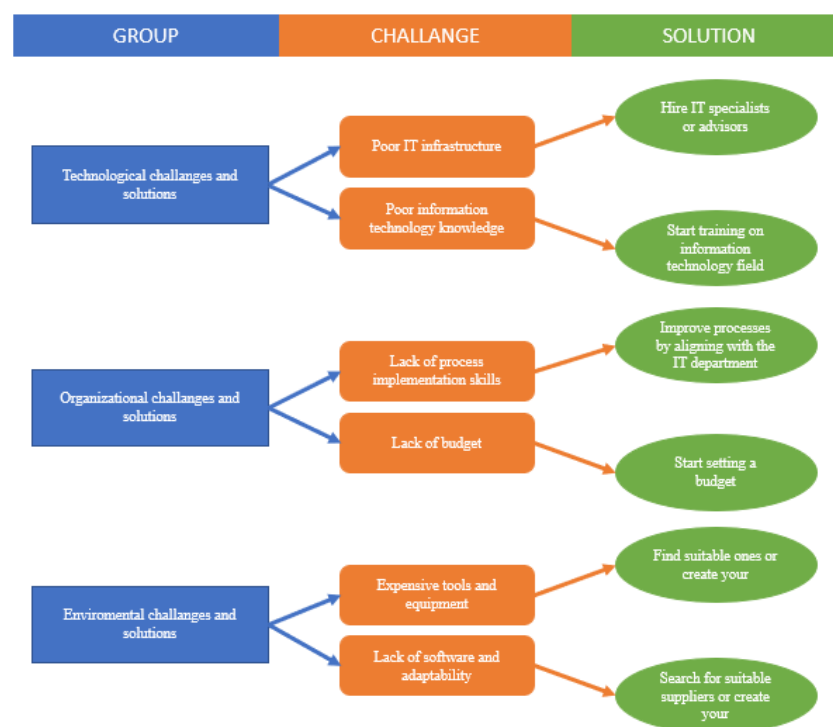


Figure 17 Model of Overcoming Challenges to Adoption of Video Conferencing Technologies in Small and Medium-Sized Enterprises

Teachers and students may communicate in real time using videoconferencing. This eliminates the lower level of involvement and engagement that can be created by asynchronous communication. Technology provides professors and students with the ability to communicate through audio, visual, and vocal communication. It could create a learning environment more similar to a real classroom. Videoconferencing blurs the line between virtual and actual classrooms, and eliminates physical constraints of conventional classrooms. Students and professors may communicate through a variety of technology means, including non-human devices. As a result, professors will be able to cultivate and maintain effective relationships. The justification for using videoconferencing technology for online teaching and learning is critical to its effectiveness.

3. Methodological solutions

This section presents the research methodology, which includes: a description of the research problem, a definition of the research objective, a rationale for the chosen research method and units of analysis, data collection methods, sampling, transcription principles, research ethics, and research process descriptions.

Research Problem

A lot of research has been done on the benefits of using video conferencing tools in small and medium-sized businesses, but the scientific literature does not focus too much on the main barriers to adapting video conferencing tools and how those barriers can be removed. Based on the theoretical model of video conferencing as a part of information and communication technology and conducted empirical research, the aim is to find out what are the main barriers determining the adaptation of video conferencing in the small-medium enterprises. The main problem question of the research is - how are video conferencing tools adopted at small and medium sized digital education enterprises in Lithuania?

Aim of the Research

The aim of this study is to conduct empirical research examining how small and medium-sized digital education enterprises are adapting video conferencing.

Research Method

In order to achieve the goal of this work, which is to get known how small and medium-sized digital education enterprises are adapting video conferencing, a qualitative study is needed. This research method would help to reveal how are video conferencing tools adopted at small and medium sized digital education enterprises in Lithuania.

Empirical Research Objectives

1. To conduct a case study on how small and medium-sized digital education enterprises in Lithuania adopt video conferencing
2. To provide recommendations on how small and medium-sized digital education companies can better adapt video conferencing

Research Design

As it is mentioned before, the aim of this empirical study is to conduct a case study examining how small and medium-sized digital education enterprises are adapting video conferencing. In order to better comprehend the novel occurrence, this study aims to reveal and explain the connections between the variables assessed (Saunders et al., 2007) that is why we employed an explanatory research design and methodologies of qualitative research to define study components, to analyze, compare, and evaluate the results of our studies (Hair et al., 2007).

Among the most relevant research methods for answering research questions, identifying the dynamics of phenomenon evolution, identifying unique facts, and clustering complicated data, we used the case study approach (Yin, 1994). The case analysis is one of the best techniques to get a better understanding of a subject when there are a variety of opinions in the scientific papers (Eisenhardt, 1989). The case analysis guarantees that the study object is examined in a variety of ways, allowing for a thorough comprehension of the phenomena (Baxter & Jack, 2008).

Coordination of primary and secondary research methodologies allowed for triangulation of data, which ensured the validity and dependability of the findings (Hair et al., 2007; Saunders et al., 2007). Semi-structured in-depth interviews were used to gather primary data. In order to use this technique, a research instrument including preparatory questions was created; the order in which the questions are asked may vary based on the interview procedure, the responses of the interviewees, and any other relevant variables (May, 1996).

According to Vanhaverbeke et al. (2012), small and medium-sized businesses are affected by information and communication technology in diverse ways, and research on information and communication technology in the context of small and medium-sized enterprises is lacking. As a result, the study focused on small and medium-sized businesses in the Lithuanian digital education field. In the education sector during the pandemic, videoconferencing as a teaching tool to convey knowledge has become particularly relevant. In the midst of the epidemic, more and more companies offering supplementary instructional services are springing up and offering their products and services to students through videoconferencing. Therefore, the appropriate adaptation of videoconferencing as an information and communication technology tool in the company has become extremely important. The firms selected for this research had to meet the following criteria:

- The company under analysis must be a business operating in the field of education providing teaching services to clients;
- The company being analyzed must meet and be identified as a small and medium-sized company;
- The participating company must have one of the information and communication videoconferencing tools.

Research Limitations

During the qualitative research, limitations were encountered that prevented a broader survey due to the limited number of companies in Lithuania and the refusal of respondents to participate in the survey.

4. Research Findings

The findings of the qualitative study, as well as the interpretation of the findings, are discussed and illustrated during this stage of the project's. In addition, the validity of the data and outcomes is shown by empirical evidence. This section also includes a summary of the study's findings, a discussion of the study's shortcomings, and a discussion of prospective future research possibilities. In addition, recommendations for overcoming the difficulties associated with the use of video conferencing technology in small and medium-sized businesses are provided in this paper.

4.1. Research Results

Small and medium-sized Lithuanian companies providing digital education services participated in this research. These companies mainly provide an additional education service also known as tutoring. Due to the developing industry, there are not many companies in this segment in Lithuania. In total, four companies in this field agreed to participate in the investigation. The table 1 shows the main characteristics, parameters and information of companies such as firms main activity, firms life (in years), firms main customer, firms location of services provided, firms number of customers and firms business model. These companies mainly teach school-age students to help them prepare for exams or delve deeper into the subject. As this paper analyzes the barriers faced and overcome by small and medium-sized enterprises, it also influenced the respondents and their choice. As a result, the longest-running company is 5 years old, with more than 1,000 customers, and Company B, which has the largest number of customers, has 5,000 customers. All this information was obtained through official sources about the companies and through interviews.

Table 1 Comparative table of analyzed firms

Parameter Firm	Firm A	Firm B	Firm C	Firm D
Main activity	Field of school education (1 – 12 grade)	Field of school education (1 – 12 grade)	Field of school education (1 – 12 grade)	Field of school education (1 – 12 grade)
Firms life (in years)	1,5	2	5	2
Main customer	Students, graduated students and teachers	Students and graduated students	Students	Students
Location of services provided	Online	Online	In physical classes and online	Online
Countries where services are provided	Lithuania, Romania, Albania and Azerbaijan	Lithuania, Greece and Ukraine	Lithuania	Lithuania
Number of customers	1000	5000	1200	1400
Business model	Digital	Digital	Mix of digital and traditional	Digital

Firm A - the first surveyed company provides additional training and tutoring services. It has a digital business model and is fully operational. This means that it uses various videoconferencing tools to provide its service. This company is unique in that it specializes not only in the additional education of students, but also teaches graduates, who are helped to prepare for taking the exams. Also, when she singles herself, she teaches the teachers themselves. Prepares seminars for them on the latest teaching methodologies or changes in the guidelines of the education system. Although the company calls itself a start-up and has only been operating for 1.5 years, it already has 1,000 customers and is expanding its operations to other countries such as Romania, Albania and Azerbaijan. The uniqueness of this digital education company from the others is that it provides teaching services only individually it is only for one student.

Firm B - the second company is the leading and fastest growing digital education company in Lithuania. They have been in operation for two years and have more than 5,000 customers. The operating principle of this company is digital meaning that they provide their services using only videoconferencing tools. Their basket of services includes only 1 to 12 students of the class, who are helped to prepare for exams or delve deeper into the subject. It is worth noting that the company specializes not only in traditional lessons taught in schools, but also in additional disciplines such as law or marketing, which are currently being introduced in newly taught public schools. The uniqueness of all the companies analyzed is that this company does not use other videoconferencing tools to perform the main service that is to teach children. They created their own videoconferencing product that was modeled according to their needs. It is also worth mentioning that the company operates not only in Lithuania, but has expanded beyond it and currently provides services in Greece and Ukraine.

Firm C - the third company is the oldest company providing digital education services. This company specializes only in the subjects taught by public gymnasiums and helps students prepare for exams and gain a deeper understanding of the subjects taught. The operating model of this company is semi-traditional, semi-digital. This is because the company has been the longest-running of all respondents, even for five years, and before providing digital education services, they provided additional training services live in their classrooms. They keep the contact alive to this day, but according to the respondent, they are increasingly moving to the digital model, as it makes it easier to reach students, train them and achieve the desired company result. It is worth noting that they also focus on the preschoolers they are preparing for first grade. This company operates only in Lithuania, but this year it has already started to expand into unnamed markets.

Firm D is the last, fourth company to provide digital education services like any other. This company is in its second year of operation and has more than 1,400 customers. The operating principle of this company is digital which means that the company only operates online by providing its services using videoconferencing tools. This company provides services from first to twelfth-grade students by providing them with a tutoring service, allowing students to better prepare for exams and delve deeper into the subject. It is worth mentioning that this company is most focused on gymnasium students, as the need for the subjects to be taught is felt here the most.

4.2. Review of Research Results of Overcoming Challenges to Adoption of Video Conferencing Technologies in Small and Medium-Sized Enterprises

The aim of this research was to identify barriers and methods for overcoming them in the process of adoption of videoconferencing in small and medium-sized enterprises. Each survey participant presented and identified the specific barriers encountered in adopting videoconferencing tools in the company. The interviewees also provided solutions to the problem encountered in adopting videoconferencing tools in the company. The whole process of implementation of videoconferencing tools in a company is not without its small or large barriers during the installation phase. It is very important to find out how the surveyed companies circumvented and solved these obstacles. The tables provided below present the challenges identified by the interviewees in implementing videoconferencing tools in small and media-sized digital education enterprises. In a company implementing videoconferencing tools, the main barriers in theory are as follows: poor IT infrastructure, poor information technology knowledge, expensive tools and equipment, lack of software and adaptability, lack of budget and lack of process implementation skills.

Figure 18 illustrates the challenges faced by small and medium-sized digital education companies adapting video conferencing tools. After analyzing the data, we see that all respondents answered that the company encountered poor information technology infrastructure when implementing videoconferencing. Significant challenges included lack of process implementation skills, lack of budget and lack of software and adaptability. Expensive equipment and poor IT infrastructure were the least frequently mentioned challenges.

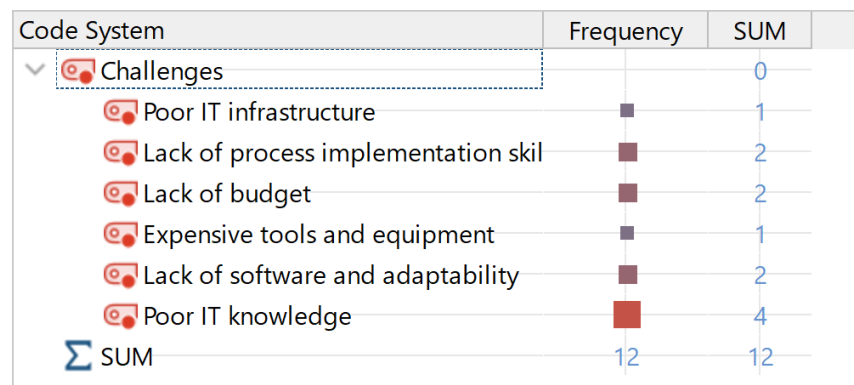


Figure 18 The intensity of the challenges faced by companies adapting videoconferencing

It is important to analyze in detail the challenges faced by the companies interviewed and interviewed. In what follows, we will analyze what challenges companies faced and what the exact reasons were. We will indicate what the main aspects are in the theory.

Table 2 Videoconferencing adoption technological challenges

Sub-code	Firm	Quotes
Poor IT infrastructure	Firm C	“Also, at the very beginning, as soon as we started to go online, not all of us had laptops, so we had to take care of cameras and microphones, and some equipment had to be updated”

Poor IT knowledge	Firm A	“There were also all sorts of technical nuances, but we didn't have our own IT department at the beginning of the installation, so we had to contact the program installers themselves to help solve these obstacles”
	Firm B	“Technical obstacles When the camera is not working, the microphone does not work”
	Firm C	“The student and the teacher were not able to share the call link smoothly: they forgot to send the invitation, they did not send it, and so on”
	Firm D	“The biggest challenge was that some employees did not know how to deal with those simple difficulties”

Technological challenges and their solutions are one of the most important factors in the implementation of videoconferencing tools in small and medium-sized enterprises (Table 2) . The two most influential technological factors have been described in the theoretical literature. One is poor IT infrastructure and the other is poor information and technology knowledge. These challenges in deploying videoconferencing can include a variety of other small barriers such as lack of education in information technology, neutrality in the information technology department, or other responsible person such as external consultants. Poor IT infrastructure can include factors such as the lack of appropriate facilities, adequate facilities, IT support systems, and so on.

The companies involved in the research also faced these and similar challenges. It is worth mentioning that all participants in the survey faced technological challenges. Due to the poor IT infrastructure, Firm C, which has been running for the longest time, has been identified as a challenge. This company had a traditional training business model before moving to distance learning, but they needed to upgrade their equipment when moving to distance learning. All companies surveyed faced a low level of information technology. Although the companies surveyed indicated that they were satisfied with the technological knowledge of their employees, the fact that employees face low technological barriers using a videoconferencing program, which they are not always able to solve, pointed out as a challenge.

Table 3 Videoconferencing adoption organizational challenges

Sub-code	Firm	Quotes
Lack of process implementation skills	Firm C	“It was also difficult to adapt to change without process updates”
	Firm D	“Of course, not knowing how to deploy the entire IT infrastructure was also part of the problem - we didn't properly analyze all the software we were going to work with”
Lack of budget	Firm A	“We can name a small nuance that we did not have a budget and saw an increase in spending”
	Firm D	“The budget was limited, so we had to choose the cheapest possible version of the program, and as a result, we were faced with cheaper programs because their supply was lower”

The second group of challenges shown in the table 3 relates to organizational challenges. An analysis of the theoretical literature identified two main challenges related to organizational challenges. The first major challenge described in the literature is the lack of process implementation skills and the second is the lack of budget. These challenges cover a wide range of problems encountered in deploying videoconferencing tools in small and medium-sized enterprises. It is often stated that companies do not have a practice in the implementation of processes, and videoconferencing is not only the implementation of the program, but the whole process of program identification and proper implementation. Also, the lack of a budget is cited as a challenge. Often, companies focus only on sales and growth, but forget to take care of the equipment that will allow the company to thrive and provide its services.

All companies surveyed except Firm B faced organizational challenges that include lack of process implementation skills and lack of budget problems. Firm C encountered difficulties in implementing the processes, which was difficult to adapt to without having proper implementation processes. Firm D also cited process implementation skills as a challenge because they said it missed one of the key and most important deployment processes – videoconferencing program analysis. Although the lack of a budget for information technology is not described as the main one in the literature, it is described as one of the most common problems. This is evidenced by the involvement of Firm A and Firm D in the plating, who pointed to this challenge during the plating. Firm A indicated that due to the lack of a budget for IT solutions, they noticed increased costs that were out of control. Firm D, meanwhile, points out that their budget was limited due to a lack of resources which affected their further decision as an IT budget increase.

Table 4 Videoconferencing adoption environmental challenges

Sub-code	Firm	Quotes
Expensive tools and equipment	Firm C	“The equipment had to be upgraded - it has its price”
Lack of software and adaptability	Firm A	“We faced the challenge of not being able to hold a larger meeting. That meeting can only be created larger through the API”
	Firm B	“Also, we cannot customize any of the programs on the market for ourselves, as it would not meet our requirements and needs”

The third group discusses the challenges related to environmental challenges. They are presented in Table 4. Theoretical analysis identified two main challenges for this group. The first is expensive tools and equipment, and the second is related to the lack of software and adaptability. The first challenge related to expensive tools and equipment has no more challenges associated with it. He states that videoconferencing tools come at a price and that you have to pay administrative and other fees to use this equipment. Also during the analysis of the literature, it was learned that in order to install videoconferencing tools, you also need equipment: a computer, a camera, microphones, etc. The second challenge analyzes the fact that although many programs have been developed, they are not all suitable and this leads to their lack. Also, the applicability of these programs does not always pay off. Some companies do not find a program to meet their expectations to implement their business vision, so they often have to create such tools on their own.

All the companies surveyed faced this type of challenge except Firm D. Firm C was the only one to report facing a challenge with expensive tools and equipment during the survey. Due to the fact that their respondents have been operating for the longest time and their business model did not require information technology in the past, they had to upgrade their equipment to expand their activities and adapt to the market by moving to distance learning, which they said: “costs a lot of money”. Firm A and Firm B said they faced challenges of lack of software and adaptability. Firm A specifically stated that the program they used did not meet all standards and did not have the specific functionality they needed. Firm B stated that the analysis of the videoconferencing software did not find any suitable program to meet their expectations for a successful digital education service.

As shown in Figure 19, these are the main challenges faced by companies, which are depicted by frequency. The most common problem companies faced was poor information technology knowledge. Medium frequency problems were identified as lack of budget, lack of software adaptability, and lack of process implementation. The least respondents indicated poor information technology infrastructure as a problem. The only company that cited this reason was the one that operates the oldest and converts its business model into digital. This is because the company operated in classrooms and taught lessons physically to students and the need for information technology was low.

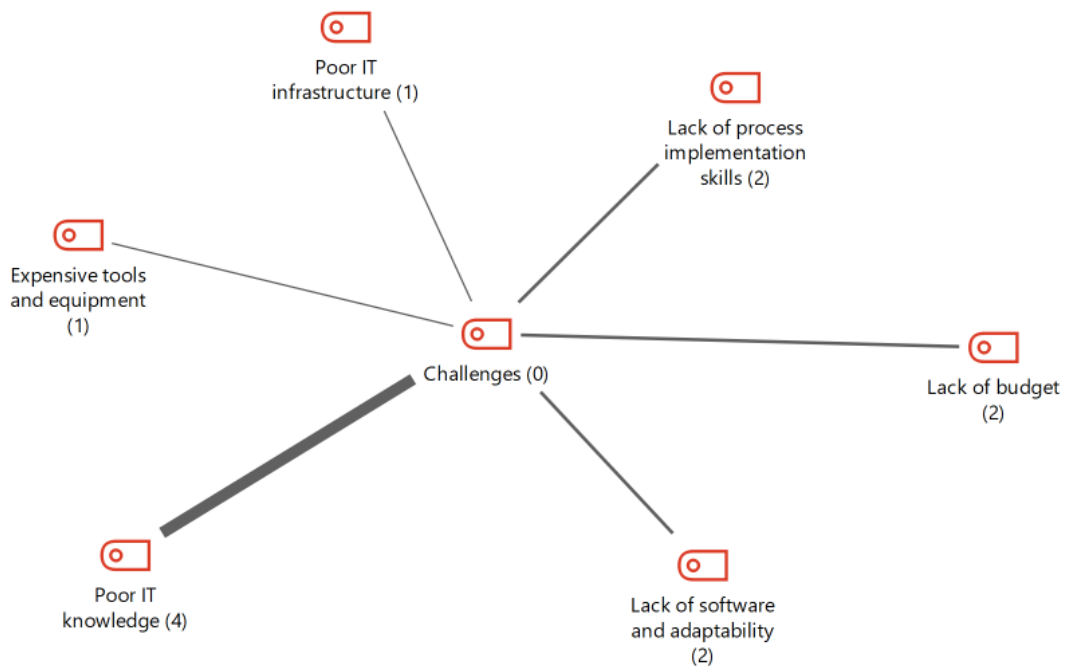


Figure 19 Videoconferencing adoption challenges listed by frequency

There are a number of obstacles that small and medium-sized educational institutions face while attempting to utilize videoconferencing. In this part, the interviewer encounters the problems of deploying videoconferencing technologies and assesses what is offered in the theory. Poor information technology understanding was cited as a problem by a disproportionately high number of survey participants. In a statement made during the plating, Firm A indicated that the firm had to deal with several technological complexities since it lacks an IT staff. According to Firm B, a second interviewee, they encountered issues such as faulty cameras or microphones at the conclusion of the deployment process and some of the company's personnel lacked the necessary skills to resolve these issues. Firm C, a third source of information, claims that professors often fail to provide pupils links to videoconferencing applications because they lack established practices for using them. Firm D, a fourth source of information, pointed out that some of the company's personnel were unable to handle routine issues (Figure 20)

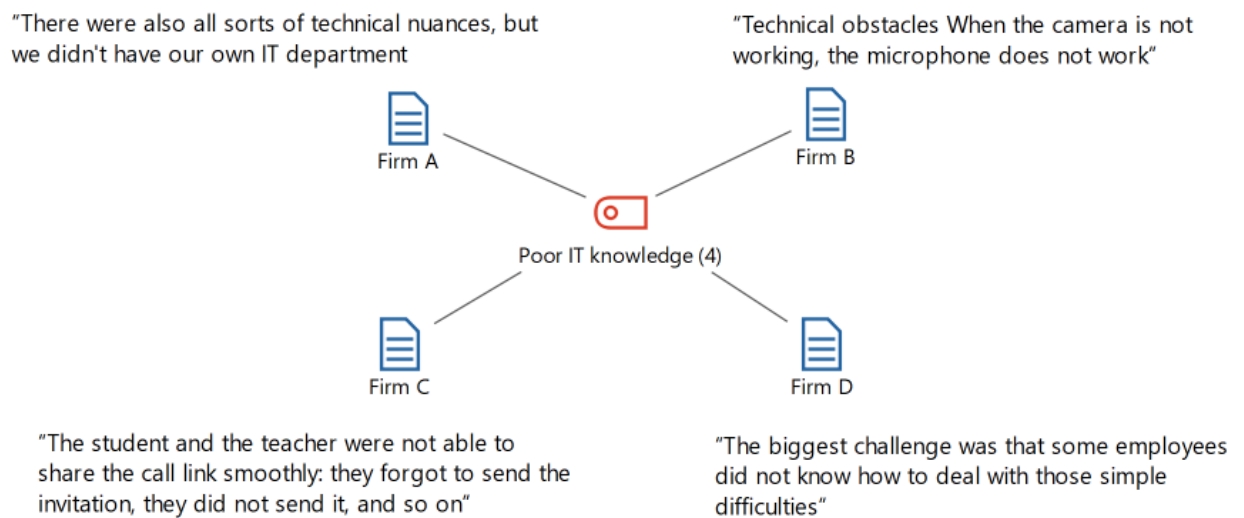


Figure 20 poor information technology challenge, interviews analysis

Videoconferencing adoption solutions to for challenges

The tables provided below present the solutions for challenges analyzed above identified by the interviewers in implementing videoconferencing tools in small and media-sized digital education enterprises. In a company implementing videoconferencing tools, the main solutions in theory are as follows: hire IT specialists or advisors, start training on information technology field, improve processes by aligning with the IT department, start setting a budget, find suitable ones or create your and search for suitable suppliers or create your product.

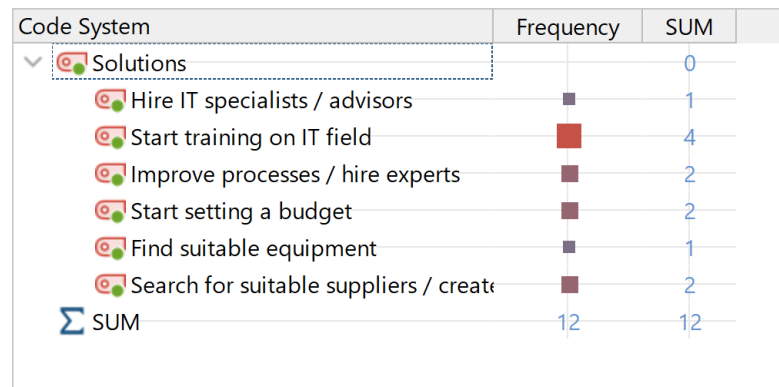


Figure 21 The intensity of the solutions by companies adapting videoconferencing

Figure 21 illustrates enterprise solutions where companies emerged prominently by implementing videoconferencing applications. After interviewing and analyzing the data of small and medium-sized digital education companies, we see that the most common solution to the challenges was to deepen the skills of employees in the field of information technology. Half of the companies surveyed responded to the challenges by solving problems, improving processes, setting budgets and selecting the right suppliers.

Table 5 Videoconferencing adoption technological solutions

Sub-code	Firm	Quotes
Hire IT specialists / advisors	Firm C	“We hired external consultants who advised on the price and quality ratio of what equipment to buy so that we could adapt videoconferencing tools”
Start training on IT field	Firm A	“We also started doing training for our employees”
	Firm B	“The solution would depend on the product, but we would install tools that immediately throw messages about what is wrong e.g. With a microphone. Where the application itself leads to problem solving, not the person who has to help solve the problem”
	Firm C	“Every mistake has reduced the quality of our service. That’s why we’ve introduced customer service professionals who are called and told to have a lesson going on and we don’t have a link. Recurring cases were addressed through special training or in-person interviews”
	Firm D	“As I mentioned, we created short instructional videos”

Earlier in this section, we analyzed the challenges posed by the theoretical literature for implementing videoconferencing tools in small and medium-sized enterprises. In theory, we analyzed and found the theoretical solutions presented as how a company can overcome difficulties in implementing videoconferencing tools. Practical solutions to these challenges were provided by the companies surveyed.

Table 5 highlights two theoretical solutions to emerging technological challenges. The first solution to the challenge of poor IT infrastructure is to hire IT specialists or advisors. This solution includes such factories that the company can hire external consulting companies to help solve any IT problems that may arise. Of course, the theory describes the method that a company can hire an IT specialist who will always help solve problems and improve the company's IT infrastructure. The second challenge is poor information technology knowledge, the solution to which is to start educating your

employees in the field of information technology. The literature also indicates that a company can start hiring properly trained staff.

The only company facing the poor It infrastructure is Firm C, which said it had hired external consultants to help it upgrade its equipment to enable the proper installation of videoconferencing tools. All companies surveyed faced the second challenge of poor information technology knowledge and all provided practical solutions such as how to make instructional videos on how to handle applications, good customer service to help employees and customers solve problems, and the main solution is to automate error correction by specifying how correct your mistakes.

Table 6 Videoconferencing adoption organizational solutions

Sub-code	Firm	Quotes
Improve processes / hire experts	Firm C	“We also resolved the issue of IT infrastructure with the same IT consultants. We now outsource these consultants”
	Firm D	Hire external IT consultants to help coordinate the entire deployment process.
Start setting a budget	Firm A	“We coordinated the financial issues with the suppliers and that resulted in a budget. We then adjusted to our needs when we saw that we had saved our budgets”
	Firm D	“We've started budgeting every year, and as our revenue grows, we're increasing the budget for our entire IT infrastructure. As your budget grows naturally, we can allow better videoconferencing applications”

Table 6 highlights two theoretical solutions to emerging organizational challenges. The first solution to the challenge of lack of process implementation skills is to improve processes by aligning with the IT department. This solution states that the implementation of IT processes such as videoconferencing in the company can be solved by the company's internal IT staff, but the literature also mentions that outsourced consultants can help manage these processes without a large budget. The second challenge of this subgroup is the lack of budget, the solution of which in theory presents how to start setting a budget. While the solution to the problem sounds simple, many companies do not take into account the budget required for information technology in the company, as it is nowadays in digital education that it is the main tool to carry out their activities.

All of the companies surveyed provided solutions to these challenges except Firm B. Firm C and Firm D faced the challenge of lack of process implementation skills. Both companies solved their problems by hiring external IT consultants to help implement videoconferencing tools in the company. Firm A and Firm D faced a lack of budget challenge. Firm A says they initially had to coordinate financial issues with videoconferencing program providers, and from that discussion, budgeting was started to address the IT challenges. Firm D says he faced this challenge by starting to budget when they noticed that without it, there were limited resources available. As they begin to shape the budget and realize its importance, it grows each year in proportion to the increase in sales revenue.

Table 7 Videoconferencing adoption environmental solutions

Sub-code	Firm	Quotes
Find suitable equipment	Firm C	“We hired external consultants to advise you on what equipment to buy to make it high quality and inexpensive”
Search for suitable suppliers / create	Firm A	“We contacted the supplier company and approved the programming solutions”
	Firm B	“And since we haven't found the product we need in the market, we created the videoconferencing program ourselves”

Table 7 highlights two theoretical solutions to emerging environmental challenges. The first solution to the challenge expensive tools and equipment is to find suitable ones or create your own. The theoretical part offers only these solutions to this problem, but it is worth mentioning that in theory it is described in a limited way. The second challenge is the lack of software and adaptability, and the solution is to search for suitable suppliers or create your. The analyzed theoretical literature notes that it is extremely important to find a suitable program for the company. These solutions state that the company that has chosen the videoconferencing tool criteria has only two options or buy a service from the program providers or create a videoconferencing program for themselves. The theoretical literature mentions that the second solution requires significant resources, as it requires hiring IT specialists who develop the program for more than a month and have high salaries.

The surveyed companies all faced challenges in this category except Firm D. The only company that faced the challenge of expensive tools and equipment is Firm C. They note that this challenge was solved by hiring external IT consultants who selected the best software and helped to upgrade the technology. equipment with which to use videoconferencing applications. The second challenge for software and adaptability was encountered by Firm A and Firm B. Firm A struggled by contacting its application vendor, who offered solutions to the difficulties encountered. Firm B encountered difficulties in analyzing the features provided by the program in this case, and their main problem was that none of the programs met their requirements. Firm B decided to hire programmers who designed the program according to their requirements. It is worth mentioning that this company said during the interview that it has no major problems with the information technology infrastructure in the company because it has its own information technology staff.

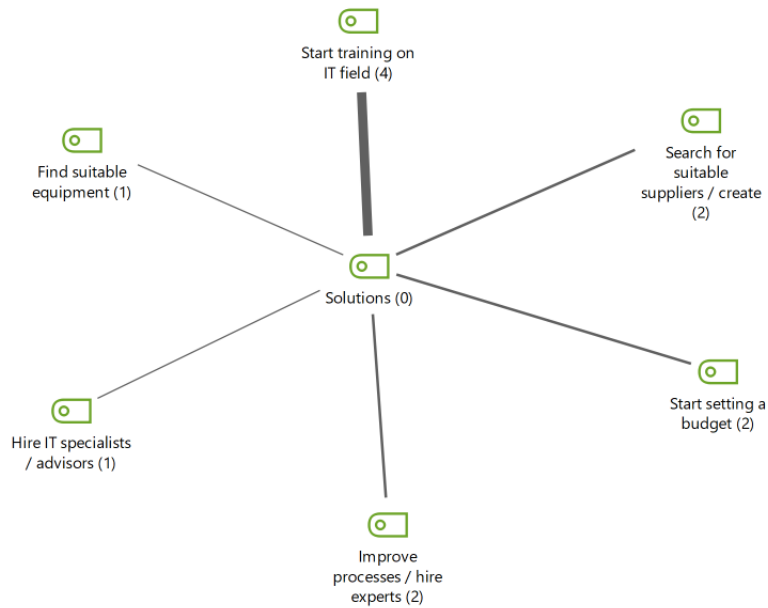


Figure 22 Videoconferencing adoption solutions listed by frequency

As illustrated in Figure 22. These are the key solutions to the challenges associated with adapting videoconferencing tools in an enterprise. These solutions are presented by frequency. In most cases, the companies surveyed provided the need to provide training to their employees in order to deepen their IT skills. Half of the surveyed companies that faced the challenges of deploying videoconferencing tools in their companies said that they had solved the challenges of finding the right software vendors. Half of them also indicated that they had started to budget for information technology needs and had started to improve the company's internal processes. One company cited as a solution that it had hired external consultants to address the challenges.



Figure 23 related videoconferencing tools adoption challenges and solutions

Figure 23 shows the related challenges presented and their solutions. The companies surveyed identified poor information technology knowledge as the biggest challenge. The analysis of the data found a link between the challenges identified by other companies in implementing videoconferencing tools in small and medium-sized enterprises. Poor information technology knowledge can also cause such problems and further challenges in the company as lack of process implementation skills and poor information technology infrastructure. We have already mentioned that poor information technology knowledge can be solved by deepening the knowledge of employees in the information technology field. However, if this stage is missed and this problem poses more challenges then the solution is to improve company processes or hire experts. Unfortunately, the analysis of the data also showed that this may still not solve the problem of lack of software, but taking the first steps to solve the problems of poor information technology knowledge, lack of process implementation skills and poor information technology infrastructure and improving the company's technological infrastructure, software adaptability the problem can be easily solved by hiring IT staff or professionals to help customize applications or create customized applications in the enterprise.

Code System	Frequency	SUM
Success factor in overcoming the challenge		0
Program goals	4	4
Easy to use	1	1
IT support	3	3
Σ SUM	8	8

Figure 24 Success factors in overcoming the challenges

Interviews with companies that have implemented videoconferencing tools asked what are the success factors in overcoming the challenges of adopting video conferencing tools. Respondents cited three success factors: program goals, easy to use, and information technology support. Program goal means that the company must find out what are the most important goals of this program, what will be required from it: functionality, security, speed, etc. before starting the installation of videoconferencing tools. The second factor, easy to use means how easy it is to use the app as easily adapted by the company's employees. The third factor is information technology support. This factor means that the program that the company chooses to use must have good customer support or if the company has its own IT professionals so that they can help with any problems encountered. Most respondents cited program goals as a success factor in the implementation of videoconferencing tools, in that they need to know which program to choose and what characteristics it needs to have before installing it. The second most common success factor in implementing videoconferencing tools was cited as information technology support. Respondents state that the employees using the videoconferencing program do not have experience in information technology and in case of difficulties, specialists with information technology knowledge are needed. Easy to use is listed as the lowest success factor.

Most used video conferencing applications

During the research, we mainly analyze the challenges faced by the digital education company in implementing videoconferencing tools and how they overcame them. However, it is also necessary to find out exactly what videoconferencing tools are used by the surveyed companies in order to better understand how the challenges are related to the applications implemented in the company.

Code System	Frequency	SUM
Videoconferencing tools		0
Teams	2	2
Zoom	4	4
Google Meets	3	3
Skype	1	1
Other / Created	2	2
Σ SUM	12	12

Figure 25 Videoconferencing tools used by frequency

As you can see in Figure 25, respondents identified 5 types of programs they use to communicate with each other and provide a training service to their clients. The companies surveyed use applications such as Teams, Zoom, Google Meets, Skype and other providers or self-developed applications. From the information provided, we see that the most commonly used videoconferencing platform is Zoom, which is used by as many as four respondents. The second most frequently used was the Google Meets videoconferencing program. Only two respondents use the Teams program. Also, several respondents use a specific platform developed by other suppliers or have developed their own platform. The least of all the videoconferencing tools provided is Skype, which is used by only one respondent.

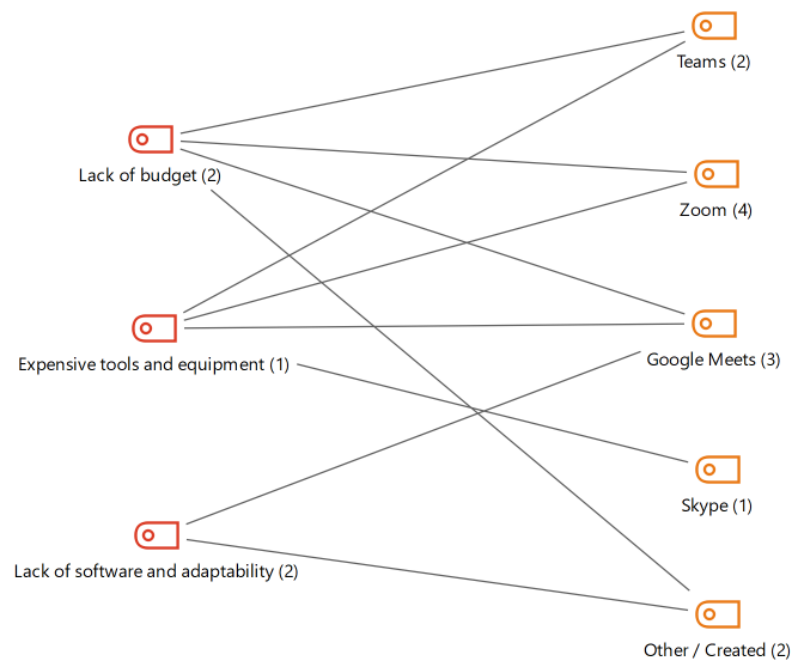


Figure 26 Challenges related to adopted videoconferencing tools

It is important to find out how the challenges are associated with the videoconferencing applications used in the company. The analysis identified three challenges that have the greatest impact on the choice of videoconferencing platforms: lack of budget, lack of tools and equipment, lack of software and adaptability. Analyzing the data, it was found that companies that faced financial challenges such as lack of budget and expensive tools and equipment chose to use free videoconferencing programs described in the literature, such as Teams, Zoom, Google Meets, or Skype. A company that faced the challenge of lack of software and adaptability chose to use a good paid program developed by another vendor or developed a videoconferencing tool themselves. Of course, companies facing this challenge have also indicated that they use cross-communication rather than Google Meets to provide the service. It is worth noting that the biggest challenge is poor information technology knowledge, which does not have a significant impact on the choice of programs to be used by business leaders (Figure 26)

4.3. Discussion and Recommendations

This study revealed that the surveyed small and medium-sized digital education companies which are adapting videoconferencing tools facing the same challenges analyzed in the theory. The results of this empirical study have significant recommendations in practice for companies intending to adapt videoconferencing tools. It is important to review and submit proposals to other digital education companies intending to implement videoconferencing tools in Lithuania.

Poor information technology infrastructure – many companies are exposed to information technology in their business operations. Information and communication technologies predominate among these technologies. Large companies that have large resources, long work experience, and other advantages usually have their own information technology department that takes care of all the technical issues. Small and medium-sized enterprises do not always have such opportunities. If they have information technology and use it in their business, they do not always have the right infrastructure: an information technology department to provide comprehensive information

technology assistance. Poor information technology infrastructure can lead to major technical glitches or errors in related technologies. This is an important part of the company's operations. This can lead to technical barriers. One of the four companies surveyed faced such challenges.

- **Firm C** – this company faced the challenge of poor information technology infrastructure. According to her, they did not have enough equipment to continue their activities and the equipment they needed to upgrade. This company has overcome this challenge by trying to acquire new equipment and upgrade the old one over time. The company also hired external consultants to help with the process of upgrading the information technology infrastructure. Based on the analysis of the theory and empirical research, if a company faces similar challenges in the future, it is recommended to hire external consultants to help upgrade the company's information technology infrastructure.

Poor information technology knowledge –this type of problem has been widely described in theory, and an empirical study has found that most companies have faced this challenge. Poor information technology challenge is related to the low knowledge of all employees of the company, including managers. Although companies indicated that they did not complain about the information technology education of their employees, they continued to point out in the survey that this was perceived as a challenge when videoconferencing tools were introduced. In most cases, companies have indicated that employees do not know how to use specific programs or face day-to-day problems using videoconferencing programs that they cannot solve smoothly. To solve this problem, the literature recommends the use of employee training solutions. Raising the level of knowledge of employees in the field of information technology can avoid similar problems. All the participants in the cladding faced this problem..

- **Firm A** - This company has encountered little knowledge of information technology. According to the company, the challenge was that during the implementation of the program there were various technical challenges that we could not solve, so we had to turn to external information technology consultants. In this case, the literature reviewed in the theoretical part recommends starting information technology training in the company, hiring an information technology employee or hiring external information technology specialists to help cope with the challenges. The solution to this company's problem was that we started training the company's employees. Based on the analysis of the literature and the results of empirical research, a digital education company that plans to implement videoconferencing tools in the future is recommended to provide appropriate staff in advance to ensure the level of information technology knowledge in the company and help develop employees in the field of information technology.
- **Firm B** – this company has encountered little knowledge of information technology. According to the company, the challenge was the introduction of videoconferencing programs for employees, such as a malfunctioning microphone or camera. In this case, the literature reviewed in the theoretical part recommends starting information technology training in the company, hiring an information technology employee or hiring external information technology specialists to help cope with the challenges. The solution to this company's problem was that the company, having its own information technology specialists, asked them to program an automatic error correction solution - when an employee encounters a problem, the program automatically explains how to fix it. Based on the analysis of the literature and

the results of empirical research, a digital education company that plans to implement videoconferencing tools in the future is recommended to provide appropriate staff in advance to ensure the level of information technology knowledge in the company and help develop employees in the field of information technology.

- **Firm C** – this company faced poor information technology knowledge. According to the company, the challenge was that the teacher did not always share a link to an online lesson. In this case, the literature reviewed in the theoretical part recommends starting information technology training in the company, hiring an information technology employee or hiring external information technology specialists to help cope with the challenges. The solution to this company's problem was that the company set up a customer service center and when a similar type of problem arose, the student approached customer service and then had a discussion with the teacher and training on how to avoid such problems in the future. Based on the analysis of the literature and the results of empirical research, a digital education company that plans to implement videoconferencing tools in the future is recommended to provide appropriate staff in advance to ensure the level of information technology knowledge in the company and help develop employees in the field of information technology.
- **Firm D** – this company faced poor information technology knowledge. According to the company, the challenge was that those employees did not know how to solve simple problems. In this case, the literature reviewed in the theoretical part recommends starting information technology training in the company, hiring an information technology employee or hiring external information technology specialists to help cope with the challenges. The solution to this company's problem was to create training videos for employees. Based on the analysis of the literature and the results of empirical research, a digital education company that plans to implement videoconferencing tools in the future is recommended to provide appropriate staff in advance to ensure the level of information technology knowledge in the company and help develop employees in the field of information technology.

Lack of process implementation skills – this type of problem is not described as extensively in the literature as others. The problem with lack of process implementation skills is that companies implementing videoconferencing tools do not have the right knowledge of how to implement implementation processes in the company. The theoretical analysis of the literature provides recommendations in the face of this problem, the need to improve the company's processes or hire external consultants to help coordinate the implementation process of the videoconferencing program. Only half of the surveyed companies faced this problem. In many cases, this problem has been solved by hiring external consultants.

- **Firm C** – this company faced a problem of lack of process implementation skills. According to the company, their challenge was that they did not have significant process coordination skills when providing traditional continuing education services, and when they began to move into online activities, they encountered little knowledge of how to coordinate videoconferencing adaptation processes. In this case, the literature describes that the best way to address this type of challenge is to start improving the coordination of the company's processes or to hire external consultants to help solve the problem and coordinate the entire process of implementing the videoconferencing program. This company solved its problem by hiring external consultants. In the future, companies implementing similar processes are

advised to arrange a responsible person in advance to help coordinate the processes, without having to hire external consultants.

- **Firm D** – this company faced a problem of lack of process implementation skills. According to the company, their challenge was that they did not properly analyze the software without experience in deploying this type of application. the entire videoconferencing program installation process. This company solved its problem by hiring external consultants. In the future, companies implementing similar processes are advised to arrange a responsible person in advance to help coordinate the processes, without having to hire external consultants.

Lack of budget – this type of problem is widely described in the literature. Theoretical analysis often mentions that not setting or not having a budget is one of the main problems in implementing videoconferencing tools. Failure to set a budget can lead to two main problems: will spend more than expected on the adoption of videoconferencing, or the quality of the videoconferencing program will deteriorate without allocating funds to support videoconferencing programs. Two of the companies in the survey were faced with this type of problem. After a literature review, the most common solution to this type of problem is to start setting a budget for this type of program or its equipment.

- **Firm A** – this company faced a lack of budget problem. According to the company, the problem was that they did not have a set budget for videoconferencing programs and its costs increased over time. This company solved the problem by setting budgets for videoconferencing and their equipment and noticed that it was starting to make savings due to cost control. In the future, a company planning to implement videoconferencing software in this type of business is recommended to perform a cost analysis of the program and start budgeting in advance after estimating all the costs.
- **Firm D** - this company faced a lack of budget problem. According to the company, the problem was that without the budget allocated to the programs, they encountered financial difficulties in starting to implement videoconferencing programs, which forced them to choose the cheapest type of programs regardless of the technical requirements. This company solved the problem by starting to budget every year, and the budget for information technology grew proportionately with revenue growth. In the future, a company planning to implement videoconferencing software in this type of business is recommended to perform a cost analysis of the program and start budgeting in advance after estimating all the costs.

Expensive tools and equipment – this type of problem is described by many authors. This is a financial type of challenge faced by companies deploying videoconferencing applications. It is worth mentioning that this includes not only videoconferencing applications, but also the equipment with which those applications are used, such as computers, microphones, cameras, and so on. Although the problem is often mentioned in the literature, only one in four companies was confronted with it. The theoretical literature recommends solving this type of problem by selecting the equipment and programs according to the price-quality ratio, because costs are inevitable. This problem is also linked to the aforementioned lack of budget challenge.

- **Firm C** – this company faced a problem with expensive tools and equipment. The company says that because it had to change its business model from traditional to digital and move its lessons to the online space, they were not ready to install the right equipment to videoconferencing tools. As mentioned by the company during the interview, the equipment had to be upgraded and the necessary equipment had to be purchased additionally. The

theoretical literature suggests solving this challenge by finding the right hardware. In this case, the company solved the problem by hiring external consultants to help them purchase the right hardware on a limited budget. In the future, when a company faces this type of challenge, it is recommended to set a budget in advance and periodically update the equipment with which the videoconferencing tools will be used.

Lack of software and adaptability – this type of problem is often mentioned in the literature and described by various authors. Lack of software and adaptability This is a challenge due to the fact that a company may not always be able to find the right videoconferencing tools and adapt them to its operations. Although the program offerings on the market are large, few tools are available to provide digital education services. This is due to a lack of functionality. Theoretical analysis suggests that this type of problem should be addressed by selecting the best program that meets the highest criteria or by having the resources to program a program that meets all the requirements. Half of the surveyed companies faced this problem.

- **Firm A** – this company faced a problem of lack of software and adaptability. During the interview, the company indicated that its main problem was that the company wanted to organize large group lessons, but the program did not allow it. Their main problem was that the misunderstanding of the program limitations and encountered the problem of videoconferencing tool adaptability. In theory, it is suggested to find the most suitable program to solve these types of challenges or to create one yourself. This company coped with the challenge by contacting the suppliers of the video conferencing tool to program a solution to the problem. In the future, a company facing a similar problem is encouraged to contact company representatives to find a solution, or use other types of programs that allow barriers to be circumvented. Given the resources, it is recommended to program the most appropriate program.
- **Firm B** - this company faced a problem of lack of software and adaptability. During the interview, the company stated that its main problem was that the company did not find any suitable tools when analyzing videoconferencing software providers. In theory, it is suggested to find the most suitable program to solve these types of challenges or to create one yourself. The company solved the problem by programming its videoconferencing tool because it had the information technology department and the necessary resources. In the future, a company facing a similar problem is encouraged to contact company representatives to find a solution, or use other types of programs that allow barriers to be circumvented. Given the resources, it is recommended to program the most appropriate program.

After an empirical study and a survey of digital education companies about the challenges and solutions to their adoption of videoconferencing technology, we know that the main challenges faced by at least half of the surveyed enterprises were poor information technology knowledge, lack of process implementation skills, lack of budget and lack of software and adaptability. In order to avoid such challenges in the future, it is recommended to have an information technology specialist in the company who can help with the problems or have external consultants to help solve the problems if it is necessary. It is also recommended for companies to allocate and set a budget related to information technology. Companies are also encouraged to continually raise their employees' information technology knowledge to avoid future challenges and pay more attention to the employee's information technology knowledge during the job interview

Conclusions

1. After conducting problem analysis, it is known that videoconferencing is one of the most common and used information and communication technology tools. Its demand has grown exponentially in recent years with the global epidemic. Analysis of the problem has revealed that there are different tools, but not all of them are tailored to each area. The analysis of the problem reveals that companies face challenges in implementing videoconferencing tools.
2. A lot of different authors and scholars have described and identified external elements that have a big influence on the growth and development of small organizations. Innovation and technology it is one of the most important roles in the development, growth and success of Small and medium-sized enterprises. Based on the analyzed theoretical aspects, which determine which factors have the greatest impact on the growth and development of Small and medium-sized enterprises, it is important to emphasize that the growth of Small and medium-sized enterprises is also influenced by the technological factor, which includes information technology, which includes many components, including information and communication technology. Even though information and communications technology has been shown to save costs and enhance fundamental business operations, Apulu and Latham (2010) stress the importance of using information and communications technology in small and medium-sized enterprises.. Small and medium-sized businesses may gain a competitive edge via the effective use of information and communications technology.

As we already know, information and communication technologies have a major positive impact on small and medium-sized businesses. However, it has been mentioned in the analyzed literature that the implementation of information and communication technologies such as videoconferencing tools presents challenges. The most important factors were mentioned as support, infrastructure, experienced employees. Adoption of videoconferencing challenges are indicated as lack of human capital, lack of security, lack of infrastructure, lack of finance.

The presented solutions were also analyzed for the challenges identified in the theory. Various literature on the adoption of videoconferencing challenges distinguishes between internal and external solutions such as top management, resources end users, organizational characteristics, external and competitive pressure, information technologies solution, external information technology consultants vendors and government support. After analyzing TOE model, video conferencing tools adoption challenges and solutions the theoretical model was constructed which is presented challenges and solutions. Main challenges in adapting videoconferencing tools in small and medium-sized enterprises are low information technology infrastructure, low information technology knowledge, lack of process implementation skills, lack of budget, expensive equipment and software, low software selection and poor adaptability.

3. Qualitative research method, semi-structured interview method was chosen to conduct the research by interviewing four representatives of companies involved in the implementation of videoconferencing tools. During the interviews, the respondents provided their insights into the challenges that arose and what solution methods they used. Based on the theoretical analysis, the interviews were divided into three groups of questions. The interviews were anonymous. The interviews were recorded and transcribed in the appendices, and the data were analyzed with the MAXQDATA program.

4. The recommendations of combined theoretical and empirical results are:
- Low information technology infrastructure challenge. This challenge is related to the company's existing IT infrastructure: help in answering all questions related with technology, equipment and other IT-related work. Of the four companies surveyed, one faced this challenge. This type of challenge is recommended to be solved with the help of external consultants, who could improve the company's IT infrastructure with more knowledge.
 - Low information technology knowledge challenge. This challenge is related to the low level of information technology knowledge in every aspect of the employee. This problem is the most acute, as all the companies surveyed said they had encountered it. It is recommended to solve this problem by raising the level of information technology knowledge in the company by organizing trainings or performing appropriate tests during the recruitment process.
 - Lack of process implementation skills challenge. This challenge is due to the fact that the company's employees do not have much experience in implementing new processes such as implementing videoconferencing tools. Half of the companies involved faced this challenge. Companies facing this problem are encouraged to hire external consultants to help manage this type of process.
 - - Lack of budget challenge. This challenge is due to the fact that companies do not set a budget and face a financial shortage for information technology or, in this case, videoconferencing. Half of the companies surveyed faced this challenge. Companies facing this type of problem are advised to start budgeting for information technology as soon as possible and to update it annually.
 - - Expensive equipment and software challenge. This challenge is due to the fact that the applications to be used and the equipment with which the applications are used are expensive. Although the problem is widely described in theory, only one in four companies surveyed faced this challenge. In order to avoid this problem, it is necessary to have a budget for information technology, to have a consultant, to be able to find the best equipment at the lowest price and to update the equipment periodically.
 - Low software selection and poor adaptability challenge. This challenge is due to the fact that although there are many programs on the market, digital education companies do not have much choice in the market, and finding a suitable program faces the problem of adaptability. Half of the companies involved faced this problem. The solution to this problem is to have the most appropriate program in the market to determine what the requirements are for the program, and to find videoconferencing tools for the company itself without finding such a program.

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Appendix

4.1. Appendix 1; Firm A

1. Įmonės įsikūrimas ir veiklos sritys (įsikūrimo metai, augimo kelias, darbuotojų skaičius, veiklos sritys, paslaugų asortimentas ir pan.)

1.1. Kokia veikla užsiima Jūsų įmonė? Į kokias sritis ji orientuojasi?

1.2. Ar galite papasakoti apie įmonę? (kuo užsiima, veiklos sritys, kas jūsų klientas, kada įsikūrusi, kokias ir per kur paslaugas teikiate)

A. Iš esmės pagrindinė veikla yra papildomas ugdymas tas “tutoringas” vadinamas. Mes tokie apteikiam save kaip “Bolt” arba “Uber” žodžiu greitai, patogiai, individualiai pamokos gali vykti už valandos. Čia yra viena veiklos dalis. O antra dalis yra mokytojų mokymai. Žodžiu visi mokosi.

1.3. Į kokias sritis ji orientuojasi?

A. Orientuojamės į švietimo bei edukacijos sritis.

1.4. Kada yra įsikūrusi Jūsų įmonė?

A. Iš esmės Mokosi.lt yra transformacija iš įmonės lectorpro, kuri veikia 15 metų, o mokosi.lt buvo įregistruotas kaip prekės ženklas prieš 1,5 metų, nes keičiamas verslo modelis į digital.

1.5. Kokias paslaugas teikiate?

A. Iš esmės orientuojamės į tai kas vyksta mokyklose. T.y. visi akademiniai dalykai, bet mokyklinėje temoje. Nuo 1-12 klasės. Nedarbame su universitetais. Dirbame su studentais, bet ne su universitetais. Nebent studentai moko studentus. Mūsų platformoje galima rasti einamuosius dalykus iš mokyklos t.y. matematika, fizika, chemija, biologija. Tai nėra universitetinių dalykų.

1.6. Kas yra Jūsų klientas?

A. Mūsų klientas yra 1-12 kalsių mokiniai.

1.7. Per kur teikiate savo paslaugas?

A. Teikiame paslaugas per internetinę platformą.

1.8. Koks Jūsų augimo kelias? Ar technologijos prie to prisidėjo?

A. Prieš metus laiko mes bandėme materializuoti idėją neturėdami nieko apčiuopiamo, jokių darbų nebuvo padaryta. Tai mes pradėjom programuoti platformą naudojant “Wordpress” tam kad pasidaryti tą vadinamą MVP, kad galėtume prasitesti produktą. Su juo buvo viskas gerai. Kadangi reikia papildomų features ir srantai didėja, nes veikiame ne tik lietuvoje tai perdarinėjame, perprogramuojam tam, kad prisitaikytume. Planas yra tas produkto validavimas lietuvoje, susižiūrime kas čia darosi kas nesidaro. Tuūrime pasirašę sutartį rumunijoje ir jau ten veikiame. O paskui kitos šalys planuose. Vienareikšmiškai technologijos prisidėjo, nes esmae startuolis, o startuolis automatiškai yra inovacija plus technologija. Be technologijos mes nelabai ką galime pasiūlyti.

2. Klientų profilis (klientų segmentas, namų-užsienio, skaičius ir pan.)

2.1. Koks yra Jūsų klientų segmentas?

A. Mūsų segmentas yra mokiniai, tėvai ir mokytojai ir studentai. Tėvai priskaitomas kaip segmentas, nes dažniausiai jie užsakinėja paslaugas tad reklama būna nutaikyta ir į tėvus.

2.2. Ar veikiate tik Lietuvoje?

A. Veikiame Lietuva, Rumunija, Albanija, Azerbaidžianas.

2.3. Ar galite įvardinti preliminarų klientų skaičių?

A. Mokinių turime apie 1000

3. Technologijų naudojimas (verslo modelis - digital/traditional, konkrečių technologijų naudojamų įmonėje įvardinimas ir pan.

3.1. Koks yra Jūsų verslo modelis: digital ar traditional?

A. Jis yra digital verslo modelis. Tisklas yra automatizuoti procesą, kad būtų kuo mažesnis žmogaus įsikišimas. Ne tik kuo mažesnis būtų administracinis įsikišimas, bet kad ir klientai mažiau klaustų.

3.2. Kokias technologijas naudojate savo veikloje?

A. Pamokos pas mus dekstopinės ne telefonu vaskta. Procentas mažas kas telefonais naudojami. Planšetės, kompiuteriai taip pat naudojami. Išmanieji ekranai.

3.3. Ar be technologijų įmonė galėtų tęsti savo veiklą? Ar be ICT įmonė galėtų tęsti savo veiklą?

A. Ne.

3.4. Kaip vertinate įmonės darbuotojų technologijų supratimą? Ar darbuotojai turi technologiinį supratimą?

A. Mes turime mokytojų mokymus kaip naudotis mūsų naudojama programa unicko, nes jiems dažniausiai tai nebūna žinoma programa. Pas mus visur prašoma basic žinių apie technologijas. O daugiau kažkokių žinių nereikia. Jie veda pamoką patys kaip moka, gali ir įsivaizduoja.

4. Apie VC naudojimą

4.1. Kokiose srityse taikote VC (su klientais, tarpusavio bendravimui ir t.t.). Galbūt taikote tik skirtingose paslaugose?

A. Su visais naudojame video conferencing.

4.2. Kaip dažnai taikote VC priemones? (pvz kelis kart per dieną, kartą per dieną, kelis kart per savaitę ar kartą per savaitę?)

A. Labai dažnai. Su visais, visur bent 5 kartus per dieną.

4.3. Kada pradėjote naudoti VC priemones?

A. Nuo pat pradžių pradėjome naudoti video conferencing.

4.4. Kaip VC pakeitė jūsų darbą?

A. Pati platformos logika yra, kad nuotoliu dirbame iš esmės, tačiau pakeitė tai kad greičiau plečiamės, nes susitikimus su partneriais galime perkelti į nuotolinius susitikimus.

4.5. Ar be VC jūsų įmonė galėtų toliau tęsti savo veiklą?

A. Ne, negalėtume.

4.6. Kokias teigiamybes VC atnešė Jūsų organizacijai?

A. Leidžia vykdyti veiklą ne tik Lietuvoje – neapibrėžia fizinės vietos. Jis yra greitas ir spartus. Gali apjungti keleta žmonių, kurie nėra toje pačioje šalyje. Sutaupo daug kaštų.

5. Apie VC priemones

5.1. Kokias VC priemones taikote?

A. Mes naudojame paprasta komunikacijai Google Meets arba Zoom. O mokymo prasme naudojame Unicko.

5.2. Ar turite nusistatę biudžetą videoconferencingui?

A. Mes tam pačiam unicko mokame paper use. Žmogus mokins mums kainuoja. Mes esame susiskaičiavę užsidedam pliu 15proc. Administracinį mokestį. Tai turime nusistatę biudžetą.

5.3. Kaip vertinate įmonės darbuotojų prisitaikymą prie VC priemonių?

A. Darbuotojai sugebėjo teigiamai bei greitai prisitaikyti prie videoconferencingo priemonių.

6. Apie VC diegimą

6.1. Pagal ką atsirinkote VC priemones? (parametrus)

A. Atsirinkome pagal pritaikomumą mūsų sričiai, customer support, įmonių noras bendradarbiauti.

6.2. Apibūdinkite VC diegimo procesą įmonėje? Kokių papildomų išteklių prirėikė?

A. Viskas vyko tuo pačiu video conferencingu. Psakė ko mums reikia. Buvo pasiūlytas vienas modelis, tačiau mums netiko, tad turėjome daug diskusijų apie kaip pritaikyti. Jie keitė savo API mes savo ir taip radom geriausią sprendimo būdą bendradarbiaujant su tiekėjais ir integravome tuomet program. Tačiau tai nebuvo sudėtingas procesas. Diegimo procesas truko mėnesį. Kadangi pasidarėme integraciją prieš paleidžiant mokosi.lt todėl nekilo transformacinių iššūkių.

6.3. Įvardinkite su kokiais iššūkiais susidūrėte diegdami VC įmonėje?

A. Susidūrėme su iššūkiu, jog negalime organizuoti didesnio susitikimo. Tą meetingą didesnę galima sukurti tik per API pvz. Iki 1000 žmonių. Taip pat kildavo visokių techninių niuansų, tačiau pačioje pradžioje diegiant dar neturėjome savo IT departamento tad tekdavo kreiptis pas pačius programos diegėjus, kurie padėdavo šias kliūtis išspręsti. Galime įvardinti nedidelį niuansą tai, jog neturėjome biudžeto ir pamatėme, jog išlaidos išaugo.

6.4. Kaip sprendėte šiuos iššūkius?

A. Su įmone kontaktavome ir pritaikėme programavimo sprendimus. Taip pat pradėjome daryti mokymus savo darbuotojams. Suderinome finansinius klausimus su tiekėjais ir iš to kilo biudžetas. Po to pasikoregavome pagal poreikius, kai pamatėme, jog nusistačius biudžetą sutaupėme.

6.5. Kokias rekomendacijas suteiktumėte naujai įsikūrusiai įmonei, kuri pradės VC diegimo procesą?

A. Išsianalizuoti pasiūlą, pritaikomumo galimybes. Išsiaiškinti finansinę dalį. Patikrinti ar geras customer support tiekėjų. Pasižiūrėti rekomendacijas. Žmogiškasis faktorius vadybininkų yra labia svarbus.

7. Ar galite įvardinti sėkmės faktorius, kurie lemia sėkmingą VC taikymą jūsų įmonėje?

A. Geras programos tiekėjų customer support, žmonės, kurie turi technologines žinias bei tai jog įmonė turi IT skyrių, nes nemokame programavimo kalbos ir reikia, jog kažkas paaiškintų kaip kas veikia. Žmogus, kuris turi technologinį supratimą, kuris gali ištransliuoti užduotį paslaugų teikėjams bei padėti įmonės darbuotojams su kitais iškilusiais sunkumais naudojantis videoconferencing.

4.2. Appendix 2; Firm B

1. Apie įmonę

1.1. Kokia veikla užsiima Jūsų įmonė?

A. Mūsų įmonė užsiima nuotoliniu mokymu ir esam orientuoti į grupes. Mes teikiame geriausius mokytojus ir formuojame klases. Mes esame kaip tiltas tarp mokinio ir mokinio, bet mes renkame mokytojus, kurie turi atitikti tam tikrus kriterijus, kad galėtų pas mus mokytis.

1.2. Į kokias sritis ji orientuojasi?

A. Mes orientuojamės į 1-12 kalsių mokinius ir jų tėvelius ir teikiame papildomo ugdymo paslaugą mokiniams. Turime formalių dalykų, kurių moko mokykloje kaip lietuvių kalba, matematika fizika ir panašiai. Ir turime neformalių dalykų kaip teisės būrelis, marketingo būrelis.

1.3. Kada yra įsikūrusi Jūsų įmonė?

A. Tai mes įsikūrėme praėjusių metų rugsėjo mėnesį pradėjome mokslo metus. Ir dar metus turėjome pasiruošimo. Tai iš esmės du metus veikianti įmonė.

1.4. Kokias paslaugas teikiate?

A. Mes taikome į papildomų grupinių pamokų suteikimą.

1.5. Kas yra Jūsų klientas?

A. Mūsų klientas yra 1-12 kalsių mokiniai.

1.6. Per kur teikiate savo paslaugas?

A. Mes teikiame savo paslaugas tik online per web aplikaciją.

1.7. Koks Jūsų augimo kelias? Kas tai paskatino augimą? Ar VC prie to prisidėjo?

A. Pradėjome su pirma versija tuomet sukūrėme antrą mokymo versiją. Turbūt po vasaros bus ir trečioji versija class room. Pradėjome nuo chat pliu mokytojo vaizdas. Antroje versijoje tas pats tik prisideda papildomos funkcijos ir labai einame į videoconferencingą kur gali viename classroom dalyvauti du asmenys kuomet mokinys pakelia ranką, mokytojas jį prideda į pamoką ir tuomet mokytojas ir visi mokiniai mato jų vaizdą ir girdi ką kalba.

2. Klientų profilis (klientų segmentas, namų-užsienio, skaičius ir pan.)

2.1. Koks yra Jūsų klientų segmentas?

A. 1-12 mokiniai bei jų tėveliai, kurie gali prisijungti prie mokinio paskirios, kurioms jie galėtų turėti kontrolę.

2.2. Ar veikiate tik Lietuvoje?

A. Veikiame Lietuvoje, Graikijoje ir Ukrainos versiją turime.

2.3. Ar galite įvardinti preliminarų klientų skaičių?

A. Turime 5000 mokinių lietuvoje. Kitur skaičiaus tikslaus neturime.

3. Technologijų naudojimas (verslo modelis - digital/traditional, konkrečių technologijų naudojamų įmonėje įvardinimas ir pan.

3.1. Koks yra Jūsų verslo modelis: digital ar traditional?

A. Visiškai digital modelis. Visi mokytojai dirba remote. Niekas nėra prištas prie tradicinės vietos.

3.2. Kokias technologijas naudojate savo veikloje?

A. Turim chat su live funkcija, turime ir white board jei mokytojai juos naudoja, kuriuos out source. Turime quiz funkcionalumus.

3.3. Ar be technologijų įmonė galėtų tęsti savo veiklą? Ar be ICT įmonė galėtų tęsti savo veiklą?

A. Tikriausiai, kad ne.

3.4. Kaip vertinate įmonės darbuotojų technologijų supratimą? Ar darbuotojai turi technologiinį supratimą?

A. Žmonės dirbantys pas mus turi informacinių technologijų raštingumą tiek kiek jiems pakanka atlikti darbui. Tai priklauso nuo darbuotojo srities. O mokytojai turi raštingumą, nes yra susidūrę, nes turėjo išeiti į nuotolinį mokymą. Kadangi principas panašus tai jiems viskas kaip ir aišku.

4. Apie VC naudojimą

4.1. Kokiose srityse taikote VC (su klientais, tarpusavio bendravimui ir t.t.). Galbūt taikote tik skirtingose paslaugose?

A. Teikiant pagrindinę paslaugą tai naudojame visiškai videoconferencingą. Tarpusavyje nesinaudojam tom pačiom technologijom, tačiau naudojame kitas programas kaip zoom, google meets ir t.t. Bet dirbame per nuotolį.

4.2. Kaip dažnai taikote VC priemones? (pvz kelis kart per dieną, kartą per dieną, kelis kart per savaitę ar kartą per savaitę?)

A. Galima sakyti, kad naudojame kiekvieną dieną.

4.3. Kada pradėjote naudoti VC priemones?

A. Pradėjome videoconferencingą naudoti iškart, kai pradėjome veiklą.

4.4. Kaip VC pakeitė jūsų darbą?

A. Tai nepakeitė, nes pradėjome naudoti iš karto, nes ant to paremtas mūsų verslo modelis.

4.5. Ar be VC jūsų įmonė galėtų toliau tęsti savo veiklą?

A. Ne, negalėtų.

4.6. Kokias teigiamybes VC atnešė Jūsų organizacijai?

A. Tai davė galimybę visiškai neprisirišti prie geografinės vietos ir leisti veikti nepriklausomai nuo to kur randiesi.

5. Apie VC priemones

5.1. Kokias VC priemones taikote?

A. Mes naudojame Google Meets, Slack, Zoom, o mūsų paslauga yra mūsų sukurtas produktas kur apjungia mūsų norimas funkcijas, kuris yra suprogramuotas taip kaip mums reikia.

5.2. Ar turite nusistatę biudžetą videoconferencingui?

A. Turime biudžetą savo kaip IT sprendimui per kurį vyksta pamokos.

5.3. Kaip vertinate įmonės darbuotojų prisitaikymą prie VC priemonių?

A. Visi puikiai naudojais, moka naudotis ir didelių kėblumų nekyla.

6. Apie VC diegimą

6.1. Pagal ką atsirinkote VC priemones? (parametrus)

A. Tai būtų patikimumas, kaip patikimai veikia įrankis, toliau būtų kaina, pasižiūrėtume kiek kainuoja produktas ir trečias dalykas pasižiūrėtume ar musm užtenka funkcionalumo.

6.2. Apibūdinkite VC diegimo procesą įmonėje? Kokių papildomų išteklių prirėikė?

A. Susirandame įrankį, su kitais kolegom pasitvirtiname, kad įrankis yra tinkamas naudoti. Ir tuomet geriausiu atveju paruošiamas mokymas kaip prisijungti ir kaip naudotis programa.

6.3. Įvardinkite su kokiais iššūkiais susidūrėte diegdami VC įmonėje?

A. Techninės kliūtys kuomet kamera neveikia, mikrafonas neveikia. Taip pat mes iš rinkoje apteiktų programų negalėjome pritaikyti nei vienos sau, nes ji nebūtų atitikus mūsų keliamų reikalavimų bei poreikių.

6.4. Kaip sprendėte šiuos iššūkius?

A. Sprendimas būtų priklausomai nuo produkto, tačiau įdiegtume įrankius, kurie tuoj pat meta pranešimus kas yra negerai pvz. Su mikrafonu. Kur veda pati aplikacija spręsti problemas, o ne žmogus, kuris turi padėti išspręsti problemą. O kadangi neradome produkto rinkoje kokio mums reikia todėl videoconferencing programą susikūrėme patys

6.5. suteiktumėte naujai įsikūrusiai įmonei, kuri pradės VC diegimo procesą?

A. Pasirinkti sau patogų įrankį, pasidaryti research ir palyginti visus įrankius tarpusavyje.

7. Ar galite įvardinti sėkmės faktorius, kurie lemia sėkmingą VC taikymą jūsų įmonėje?

A. Kad visiems būtų patogų naudoti, kad visi mokėtų naudotis. Kad būtų daug automatizacijos. Sėkmės faktorius ir yra, kad sutaupto mūsų laiką.

4.3. Appendix 3; Firm C

1. Apie įmonę

1.1. Kokia veikla užsiima Jūsų įmonė?

A. Alfa klase teikia papildomo ugdymo paslaugas. Korepetitorių ir vaikų ir paauglių psichologų pamokos bei paslaugos.

1.2. Į kokias sritis ji orientuojasi?

A. Mes mokome visų pagrindinių tarpmokyklinių discipline iš, kurių mokiniai po to rašo kontrolinius arba laiko egzaminus. Taip pat konsultuojame emocių pagalba mokinius teikdami psichologines pamokas.

1.3. Kada yra įsikūrusi Jūsų įmonė?

A. 2017 metais.

1.4. Kokias paslaugas teikiate?

A. Mokyklinės disciplinos papildomo ugdymo pamokos.

1.5. Kas yra Jūsų klientas?

A. Tiesioginis klientas yra mokiniai nuo priešmokyklinukų iki dvyliktokų, bet ateina ir suaugę žmonės, kurie nori perlaikyti egzaminus, kad perstoti į kitą program ar išmokti naują kalbą. Tačiau klientais laikome ir mokinių tėvelius, nes jie nuperka paslaugą už mokinius.

1.6. Per kur teikiate savo paslaugas?

A. Gyvai, vienam iš filialų – kalsėse arba virtualiai vienoje iš populiariausių vaizdo skambučių platformų.

1.7. Koks Jūsų augimo kelias? Kas tai paskatino augimą? Ar VC prie to prisidėjo?

A. Mūsų veikla prasidėjo nuo trijų kabinetų ir buvo 3 mokytojai. Praėjus penkeriems metams turime apie 180 mokytojų 7 filialus Vilniuje bei Kaune. Kai prasidėjo karantinas mes sustabdėme veiklą, nes sakė, jog tai truks kelias savaites. Tuomet mūsų veikla sumažėjo 40proc., tačiau po kelių savaičių pradėjome tęsti savo veiklą virtualiai ir šiandien skaičiuojame, kad nuo prieš pandemijos stadijos mūsų veikla išaugo 70proc.

2. Klientų profilis (klientų segmentas, namų-užsienio, skaičius ir pan.)

2.1. Koks yra Jūsų klientų segmentas?

A. Daugiausiai 1-12 klasės mokiniai.

2.2. Ar veikiate tik Lietuvoje?

A. Taip, veikiame tik Lietuvoje.

2.3. Ar galite įvardinti preliminarų klientų skaičių?

A. Mes turime apie 1200 mokinių.

3. Technologijų naudojimas (verslo modelis - digital/traditional, konkrečių technologijų naudojamų įmonėje įvardinimas ir pan.

3.1. Koks yra Jūsų verslo modelis: digital ar traditional?

A. Tikrai yra miškus, nes mūsų pradžia buvo gyvos pamokos ir karantino deka mes perėjome į nuotolį. Mūsų trajektorija yra labiau digital.

3.2. Kokias technologijas naudojate savo veikloje?

A. Patys tie videoconferencing. O virtualiose pamokose didžiąją dalį sudaro interaktyvios lentos.

3.3. Ar be technologijų įmonė galėtų tęsti savo veiklą? Ar be ICT įmonė galėtų tęsti savo veiklą?

A. Galėtų. Galėtų mokiniai ateiti į klasę, naudoti paprastą lentą.

3.4. Kaip vertinate įmonės darbuotojų technologijų supratimą? Ar darbuotojai turi technologiinį supratimą?

A. Mūsų darbuotojų kompiuterinis raštingumas aukštas, nes dirbame su jaunais žmonėmis. Mes sandome žmones, kurie jau per darbo pokalbį pademonstruoja savo kompiuterinį raštingumą.

4. Apie VC naudojimą

4.1. Kokiose srityse taikote VC (su klientais, tarpusavio bendravimui ir t.t.). Galbūt taikote tik skirtingose ?

A. Didžioji dalis yra bendrauti su klientu t.y. vesti pamokas. Kadangi aš pati asmeniškai dirbut su atrankomis, aš naudoju videoconferencing darbo pokalbiams. Tiek pirmo etapo metu kuomet mes susipažįstame su kandidatu tiek antrojo etapo metu kuomet jei veda demo pamoką ir laiko žinių patikrinimo testą ir viską esame pasidarę online būtent dėl karantino. Taip pat naudojame videoconferencingą tarp kolegų dėl to, kad mes veikiame per du miestus Vilniuje ir Kaune.

4.2. Kaip dažnai taikote VC priemones? (pvz kelis kart per dieną, kartą per dieną, kelis kart per savaitę ar kartą per savaitę?)

A. Kiekvieną dieną.

4.3. Kada pradėjote naudoti VC priemones?

A. 2019m.

4.4. Kaip VC pakeitė jūsų darbą?

A. Paspartinio darbą, sumažino atstumą ir sutaupoma išteklių.

4.5. Ar be VC jūsų įmonė galėtų toliau tęsti savo veiklą?

A. Galėtų, tačiau sunkiau, nes jau esame pripratę naudoti videoconferencing.

4.6. Kokias teigiamybes VC atnešė Jūsų organizacijai?

A. Tai visų pirma mums leido išsiplėsti geografiškai. Nes prieš videoconferencing mūsų klientas buvo didmiesčio mokiniai. Kai pradėjo naudoti šiuos įrankius pradėjome įgyti naujų klientų iš mažesnių miestelių ar užsienio. Atsirado daugiau interaktyvumo mūsų pamokose. O administracijas palengvino verslo procesus, taupo laiką bei išteklius.

5. Apie VC priemones

5.1. Kokias VC priemones taikote?

A. Google Meets administracija, Zoom naudoja mokytojai, Teams, Skype.

5.2. Ar turite nusistatę biudžetą videoconferencingui?

A. Ne, nes mes naudojames nemokamomis priemonėmis, nes musm jų pakanka.

5.3. Kaip vertinate įmonės darbuotojų prisitaikymą prie VC priemonių?

A. Puikiai vertinu.

6. Apie VC diegimą

6.1. Pagal ką atsirinkote VC priemones? (parametrus)

A. Pagal žinomiausią platformas ir pagal kainą. Ir pagal patogumą, pagal funkcionalumą pritaikomumą. Mokytojai atmetė Teams, nes jie strigdavo ir jau buvo integruotas whiteboard. Plius galėdavai matyti mokinius atlikdamas kitas funkcijas.

6.2. Apibūdinkite VC diegimo procesą įmonėje? Kokių papildomų išteklių prirėikė?

A. Diegimo proceso metu buvo didžiausiu prašymai būtent tvarkingai susivesti informaciją: susikurti vartotoją, kokius logotipus įsikelti, kokius aprašus padaryti, jog mokiniai mus atpažintų.

6.3. Įvardinkite su kokiais iššūkiais susidūrėte diegdami VC įmonėje?

A. Mokinys ir mokytojas nesugebėdavo sklandžiai pasidalinti skambučio nuoroda: pamiršdavo nusiųsti pakvietimą, nusiųsdavo ne tam ir t.t. Taip pat pačioje pradžioje kai tik pradėjome keltis į online veiklą ne visi turėjome nešiojamus kompiuterius, tad reikėjo pasirūpinti kameromis bei mikrafonais, o kai kurią techniką teko atnaujinti – tai turi savo kainą. Taip pat neturėdami procesų pakeitimų buvo sunku adaptuotis prie permainų vis tik labiau koncentruojamės į mokymą.

6.4. Kaip sprendėte šiuos iššūkius?

A. Sprendėme, nes kiekviena klaida sumažindavo mūsų paslaugos kokybę. Todėl įsivedėme klientų aptarnavimo specialistus, kuriems paskambinama ir sakoma mum turi vykti pamoka ir mes neturim nuorodos. Tad pasikartojančius atvejus sprendėm padarydami specialius mokymus arba pasikalbėdami asmeniškai. Pasisamdėme išorinius konsultantus kurie kainos bei kokybės santykiu patarė okių įrangą pirkti, jog galėtume prisitaikyti videconferencing. Su tais pačiais IT konsultantais išsprendėme ir IT infrastruktūros klausimą. Dabar šiuos konsultantus samdome outsource principu. Pasisamdėme išorinius konsultantus kurie patarė kokią aparatūrą pirkti, kad ji būtų kokybiška ir nebrangi.

6.5. Kokias rekomendacijas suteiktumėte naujai įsikūrusiai įmonei, kuri pradės VC diegimo procesą?

A. Nustatyti testavimo laikotarpį, kiek įmanoma automatizuoti administracinį darbą, kad kiltų kuo mažiau žmogiškųjų problem.

7. Ar galite įvardinti sėkmės faktorius, kurie lemia sėkmingą VC taikymą jūsų įmonėje?

A. Tiekėjų atsirinkimas, kurie atitinka reikalavimus ir išsikeltus tikslus, techninis žmogus, kuris gali padėti išspręsti iškilusias problemas.

4.4. Appendix 4; Firm D

1. Apie įmonę

1.1. Kokia veikla užsiima Jūsų įmonė?

A. Mūsų įmonė užsiima papildomu mokymu 5-12 klasėje dėstomų dalykų.

1.2. Į kokias sritis ji orientuojasi?

A. Orientuojamės į visas mokykloje dėstomas disciplinas. Taip pat prisitaikome prie naujų pradedamų mokytų dalykų tokių kaip marketingas.

1.3. Kada yra įsikūrusi Jūsų įmonė?

A. Mūsų įmonė įsikūrusi 2020m.

1.4. Kokias paslaugas teikiate?

A. Teikiame papildomo ugdymo paslaugas.

1.5. Kas yra Jūsų klientas?

A. Mūsų klientas yra vidurinių ir gimnazijos klasių mokiniai.

1.6. Per kur teikiate savo paslaugas?

A. Mes savo paslaugas teikiame nuotoliniu būdu.

1.7. Koks Jūsų augimo kelias? Kas tai paskatino augimą? Ar VC prie to prisidėjo?

A. Mūsų įmonė įsikūrė kabinetuke. Nuo ten pradėjome savo veiklą. Šiandien dienai išaugome iki kelių kabinetų ofiso, kuriuose mokytojai gali atlikti savo paslaugas.

2. Klientų profilis (klientų segmentas, namų-užsienio, skaičius ir pan.)

2.1. Koks yra Jūsų klientų segmentas?

A. Mūsų klientų segmentas yra 1-12 kalsės mokiniai.

2.2. Ar veikiate tik Lietuvoje?

A. Taip, mes veikiame tik Lietuvoje.

2.3. Ar galite įvardinti preliminarų klientų skaičių?

A. Šiuo metu mes turime 1400 klientų

3. Technologijų naudojimas (verslo modelis - digital/traditional, konkrečių technologijų naudojamų įmonėje įvardinimas ir pan.)

3.1. Koks yra Jūsų verslo modelis: digital ar traditional?

A. Sakyčiau, kad mūsų verslo modelis yra tik digital. Mes jau nebeturime kažkokių didelių sąsajų su traditional verslu.

3.2. Kokias technologijas naudojate savo veikloje?

A. Mes naudojame turbūt visas ryšio priemones tokias kaip aišku kompiuteriai mobilūs telefonai. Aišku naudojame ir white boardus. Žinoma yra įvairių kitų programų ir aplikacijų, kuriuos naudojame savo kasdienėje veikloje.

3.3. Ar be technologijų įmonė galėtų tęsti savo veiklą? Ar be ICT įmonė galėtų tęsti savo veiklą?

A. Mūsų įmonė negalėtų tęsti veiklos be technologijų, kadangi kaip ir minėjau mes jau nuo pat pradžių vykdome savo veiklą elektroninėje erdvėje.

3.4. Kaip vertinate įmonės darbuotojų technologijų supratimą? Ar darbuotojai turi technologinį supratimą?

A. Mūsų įmonės technologinis supratimas tikrai geras. Mūsų įmonėje pasirenka dirbti jauni mokytojai, kurie dažniausiai turi technologinį raštingumą.

4. Apie VC naudojimą

4.1. Kokiose srityse taikote VC (su klientais, tarpusavio bendravimui ir t.t.). Galbūt taikote tik skirtingose paslaugose?

A. Videocounferencing taikome tiek bendravime su klientais tiek tarpusavio bendradarbiavimui.

4.2. Kaip dažnai taikote VC priemones? (pvz kelis kart per dieną, kartą per dieną, kelis kart per savaitę ar kartą per savaitę?)

A. Kiekvieną dieną, po kelis kartus vienareikšmiškai.

4.3. Kada pradėjote naudoti VC priemones?

A. Videoconferencing priemones naudoti iš pat pradžių kai įsisteigėme.

4.4. Kaip VC pakeitė jūsų darbą?

A. Naudojant videoconferencing pagreitėjo sprendimų priėmimas, pradėjome taupyti kaštus eliminuojant pokalbių kambarius.

4.5. Ar be VC jūsų įmonė galėtų toliau tęsti savo veiklą?

A. Be videoconferencing mūsų įmonė negalėtų tęsti veiklos

4.6. Kokias teigiamybes VC atnešė Jūsų organizacijai?

A. Pradėjome taupyti ir greičiau atliekame užduotis.

5. Apie VC priemonės

5.1. Kokias VC priemones taikote?

A. Pagrindė naudojame Zoom bei Teams priemones tiek vidiniai komunikacijai tiek vedant pamokas mokiniams.

5.2. Ar turite nusistatę biudžetą videoconferencingui?

A. Konkretaus biudžeto neturime, nes naudojame nemokamas programas tik susimokėdami už papildomus įrankius.

5.3. Kaip vertinate įmonės darbuotojų prisitaikymą prie VC priemonių?

A. Mūsų įmonės darbuotojai puikiai prisitaikė prie diegiamų priemonių. Turbūt dėl to, jog visos yra gerai pažįstamos.

6. Apie VC diegimą

6.1. Pagal ką atsirinkote VC priemones? (parametrus)

A. Dabartinė mūsų veikimo sistema nereikalauja didelio funkcionalumo todėl atsižvelgėme į kainą, tačiau taip pat lemiantysis faktorius buvo ir naudojimo paprastumas.

6.2. Apibūdinkite VC diegimo procesą įmonėje? Kokių papildomų išteklių prireikė?

A. Taigi, galime sakyti, jog pirmoji stadija buvo program atsirinkimas, jų funkcijų išanalizavimas. Atsirinkę programas išanalizavome kokie yra apribojimai ir kokių funkcijų reikia įsigyti papildomai. Tuomet nustatėme programos susiformavimo minimalius reikalavimus, kad profilis atitiktų įmonės

standartą. Galiausiai sukūrėme trumpus video mokymus apie tai kaip naudoti visas reikiamas funkcijas bei kaip susidoroti su kasdieniais, paprastais iškilusiais sunkumais.

6.3. Įvardinkite su kokiais iššūkiais susidūrėte diegdami VC įmonėje?

A. Didžiausias iššūkis ir buvo tai, jog kai kurie darbuotojai nežinojo kaip susidoroti su tais iškilusiais paprastais sunkumais. Biudžetas buvo ribotas, todėl reikėjo rinktis kuo pigesnę program variantą, o ko pasekoje susidūrėme su pigesnėmis programomis, nes jų pasiūla mažesnė. Žinoma nežinojimas kaip diegti visa IT infrastruktūra taip pat buvo dalis problem – tinkamai neišanalizavome visos programinės įrangos su kuria ketiname dirbti

6.4. Kaip sprendėte šiuos iššūkius?

A. Kaip ir minėjau sukūrėme trumpus mokomuosius video. Pradėjome kiekvienais metais formuoti biudžetą ir augant pajamoms didiname ir su visa IT infrastruktūra susijusį biudžetą. Natūraliai augant biudžetui galime leisti geresnes videoconferencing programas. Pasisamdėme išorinius IT konsultantus, kurie padėjo sukoordinuoti visa diegimo procesą.

6.5. Kokias rekomendacijas suteiktumėte naujai įsikūrusiai įmonei, kuri pradės VC diegimo procesą?

A. Na turbūt labiausiai norėčiau patarti prieš diegiant atlikti tinkamą program analizę ir išsikelti tikslus ko būtent bus reikalaujama iš tų program, tuomet bus žinoma pagal kokius kriterijus pasirinkinėti.

7. Ar galite įvardinti sėkmės faktorius, kurie lemia sėkmingą VC taikymą jūsų įmonėje?

A. Pagrindinis sėkmės faktorius ir būtų tikslų išsikėlimas bei žinojimas kokias programas diegiame. Na galbūt pridurčiau, kad techninis aptarnavimas labia pasitarnavo viso diegimo procese.