MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
UKRAINIAN-AMERICAN CONCORDIA UNIVERSITY

School of Management and Business
Department of International Economic Relations, Business & Management

Bachelor's Qualification Work

_____IT management in a non-IT company_____

(Based on SPEAK ONLINE case)

Bachelor's student of 4th year study
Field of Study 07 – Management and Administration
Specialty 073 – Management
Educ. program – IT Management

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Research supervisor **Selezniova R.V.**

Ph.D. in Computer Science

(signature)

Kyiv – 2023

Abstract

It defines the concepts of IT management and IT company and details what processes must be taken to incorporate them into real business. This study summarizes the theoretical approach to the emergence of the concept of management, how it led to IT management, and what role IT management plays in modern society and the economy. In particular, it explained what processes should be taken to realize IT management in small and medium-sized enterprises, and detailed the contents and processes of research using actual company data and conditions. Through SWOT analysis & matrix, IT environment analysis, and CSF/CIR analysis, specific goals, strategies, and appropriate technical requirements for solving problems were identified. It summarizes the steps necessary to newly introduce the company's IT management, concludes the minimum conditions and suggestions based on the research results, and provides a procedure for introducing IT management applicable to any business.

Keywords: Information Technology, IT company, SME Informatization, IT environment, Management system.

Анотація

Він визначає концепції IT-менеджменту та IT-компанії та детально описує, які процеси необхідно виконати, щоб включити їх у реальний бізнес. У цьому дослідженні узагальнено теоретичний підхід до виникнення концепції менеджменту, як це призвело до IT-менеджменту та яку роль IT-менеджмент відіграє в сучасному суспільстві та економіці. Зокрема, було пояснено, які процеси необхідно застосувати для впровадження IT-менеджменту на малих і середніх підприємствах, а також детально описано зміст і процеси дослідження з використанням фактичних даних і умов компанії. За допомогою аналізу та матриці SWOT, аналізу IT-середовища та аналізу CSF/CIR було визначено конкретні цілі, стратегії та відповідні технічні вимоги для вирішення проблем. Він узагальнює кроки, необхідні для нового впровадження IT-менеджменту компанії, підсумовує мінімальні умови та пропозиції на основі результатів дослідження, а також забезпечує процедуру впровадження IT-менеджменту, застосовного до будь-якого бізнесу.

Ключові слова: Інформаційні технології, IT-компанія, Інформатизація МСП, IT-середовище, Система менеджменту.

PHEE-institute «Ukrainian-American Concordia University»

School of Management and Business
Department of International Economic Relations, Business and Management

Educational level: **bachelor degree**
Specialty: 073 "Management"
Educational Program "IT Management"

APPROVED
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TASK
FOR BACHELOR'S QUALIFICATION WORK

_____Wonmi Yu_____
(Name, Surname)

1. Topic of the work: IT management in a non-IT company

(based on SPEAK ONLINE case)

Supervisor of the work ***Ruslana Seleznova, Ph.D. in Technical Science***.
(surname, name, degree, academic rank)
Which approved by Order of University from
"22" September 2022 № 22-09/2022-4c - **MIT**

2. Deadline for bachelor's qualification work submission "***23" April 2023***
3. Data-out to the bachelor's qualification work_
Materials from internship received during consultation with representatives of the company. Information from open resources in the Internet, official reporting of financial and economic activities of the enterprise.

4. Contents of the explanatory note (list of issues to be developed).

There are three main topics a student should develop in this work:

1. ***The background and concept of it management and case study of it management in non-it companies***
2. ***Analysis of the "speak online" and opportunities and potential through development of it management***

3. ***Ways of enhancement the productivity of "speak Online" through it management improvement***

5. List of graphic material (with exact indication of any mandatory drawings)

Graphs and figures for analysis of economical and statistical information on the company and its development, visualization of mechanism of development, etc.

6. Consultants for parts of the work

Part of the project	Surname, name, position	Signature	
		Given	Accepted
1	*Ruslana Seleznova, Ph.D. in Technical Science*		
2	*Ruslana Seleznova, Ph.D. in Technical Science*		
3	*Ruslana Seleznova, Ph.D. in Technical Science*		

7. Date of issue of the assignment

Time Schedule

№	The title of the parts of the bachelor's qualification work	Deadlines	Notes
1.	I chapter	*31.12.2022*	*In time*
2.	II chapter	*20.02.2023*	*In time*
3.	III chapter	*11.04.2023*	*In time*
4.	Introduction, conclusions, summary	*23.04.2023*	*In time*
5.	Pre-defense	*27.04.2023*	*In time*

Student Wonmi Yu_____
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Supervisor *Ruslana Seleznova*_____
(signature)

Conclusions:

The paper examines the development of theoretical approaches to IT management as well as how globalization dynamics in electronic commerce have contributed to the rise of IT management. The helpful advice was well-crafted and focused on the job's main goal and responsibilities. If the defense is successful, the thesis can be characterized as "excellent" in general.

Supervisor *Ruslana Seleznova*_____

(signature)

CONTENT

INTRODUCTION

In the beginning, after the planet Earth was born, there are many natural elements that existed to form an important factor of its substance. For example, air, sunlight, water, and land are such things. Among them, new creatures appeared one by one, and the first humans, who can be called our ancestors, were one of them. They naturally integrated in the environment of nature and began to live as a member of an ecosystem. Creativity, it was difference from other lives with humans who were latecomers as residents of the space of the Earth. Through its creativity, new civilization and culture are created, and it continues to be the cornerstone of creating a new era.

In this 21st century, there is one more thing of the environments which is always surrounding us like air. That is 'Information Technology' and it is commonly called to 'IT' in an abbreviated form nowadays. Information technology is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data. Typically, IT is used in the context of business operations, as opposed to technology used for personal or entertainment purposes. The commercial use of IT encompasses both computer technology and telecommunications.

The Harvard Business Review coined the term information technology to make a distinction between purpose-built machines designed to perform a limited scope of functions, and general-purpose computing machines that could be programmed for various tasks. (Castagna, 2021) IT has such a comprehensive and broad meaning.

Modern IT is the result of continuous development, convergence, and connection of things such as hardware, software, the Internet, networks etc. From modern to contemporary times, Information Technology gradually went through a process of popularizing and commercializing and the field has taken on an essential role in the overall market economy because it has been required by all businesses and industries to cover their information and communications. This was the process of the emergence of the IT industry, and this remarkable

technological revolution gave an explosive synergy to the global economy, setting the stage for a new era. It is called "Third Industrial Revolution or Digital revolution".[1]

People were enthusiastic about the IT products provided by the market and the various information they get from them. At first, only some high classes or developed places enjoyed it like a privilege, but as time went by, the objectives are gradually expanded. Approaching the end of the twentieth century, societies all over the world started to change. In countries of many different kinds information now played an increasingly important part in economic, social, cultural and political life. This phenomenon took place regardless of a country's size, state of development or political philosophy. Changes that were happening in Singapore, with a population of 2.5 million, were similar to those taking place in Japan with its population of 125 million. Developing countries like Thailand were striving to build information-intensive social and economic systems just as hard as countries like the United Kingdom or France. (moore, 1997) Eventually, we entered the 21st century with development of information and technology which is called the "Information age".[2]

IT, the best masterpiece of human creation, is inseparable with global market process as well as entire human life now. It is undeniable fact that IT exist everywhere and humankind in the modern society have become beings who need the power of modern technology. If the human race in the beginning needed light and air, the new human race is pursuing an ease in their living environment and infinite development by adding IT to it.

All of this seems to have been achieved was a series of research, development, and creation. The remarkable development shown since the advent of IT can be seen as the result of the greatest creation in the shortest time in human history. But modern technology experts didn't

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[1] It began in the late 1900s and is characterized by the spread of automation and digitization through the use of electronics and computers, the invention of the Internet, and the discovery of nuclear energy. This era witnessed the rise of electronics like never before, from computers to new technologies that enable the automation of industrial processes. Advancements in telecommunications led the way for widespread globalization, which in turn enabled industries to offshore production to low-cost economies and radicalize business models worldwide.
*Ward, K. (2019, 02 18). *Timeline of revolutions*. Retrieved from Manufacturing data summit: https://manufacturingdata.io/newsroom/timeline-of-revolutions/

[2] A period in human history characterized by the shift from traditional industry that the industrial revolution brought through industrialization, to an economy based on the information computerization.
*Mehmet Durnali, İ. L. (2020). *Enriching Teaching and Learning Environments With Contemporary Technologies.* Turkey: IGI Global.

stop and still are working for the next step and it is the reason that a new era is coming in just a few decades.

In the latest revolution, everything we use will show qualitative improvement connected based on the internet. Since many processes will be digitized and automated, full analog methods that have nothing to do with IT will become increasingly difficult to see. Nevertheless, the remaining non-digitalized people, data and processes will be either they remain valued in the name of tradition or they regress due to lack of innovation and ability. So, in the capitalist world where the new industrial revolution took place, IT will be the standard for determining the values of individuals, companies, and countries, and furthermore, success and failure. IT is no longer an option. People will ask for it for granted, but on the contrary, people will also be asked for it by society. Therefore, it is not allowed the people who want to survive in the coming wave of the Fourth Industrial Revolution[3] to disregard the necessity of information and communication technology.

For the opening page, it is written that to compare the environment of the first humanity and modern humanity and introduced the IT environment created by people in 20th century. IT, which is melted in our lives like air, has brought a new high-tech era through incessant development, and it has also been emphasized that IT has become a very essential element for these days.

The aim of this bachelor thesis work is to find out how this important IT was used in the past and is being used in the business sector now, to analyze what discriminatory results it exhibits compared to before it was applied to the actual business 'SPEAK ONLINE' company, to discuss the benefits and efficiency of IT technology and management capabilities to the business according to the results.

In order to achieve this aim, the following steps were set**:**

- Defining of IT management based on history and theory;
- Learning how IT management works in SME development;

[3] Fourth Industrial Revolution is building on the Third, the digital revolution and it is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.

*Schwab, K. (2016, 01 14). *The Fourth Industrial Revolution: what it means, how to respond*. Retrieved from World Economic Forum: https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

- Researching the cases and results of IT management in non-IT company;
- Providing data as an example of non-IT company by completing an internship at “SPEAK ONLINE” and analyzing its strategies and competitiveness;
- Conducting research into understanding how does it apply information technology to enterprises and such IT management can help to further improve business development;
- Finding out more practical suggestions to apply in actual company “SPEAK ONLINE”.

CHAPTER 1. THE BACKGROUND AND CONCEPT OF IT MANAGEMENT AND CASE STUDY OF IT MANAGEMENT IN NON-IT COMPANIES

1.1 Understanding of IT management and IT company

1) Background information of the emergence of IT management and IT company

Today, the business environment is rapidly changing along with the technology and market environment. The development of technologies related company management such as manufacturing, logistics, sales, services, and communication is remarkable. Meanwhile, consumer demands are diversifying and the market is expanding not only domestically but also internationally.

Among the changes in the management condition surrounding companies, one that directly or indirectly will affect future organizational management is the change in information technology. In addition, if economic structure complexity and corporate globalization played a role in the development of information technology, there is a close interaction or feedback relationship between factors such as the development of information technology, the complexity of decision-making environment, and the increase in demand in the cyclical and developmental relationship, the innovation for information. and utilization of information technology are accelerating.

In this situation, in order for each company to maintain its competitive advantage, expectations are rising that it will value speed in all management activities and reform the business process with information technology as a means of confrontation. The main purpose of the current corporate innovation regardless of the industry is to shorten the process time in the organization, such as the time it takes to supply products to the market or the time it takes to receive orders and provide products.[4]

Information technology is a powerful method of making it possible. The ability to respond to IT promotes the use of IT in various corporate management situations, and at

[4] Benjamin, R. a. (1992). Critical IT Issues : The Next Ten Years. *Magazine Summer*, 7-9

the same time, such a cycle is occurring that accelerates the change in the business environment that must be responded to.[5]

2) Definition of IT management and corporate informatization

- Advance of the cocept of management

When considering business management to achieve organizational goals while adapting to external environmental changes, corporate organizations are viewed as a system. The system is usually prone to classification as a hierarchical component. Generally, management is classified into strategic planning, business management, and performance management.[6]

Strategic planning is the process of determining policies on organizational goals, changes in goals, use of resources to achieve goals, and resource management.[7]

Business management is the process by which management confirms the acquisition and effective or efficient use of resources to achieve organizational goals.

Performance management is a process of confirming that individual tasks are being executed effectively or efficiently.

Anthony (1965) said strategic planning became important because "the changes in the environment around the company, such as technological innovation, the influx of low-growth economies and intensifying competition between companies, or the development of internationalization of business activities, gather steam so it is an important issue for companies to clarify the relationship between environmental factors." He mentioned that these three processes are consist of a hierarchy with strategic planning at the top and performance management at the bottom, and the

[5] Castagna, R. (2021, 08). *What is Information Technology? Definition and Examples*. Retrieved from Techtarget: https://www.techtarget.com/searchdatacenter/definition/IT

[6] Eunyoung, P. H. (2008). *Do business with IT.* Seoul: Sagom (Hanyang University Press).

[7] Karimi, J. (1988). Strategic Planning for Information Systems:: Requirements and Information Engineering Methods. *Journal of Management Information Systems*, 4(4):5-24.

hierarchy is formed according to the importance of various dimensions - time, organizational level, information, and criticality of decision.

Ansoff (1965) differed in the classification and view of Anthony's management process. From the viewpoint of classification of the level of decision-making, it is classified as ① strategic decision-making on the choice of producing product mixes and selling market by an entity, ② managerial decision-making on organizing the entity's resources, ③ business decision making for optimizing the transition of resources in the enterprise.

In addition, **Simon** (1965) classified decision-making into two categories from the perspective that the number of responses to the continuous occurrence of problems that require decision-making. It is a problem that occurs repeatedly, a formal decision-making that clearly sets the procedure for solving it and a strange problem, an unstructured decision-making that cannot set the procedure for solving it in advance.

Furthermore, it was **Gorry and Morton** (1989) who presented a framework as a management information system for companies by combining the classification of management processes by Anthony and the classification of decision-making by Simon. They changed Simon's political and unstructured decision-making to structural and unstructured decision-making, respectively, and classified the form of decision-making into three categories, considering the category of semi-structural decision-making. By developing this configuration, Gorry and Morton advocated the concept of Decision Support Systems (DDS).[8]

- Transition of management information system theory

In the late 1960s, the management information system began with the goal of providing all management managers with the necessary information. In other words, it is a step to use for data processing for individual management such as sales

[8] Chunsung Lim, G. J. (2020). *Creative IT Management Theory in the Era of the Fourth Industrial Revolution.* Seoul: Chungram.

management, process management, inventory management, material management, and budget management. In other words, from the mechanization of office work in the first stage, the management information system for the individual management system was aimed. In addition, research on management information systems (MIS) was rapidly declining due to technical limitations at the time and lack of understanding of how information systems contribute to corporate management. The initial purpose of introducing management systems to companies was computer automation. Most of the application fields were cantered on transaction processing such as financial and accounting work of companies that are relatively easy to automate and information processing in the task management stage. At the same time, it expanded to other fields such as manufacturing, purchasing, and sales, but failed to satisfy the information requirements in management. In other words, it did not become a management information system for actual management managers. In addition, the term management information system is used, but it is often used to refer to the control of information systems used in management, including decision support systems. It was never the same as the original meaning of the management information system.

Therefore, in the background of the development of information processing technology, responding to information requirements for management and a manager support system that emphasizes the concept of <support> for manager. Representative of them is the DDS proposed by Gorry and Scott Morton and the Executive Support System (ESS) by Rockart & Delong (1988).

As is well known, the Strategic Information System (SIS) has been a major boom since the end of 1980. This is remarkably different from the conventional information system and has a direct relationship with the company's management strategy.

The conventional systems of MIS, DSS, and ESS are mainly introverted information systems within the organization to establish a management foundation aimed at pursuing management efficiency. On the other hand, SIS is an extroverted information system aimed at maintaining a competitive advantage over competitors in society. SIS is a kind of management mechanism, and its contents are a system that operates MIS

or a system cantered on transaction processing (TBIS). SIS is a concept that is always identified as a lump with the management entity that uses the system, and does not have detailed characteristics as an information system.

- IT management and corporate informatization in modern times

It can be said that it is to support the work of companies using IT technology and increase management efficiency. Another more reduced expression is corporate informatization. It has already been said that it is used in various expressions such as e-business and digital management depending on the situation of the times.

There are several systems and solutions that support corporate informatization, and the state in which these are well used for corporate management by introducing them is called "IT management." In other words, corporate informatization, which is not well used in actual management, is meaningless.

Then, what does corporate informatization mean? It refers to efficiently managing and sharing information produced from all or any management activities of a company. To this end, all information must be digitized and managed using advanced IT technology and Internet technology. Expanding corporate informatization further without simply grasping it in a means means means efficiently managing and sharing information. To this end, it is necessary to digitize all information using advanced IT technology and Internet technology. If corporate informatization is expanded further without simply grasping it as a means, it can be said to increase management efficiency by efficiently managing and sharing information. When that happens, it is truly said that it is 'managing with IT'.

To explain more about corporate informatization (IT management), in fact, corporate information is meaningless in itself. Information has power in the process of being transmitted from the producer to the consumer of information. This is called 'data flow'. When promoting corporate informatization, the flow of such data should be clarified. It should be well defined which process the information will flow to. In order for information to have power, the information system serves as a means of

communication that can organically deliver data flow between information producers and consumers. Production, sales, marketing, management of a company.All information or data present in the support activity may be useful as information in itself. However, in the process of optimizing information used for management activities through the integration, appropriate combination, relocation, and delivery of calculated information, the reinvention of information is called 'corporate informatization'.[9]

Information that is valuable in the past or present tends to be delivered only to the minority. Those who received and inherited information often played a role as the dominant class, which is a socially superior status. There were many such cases within a company, but now the development of the Internet and digital technology has made it easier to process and deliver information, enabling information for all corporate members. This is the foundation for strengthening corporate capabilities. For companies, the value of information is very important, and it is a core asset of corporate management. Since the corporate management environment is always uncertain and rapidly changing, corporate management must be flexible, rapid, and accurate. For this, it is essential to quickly obtain and analyze abundant and accurate information and apply it to corporate management.

3) Distinguishing criterion of IT company and non-IT company

IT companies primarily deal with the development, maintenance, and implementation of computer systems, software, and networks. Non-IT companies, on the other hand, are companies that do not primarily focus on technology-related products or services. And there are various differences according to a variety of category.

- Products or Services: IT companies generally provide technology-related products or services such as software development, web development, cloud services, networking, and cybersecurity. Non-IT companies offer products or services in

[9] Kang, B. (2005). *Information Technology and Windows.* Seoul: Samyoungsa.

various fields such as finance, healthcare, education, manufacturing, retail, and many others.

- Employee Profiles: IT companies often hire IT professionals such as programmers, software engineers, network engineers, and IT support staff, while non-IT companies hire employees with expertise in various fields such as marketing, finance, human resources, and operations.
- Market Capitalization: IT companies tend to have higher market capitalization compared to non-IT companies. This is because the technology sector is considered to have high growth potential, and IT companies are often associated with high-profit margins and scalability.

4) Regulations regarding Information Technology and IT management

As such, IT offers great convenience and has changed the lifestyle of the universal people. However, in inverse proportion to its convenience, makeup by him is also becoming frequent. This is because in general, legal disputes related to IT cannot be solved by existing legal theories, or it is not easy to find related precedents. This is because a wide range of issues are being discussed, ranging from which country's law should be judged on the Internet without borders, to how individual privacy should be protected on the Internet.

Currently, countries around the world continue to revise and revise related laws to solve these issues, and courts in each country are redefining their rulings in line with this trend. In the United States, where the Internet began to explode in the late 1990s, various laws related to IT have been enacted and considerable rulings have been accumulated. Thus, in the United States, legal fields called "Internet Law," "Cyberspace Law," and "IT Law" are recognized as solid independent laws.[10]

The European Union also enacts a number of IT-related guidelines for the development and dissemination of information technology and consumer protection, and strives to

[10] Sam-hyun, J. (2003). *A Study on IT Legislations and Cases in U.S. and EU.* Sungshil University.

make the enacted laws domestic within its member states and EU partners. In addition, precedents in domestic courts of major member countries and partner countries such as Germany, France, the Netherlands, Austria, and Switzerland, as well as precedents of the European Court of Justice, have been accumulated and exchanged with each other.[11]

Korea's representative IT-related cyber laws include the trade secret protection system, the Personal Information Protection Act, and the Computer Program Protection Act. The trade secret protection system is a system that protects trade secrets held by companies by law and imposes civil or criminal punishment under the Unfair Competition Prevention and Trade Secret Protection Act (abbreviated as the Unfair Competition Prevention Act). Trade secrets protected by this system are technical secrets such as design methods, design plans, experimental data, manufacturing technologies, etc., and customer management secrets such as customer lists, sales plans, and office management methods.

In addition, the Personal Information Protection Act aims to promote the rights and interests of the people by protecting privacy from the collection, leakage, misuse, and abuse of personal information, and further to prescribe matters related to personal information processing to realize individual dignity and value. Here, personal information refers to information about a living individual that can be recognized through names, resident registration numbers, and videos (including information that can be easily recognized in combination with other information even if the information alone cannot recognize a specific individual).

The Computer Program Protection Act is a type of copyright law that aims to "contribute to the sound development of the national economy by protecting the rights of authors of computer program works, promoting fair use of programs, and promoting program-related industries and technologies." It stipulates program copyright, program registration, regulation on infringement of rights, program deliberation and coordination committee, entrustment of authority, relations with other laws, and penalties, respectively.

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[11] moore, N. (1997). Issues and trends: the information society. In Y. L. Courrier, *World information report* (pp. 271-284). London: Unesco.

In this way, laws and systems related to IT technology are in place, but there are still many cases in which venture companies, small businesses, and individuals are damaged due to indifference and ignorance.

1.2 Framework of IT management for Small-Medium sized Enterprises

1) Direction and expected effects of IT Management for Small-Medium sized Enterprises

- Direction

IT management starts with basic informatization. In other words, the general direction of IT management is to establish a digital management environment based on basic information technology, and to introduce IT management system that can promote strategic decision-making and e-business based on this.

The process of introducing the IT management system is as follows.

① Building the system and network and infrastructure expansion such as education, and digital culture formation. ② Online system construction ③ Online business development ④ Business system integration ⑤ Business maturation, and e-business optimization.

- Effects

Establishing a digital management system requires a lot of cost and effort. Such investment for digital management necessarily brings corresponding results. First, the introduction of digital management makes small and medium-sized enterprises more efficient in handling their work. Direct effects are expected throughout the business process, such as improving business processing capabilities and innovating customer services. In addition, digital management is expected to have additional effects such as enhancing the external image of a company, cultivating rational mindsets, standardization within the company, and management innovation.

In general, if SME[12]s is fully equipped with a digital management system, it is expected that they will be able to secure world-class business competitiveness by securing digital management innovation and competitive advantage through efficiency of work processing and effective and strategic use of information.

2) Steps for strategic approach of IT management Framework in SME

The introduction of the IT management system of SMEs cannot be easily carried out for various reasons, so a framework to promote it more systematically is required. If SMEs aim to achieve a strategic vision of securing global competitive advantage, they should develop strategies for training human resources, establish IT management systems, and establish digital management infrastructure, establish strategic plans, and use external support.

The first thing to secure before mobilizing these means and methods is the formation of an IT management culture and the spread of an IT management mind. This requires a strategy to spread the public sector, but only when executives and employees actively participate in external seminars, workshops, and forums and make strategic efforts within the company. A strategic approach to promoting a systematic framework can be proposed as follows.

First, it is a phased strategy. Unlike large companies, small and medium-sized enterprises also lack basic infrastructure to implement IT management such as communication networks. In addition, due to the lack of internal management resources such as funds, manpower, and technology, the conditions for establishing a long-term information service plan or IT management promotion plan are often insufficient, so short-term plans are often relied on. Therefore, unlike large companies, SMEs need a step-by-step method, and specifically, it is desirable to approach the core system construction stage such as network construction stage, information exchange environment construction stage, and IT management stage.

[12] SME is the short form of “Small-Medium sized Enterprises”

Second, it is a strategy centered on investment efficiency. Since IT management promotion has the characteristic that it is difficult to expect visible effects in the short term, a strategic approach centered on efficiency rather than effect is desirable for small and medium-sized enterprises. The promotion of informatization to implement digital management costs a lot of investment, but SMEs have limited investment capacity due to lack of funds. Another approach to achieving investment efficiency is to minimize initial investment costs. Therefore, it is necessary to apply the use of outsourcing, for example, ASP (Application Service Provider), rather than establishing and implementing informatization and IT management plans on its own. Outsourcing of informatization includes purchasing software to efficiently handle various tasks such as salary, accounting, materials, production, and sales, and requesting external professional companies to develop software or build information systems. In addition, an alternative can be to use information service programs for work using ASP, which recently borrows programs through network networks such as the Internet. In addition, since the establishment of a network is a key infrastructure, it should be approached to improve the investment efficiency of SMEs by inducing cost reduction based on policy support such as investment cost assistance to network providers.[13]

Third, establishing a network between SMEs. Of course, it may be difficult to establish a detailed plan in the absence of infrastructure technology for network construction or small and medium-sized business partners, but implementing IT management It is necessary to include the establishment of networks between small and medium-sized enterprises when establishing an information service plan for the purpose.

Fourth, it is necessary to promote a leading strategy through fostering excellent small and medium-sized enterprises in digital management in the government or public institutions. One of the tasks to be overcome to revitalize digital management of

[13] Lee, G. (2006). *IT Management Innovation and Information Cost Management.* Seoul: Seoul Economic Management.

SMEs is the lack of mind of CEOs of SMEs and the lack of confidence in the effect of information service investment. If there are many successful cases of small and medium-sized companies in the same industry, it can be seen that a considerable number of areas can be solved by activating benchmarking of excellent companies.

Finally, it is necessary to establish a service-oriented support infrastructure system to revitalize the introduction of digital management. The digital mind and information technology of executives and employees, including CEOs of small and medium-sized companies, are not improved in a short period of time, but are improved by continuous education and consulting. In addition, even if ASP is promoted as part of outsourcing to improve investment efficiency, if there is a lack of professionals in small and medium-sized companies, the utilization of information systems may decrease, resulting in lower investment efficiency. In addition, consulting for successful digital management should be accompanied when considering the various characteristics and promotion conditions of SMEs and the lack of in-house professionals in the final stage of IT management construction of IT management.

1.3 Cases and results of IT management in non-IT industries

Case 1: Eco-Friendly pigsty and hog feeding and management based on u-IT information systems[14]

There are cases of individual feeding systems for sow and the sow sorters which are the subparts of an eco-friendly feeding and management system based on a u-IT program using the hog feeding and management information system.

Eco-friendly hog feeding and management programs utilizing u-IT technology have passed the pilot project stage and are now in the commercialization stage. An analysis of technical issues and economic effects was conducted in some cases; however, it has not been proven that it deserves investment in the long-term viewpoint despite the initial cost.

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[14] PICCA. (2001). *A Case Study on the Management of IT Small and Medium Venture Businesses2001.* Seoul: PICCA.

As a result of case analysis, the introduction of the individual feeding system for sows can expect a profit of 15,768,000 won per year with an operation of 100 sows as the standard. The break-even point was determined to be 2.8 years. The introduction of the market pig sorter can expect profits of 7,920,000 won per year with the shipping of 1,800 heads as the standard, and the break-even point examined to be 1.9 years

In this connection, the introduction of eco-friendly feeding and management systems using the u-IT can achieve profits in the long-term despite the burden of investment cost in the short term, and can expect additional effects including the improvement of the pigsty environment, the strengthening of the immunity level in pigs, and the reduction of labor cost. Hence, farmers need to consider the introduction of this latest system. Government must also support businesses by examining the effects, compatibility, and economic feasibility of a variety of eco-friendly feeding and management technologies using u-IT technology in order to improve the Korean hog raising industry.

Case 2: An example of a smart work introduction company using ICT and management in combination

Company B is a public corporation whose main tasks are multi-purpose dam management, water and sewerage construction, and management. The main projects are construction and management of water resource facilities, construction and management of water and sewage, and the creation of industrial complexes and new cities.

Company B has promoted smart work around the Information Management Office since October 2010, when the smart craze was blowing, and has been selected as an excellent case of smart work operation and has won a number of awards. At first, a mobile office with a foundation for information and communication technology was established, and smart work was conducted around smart work centers, and now employees are working on how to use smart devices well. Every year, smart work is continuously promoted under the themes of "smart management," "creating a good workplace," and "improving the quality of life."

The achievements of smart work were diverse. K, who responded to the interview, was not able to clearly present the economic achievements achieved by the organization, such as productivity, because he was the deputy director of the Computer Management Agency. However, I heard that the time for overtime has decreased a lot due to the change in organizational culture. As a result of measuring the satisfaction index and overtime time recently, it was found that the satisfaction level increased and the overtime time decreased. The overtime time was measured by the system's login and logout time.

In the case of Company B, which introduced smart work in the early stages and is actively using it, flexibility and autonomy in performing work could be secured, but the total amount of work itself did not decrease. In the case of Company B, after the introduction of smart work, a culture has been formed in which employees can leave work at 7 p.m. without noticing. The interviewer's answer adequately explains this situation.

"The smart work never reduced my workload. Instead, one advantage is that I have the flexibility to spend time and space doing my job, and I'm satisfied with it."

In other words, as a result, smart work did not reduce work. Smart work needs to be approached in terms of flexibility that each employee can flexibly use the space or time to work in the company.

Case 3: Strategic Use of Information Systems by Walmart

Let's look at the case of Walmart, which has grown through strategic use of information technology. Founded in 1965 by Sam Walton in Newport, Arizona, Walmart's success is driven by an effective combination of management ideology, management strategy, and information technology. As a latecomer in the retail industry, it was able to enjoy continuous growth by properly linking management strategies and information technology to realize low margins, which is a major issue in the distribution industry. Wal-Mart, which continued to grow at a high rate of 20 percent since then, posted 82.5 billion dollars in sales at the end of 1994, more than double the 35 billion dollars of its rival Kmart.

Walmart's management philosophy states, "Our company exists to provide value to our customers. It makes customers' lives rich by providing low prices and high-quality services.

Everything else is secondary." This is based on a firm perception that the essence of retail success lies in "coming customers" and that the key factor in success lies in low prices and high-quality services. This management ideology firmly instilled in all organizational members the perception that customers are the best, and allowed them to focus their energy on activities that realize low-priced and high-quality services.

Based on this management ideology, Wal-Mart used the Everyday Low-Price strategy and customer-friendly strategy. The Everyday Low-Price strategy was realized as a low-cost strategy and a low-margin strategy. In terms of operating expenses to sales, Wal-Mart is lower than its major competitor, Kmart (16% of Wal-Mart, 22.2% of Kmart), and advertising costs are also low in the industry at 0.49% of sales. By combining these low-cost and low-margin rates, the value of customers has been increased and this has been embodied as a core competency of Wal-Mart. Based on this low-priced strategy, Wal-Mart has developed its business centered on small cities. At that time, large-scale retailers were crowded with Wal-Mart's competitors, and it was a disadvantageous environment to realize low prices. Therefore, villages with a population of less than 5,000 were selected, customer-friendly strategies were implemented to take control of the entire small city, and based on this, the pattern of entering large cities was used.

Wal-Mart's management philosophy and strategy, which met the resistance of several small cities calling for "Stop the WAL" in the early 1990s, were realized with the introduction of proper information technology. As with most advanced companies, Wal-Mart also aimed to strengthen customer service by realizing low prices and preventing early store sales by improving efficiency and reducing costs throughout the distribution process, which in turn led to maximizing sales and profits. There are many types of information technology introduced by Wal-Mart. First of all, early technologies used include barcode systems and EDI[15]. The employment of barcodes has led to the acceleration of incoming and outgoing operations and the efficiency of inventory management in Wal-Mart distribution centers

[15] Electronic Data Interchange (EDI) is the computer-to-computer exchange of business documents in a standard electronic format between business partners.
*EDI basics. (2023, 4 25). *What is EDI (Electronic Data Interchange)?* Retrieved from EDI basics: https://www.edibasics.com/what-is-edi/

and stores, which in turn led to the improvement of customer service. In addition, by establishing EDI in its network, it has provided an opportunity to start two-way communication in real time rather than unilateral data transmission so far. Furthermore, by allowing suppliers with transaction relations to adopt EDI, it ultimately resulted in improving the overall supply-related business process. In the end, this information technology enabled QR[16] (Quick Response), a more advanced system, and served as an opportunity to put Wal-Mart's information system on a full-fledged track.

The next successful information technology for Wal-Mart is the use of satellite communication systems. It was built with the aim of better communication between Walmart headquarters and all distribution centers and stores, and thus reducing costs. There are three main effects of establishing an intelligent logistics network using satellite communication. First, transmission costs and efficient communication connections with local stores resulted in 20-30% reduction in in-house communication costs due to faster transaction-related data transmission and accuracy. Second, sales techniques and product manuals can be introduced to stores by the vehicle location tracking system.

Wal-Mart provides store sales data online to major trading companies that have adopted EDI. This allows traders to establish appropriate procurement and production plans and eventually reduce costs by eliminating unnecessary inventory and losses. Through this product supply system with trading companies, Wal-Mart has a system that receives the actual amount sold at each store from the supplier without having inventory in its distribution center and supplies the right amount to the store in a timely manner through the distribution center.

Wal-Mart realized that the only way to implement management ideology and management strategy was to use externally oriented information technology, and first began internal system integration with the aim of integrating the entire supply and demand system surrounding the company. A few years later, Walmart integrated its systems and suppliers, and more recently, it is attempting to integrate its customers into the company's processes

[16] Quick response is a method that enables retailers or manufacturers to share their inventory needs almost in real-time.

and systems. To this end, Wal-Mart has built a data warehouse and RetailLink, a client/server application, giving suppliers direct access to Wal-Mart data warehouses. Data Warehouse stores transactions by store, product, and supplier over the past 52 weeks, with a capacity of 7.5TB. The data warehouse is connected via satellite to servers located in each of Walmart's stores, and servers are again connected to POS machines and portable wireless computers in multiple stores. Users can get information on what products are on the move, what products are needed for each store, and what the current inventory status is through RetailLink.

Recently, Wal-Mart operates an Internet service called Wal-Mart Online to integrate into the demand chain. The website provides information about the product and allows the product to be delivered as soon as the customer pays. The system is connected to Walmart's information system and can also obtain information about customers. James Martin, an authority on information engineering, explains in his book Cyber Enterprise that inter-business networks and inter-business computing will fundamentally change the pattern of transactions. In other words, if the process and information flow of suppliers and customers are not linked to that of the organization, the organization will not be able to keep up with the change and will inevitably fall behind. In addition to Wal-Mart, advanced companies are trying to become leaders in a new era by accurately judging and responding to these business changes.

CHAPTER 2. ANALYSIS OF THE "SPEAK ONLINE" AND OPPORTUNITIES AND POTENTIAL THROUGH DEVELOPMENT OF IT MANAGEMENT

2.1 General information and research of "SPEAK ONLINE"

1) Company's establishment background

Speak Online is established in 2020, when the all of the people were fighting with economic crisis and lockdown caused by Covid-19.[17] Before the establishment of the online platform company, the beginning was a vacation English camp for Korean students hosted by Peace School. Peace School signed an agreement with the Korean NGO, Multicultural Welfare Center [18]and hired English teachers with skills and experience to carry out the project several times in Kiev, Ukraine. However, when the COVID-19 pandemic[19] makes it difficult to proceed with the project, Speak Online is created as a solution and expansion for a new business.

2) Organizational and Business structure of SPEAK ONLINE

Organizational structure generally refers that the distributions, along various line, of people among social positions that influence the role relations among these people.[20] and Speak Online is defined according to the type of organizational structure as follows.

- Centralized structure with hierarchy

[17] Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus.
[18] The multicultural General Welfare Center is a corporation that provides welfare programs and cultural activities for multicultural families and teenagers in Korea.
[19] COVID-19 pandemic has created an unprecedented and wide-ranging economic crisis for the entire global economy. As of 2020, an economic crisis has occurred in 92.9% of the world. This is larger than 40.9% during the smallpox pandemic in the 1870s and 83.3% during the Great Depression in the 20th century. As such, the COVID-19 pandemic economic crisis is the most widespread economic crisis since the global economic crisis occurred in 1871, which was a strong economic crisis that occurred after the first global economic crisis in 1857.
[20] Blau, P. M. (1974). *On the nature of organization.* Wiley.

There is a hierarchy consists of positions differentiate with particular responsibility and in Speak Online. But the power of authority is not so strong and strict compared with other centralized business entities. And communication between top manager and general employee is accessible. Also, significant business agenda is discussed in management body and senior managers but except that, it can be discussed with a large number of employees regardless of their positions.

- Geographical structure and business structure

The firm has Korean branch and Ukrainian branch. Due to the attack by Russia, most of Korean workers had to go back to their countries and it leads a new division by location. Although Ukrainian workers are not in Ukraine because they have fled to other countries, it is named 'Ukrainian branch' regardless of their different country of residence.

Business structure is legal form of a company which is determined by what legal nature and liability it has. Speak Online is a sole proprietor company. But the management takes the form of entrusted management, not the owner actually manages it. The owner, the consignor, pays a certain amount to the trustee, and the trustee operates the company under the delegation of overall management rights to the consignor.

3) Mission and Vision of SPEAK ONLINE

Mission is "*Anyone can learn language with joy and reasonable price. We are willing to share our ability, time and love for you*".
Vision is *"Not only to be an online English education platform in Korea and Ukraine, but also to become a global education platform that connects countries to those who want to give education and those who want to be educated."* [21]

[21] Speak Online. (2020). *Introduction of company*. Retrieved from Speak online: http://kspeakon.com/intro.php

For now, Speak Online started for English education company but it is for the foundation to build online matching platform connecting learners and instructors.

4) Specialization of SPEAK ONLINE

Speak Online is specialized in English speaking education for begineers to middle-level students in Korea. and there are three points of Korean English education trend which is considered for customer targeting and company specialization. In Korea, speaking-oriented English education facilities are out of ordinary, and there is a barrier to entry into English speaking education because there is a concept that people with a high level of education, such as gifted students and international schools, usually get. In that sense, English conversation education facilities were considered challenging projects. In addtion, there are three points of Korean English education trend which is considered for customer targeting and company specialization.

- English education market is continuously growing

Changes of private English education expenditures by school level

(2017 - 2021)

Unit: a hundred million won (₩)

Period	Total	Elementary school	Middle school	High school
2017	54,250	21,354	17,383	15,513
2018	56,729	22,894	17,856	15,979
2019	61,381	25,797	18,859	16,725
2020	59,908	22,951	19,413	17,544
2021	71,396	30,837	22,550	18,010

Source: Statistics Korea, Private Education Expenditures Survey

Fig.2.1 Private English education expenditures by school level

English has long been regarded as one of the most important subjects for Korean students and accordingly, the market for private education in English continues to increase.[22]

It is a table describing the expenditures for English private education in Korea for last 5 years. Overall, it can be seen that private English education expenditure has steadily increased every year, and in particular, in 2021, English private education expenditure for elementary school students increased sharply by about 34% compared to the previous year. (Korea, 2022) The figures show that the interest in early English education for elementary school students has increased significantly. **Also, it means that the demand for English education among Starter or Beginner-level students has soared.**

- Public education still hasn't come up with a solution to improve English

It was found that Koreans' English speaking level remained at the bottom of the world. Korea ranked 122nd out of 168 countries in the world based on TOEFL[23] scores. On the other hand, reading ability was ranked 22nd and top. In terms of Korean TOEFL scores by area, △ reading 22 points △ listening 21 points △ speaking 20 points △ writing 21 points, which was lower than the global average (reading 19.2 points, listening 21 points, speaking 21.6 points, and writing 20.5 points).[24]

Number of English education experts already have pointed out such a deficiency of Korean English education system. It is true that there were changes in teaching method of public education, such as English textbooks focusing practical English more and participating a native teacher's class, after several revisions to the

[22] Korea, S. (2022, 03 11). Total private Education Expenditures by School Level. Korea.
lawdavinchi. (n.d.). *IT-related cyber laws*. Retrieved from Lawdavinchi: https://www.lawdavinci.com/sub03/view.php?depth1=3&depth2=2&id=20

[23] The TOEFL (Test of English as a Foreign Language) is a standardized academic English test primarily taken by students applying to universities in the United States or others.
*EF. (2022). *TOFLE*. Retrieved from EF: https://www.ef.com/ca/english-tests/toefl/

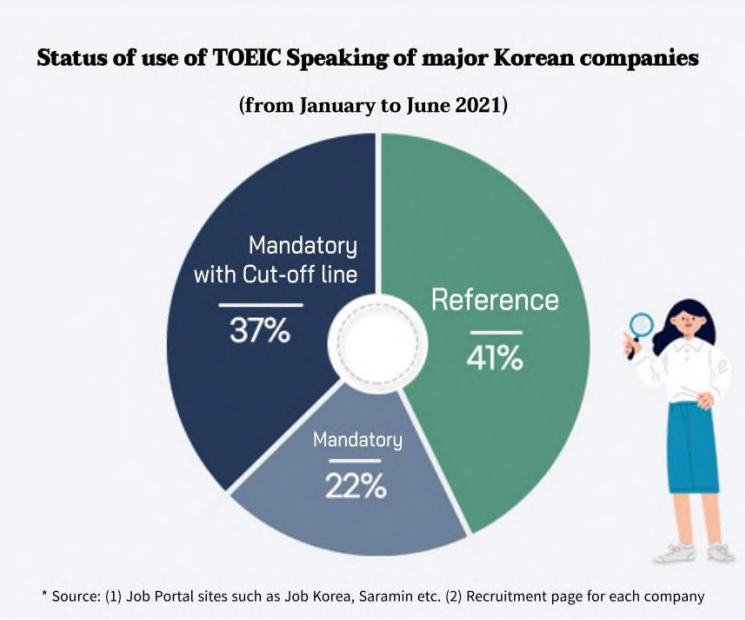
[24] Hyun, S. (2019, 06 24). *Korean English level..."Reading" ranked 22nd and "Speaking" ranked 122nd*. Retrieved from Aju business daily: https://www.ajunews.com/view/20190624083552757

curriculum, but **the level of English speaking in Korea is still hovering at the bottom.**

Due to the burden test related to the college entrance examination called the College Scholastic Ability Test, English education in the field is flowing to "writing-oriented" education as the school level rises. In other words, even if play-oriented and communication-oriented learning and process-oriented evaluation were conducted in elementary school, problem-solving and quantitative evaluation with more emphasis on grammatical accuracy and functionality than English learning with practical skills considering students' interests and abilities are emphasized.[25]

Likethis, English education in Korean schools is still mainly aimed at calculating school grades or entering college, so the evaluation of speaking performance is relatively neglected.[26]

- Significance for English speaking skills is increasing



[25] WON, H.-J. K.-H. (2019, 8 31). Search for Improvement of English Education System to Enhance. *Fisheries and Marine Education Research*, pp. 31(4),.

[26] Park, S.-Y., & Min, C.-K. (2018). A Comparative Study on Teachers and Students Perception of Middle School English Speaking Performance Assessment. *Korean Association For Learner-Centered Curriculum And Instruction*, (pp. 18(24), 847-866.).

Fig 2.2 Current status of major domestic companies' use of TOEIC Speaking by YBM

Despite the limitations of improving English speaking ability in public education in middle and high schools, the official English speaking test is considered an important means of employment more and more. And it is expected further arouse Korean students' desire to improve their English speaking skills and following consumption of education. The graph below is an analysis about current status of major Korean companies' use of TOEIC Speaking.[27]

As a result of analyzing 509 employment announcements of major destic companies announced from January to June 2021, about 480 recruitments include TOEIC speaking scores in terms of employment conditions. The outcome of survay is organized the ratio by dividing it into 'Reference[28]', 'Mandatory[29]', and ' Mandatory with Cut-off line' according to the contents of use, "Reference" was the highest at 41%, followed by "Mandatory with Cut-off line[30] (37%)" and "Mandatory (22%)." [31]

It suggests how big needs of the enterprises in Korea looking for employees with English speaking skills have. But Korean learners who are accustomed to reading-based English learning do not have much information on English speaking education activities and exams, especially those preparing for speaking tests complain of anxiety.[32]

5) Categories of commercial activity and the result

There are three main categories of financial activity in SPEAK ONLINE.

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[27] *TOEIC*® Speaking tests assess English-language skills that are used in daily life and the workplace.
*ETS. (2022). *Content and Format of the TOEIC® Speaking and Writing Tests*. Retrieved from ETS TOEIC: https://www.ets.org/toeic/test-takers/speaking-writing/about/content-format/

[28] In case the company require submission only the relevant person / preferential treatment or additional points are given when applicant submit the result / the blank for grades are included in the job application form.

[29] In case that applicant must submit the result but not be required a certain score.

[30] In case that applicant must submit the result with a certain standard score or higher.

[31] YBM The Korean TOEIC Comittee. (2021, 09). *In the first half of 2021, what is the English grade of new employees that major domestic companies wanted?* Retrieved from YBM The Korean TOEIC Comittee News letter: https://exam.ybmnet.co.kr/newsletter/view.asp?naid=230&pageno=

[32] Lee., I. (2020, 04). The Study of Perception of Teachers and Students About English Speaking Education and Evaluation. *The Journal of Humanities and Social science 11(2)*, pp. 373-387.

First, Online English education supporting children of multicultural family

Based on the cooperative relationship that the company built for the English camp before Speak Online, The Multicultural General Welfare Center accepted to make partnership. The Multicultural General Welfare Center promote and recruit applicants for the 6-months online English education program course of SPEAK ONLINE semiannually. And SPEAK ONLINE pays a certain fee in return for being provided customers from The Multicultural General Welfare Center. This partnership began since 2020 and has been underway for fifth sessions. In addition, discussions on the resumption of English camp programs in Europe are also actively taking place as regulations due to COVID-19 are disappearing.

Second, Online English education targeting general customers

Generally, educational service products are priced according to the period (1/3/6/12 months), frequency (2,3,4,5 times a week), and time (20, 30, 40, 60 minutes), and additional discounts are provided as the period is longer. There is not any differences between education program supporting multi-cultural family. Unfortunately, **no case has yet occurred in which general customers flow in through other channels.**

Third, Overseas study agency activities for existing customers

A promotion of Ukraine's long/short-term study abroad program was conducted for existing customers, and as a result, several participants were recruited. In addition, a partnership project in the form of providing customers to Sun Culture Center in Ukraine for a commission was under reviewed and progressed, but it is now an impossible activity due to the outbreak of the Russian-Ukrainian war. While, there is still a great possibility and potential that can proceed again after the war situation.

As the result, the following provides data on SPEAK ONLINE's main comercia activity performance, the online English education supporting children of multicultural family. Changes in the number of students and changes in the number of students classified according to age are shown in tables and graphs.

period / factors	2020	2021		2022	
	2nd half	1st half	2nd half	1st half	2nd half
Total	102	155	122	100	102
Existing student	-	48	61	46	41
New student	102	107	61	54	61
Rate of retaking	47.058	39.354	37.704	41	-

Fig 2.3 Number of students in Speak Online (from 2020 to 2022) Table

period / age	20-2nd half		21-1st half		21-2nd half		22-1st half		22-2nd half	
	number	rate	number	rate	number	rate	number	rate	number	rate
Total	102		155		122		100		102	
Elementary	/		/		/		21	21	22	21.568
Middle	47	46.078	71	45.806	61	50	40	40	31	30.392
High	29	28.431	41	26.451	29	23.770	10	10	16	15.686
Adult	26	25.49	43	27.741	33	27.049	29	29	33	32.352

Fig 2.4 Customers categorized by age in Speak Online (from2020 to2022) Table

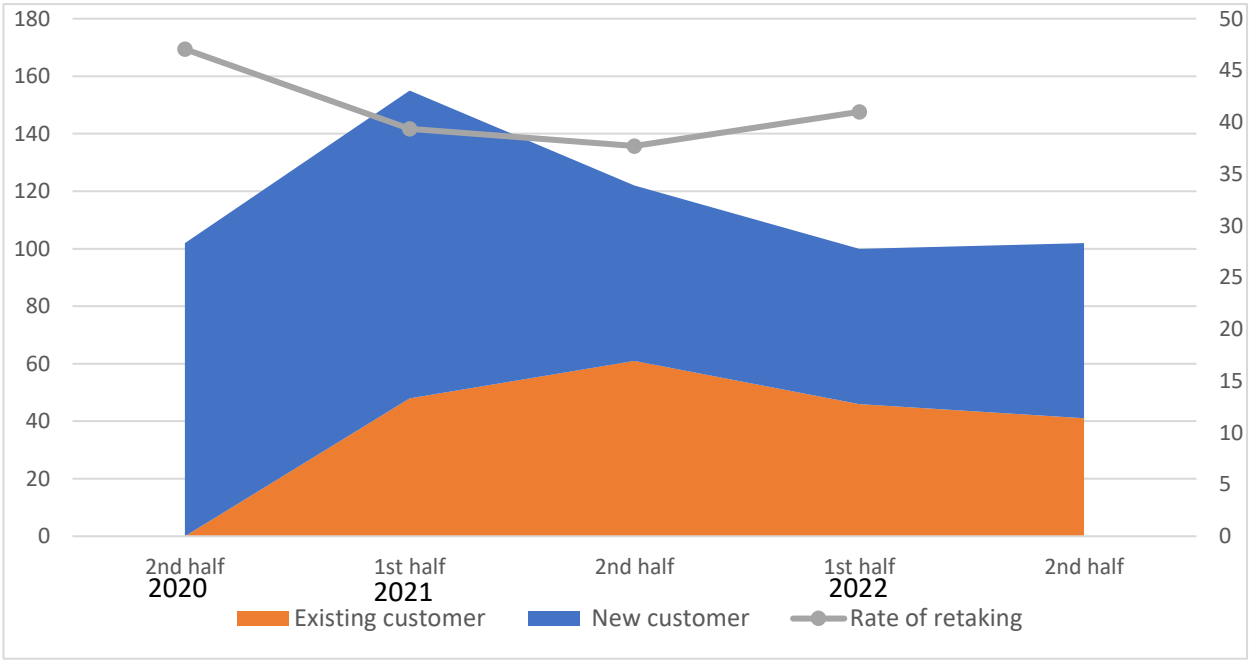

Fig 2.5 Number of students in Speak Online (from 2020 to 2022) Graph

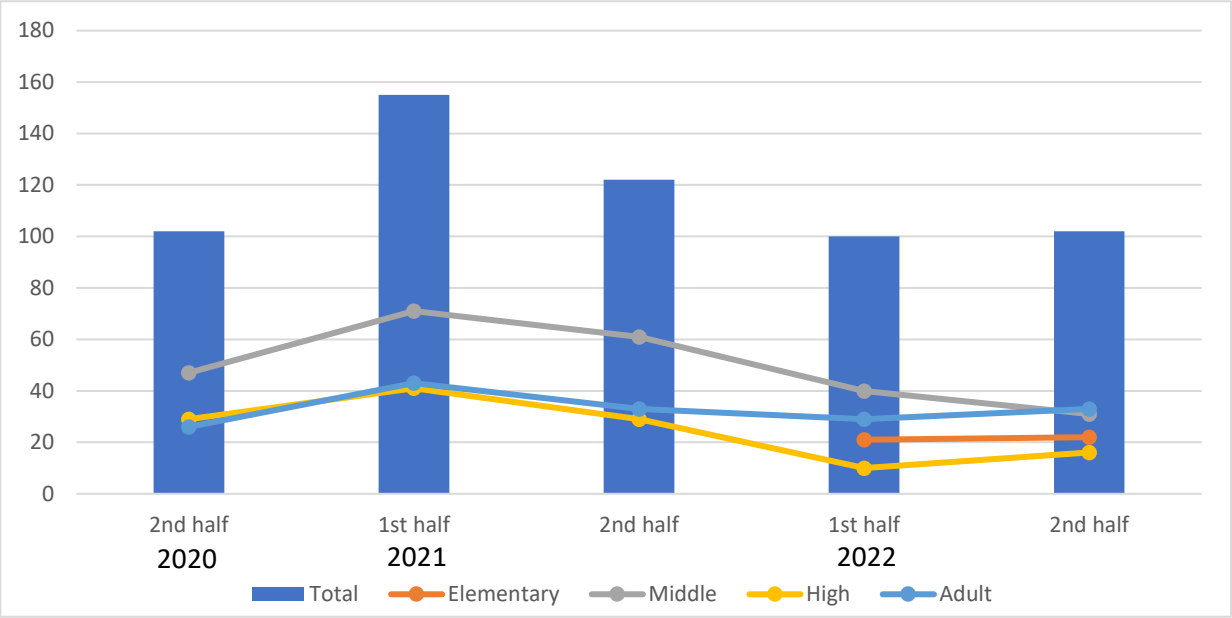

Fig 2.6 customers categorized by age in Speak Online (from2020 to2022) Graph

Except for the first half of 2021, the number of new students is not more than 50% of the total. Looking at the decline in the total number of students and the number of new students, it can be seen that the inflow has already been limited. The proportion of students who wished to retake the course among all students remained on the decline, but rose again in the first half of 2022. It seems necessary to find out which parts have improved compared to before.

The most noticeable thing about the customer classification is that elementary school students have been included since 2022. Elementary school students make up a fairly large percentage, about 20 percent of all students. On the contrary, middle and high school students, especially middle school students, continued to decline, while high school students increased in the first half of 2022. Interestingly, the proportion of adults did not change significantly even after elementary school students were included.

The fact that the number of middle school students, which accounted for about 50% of all students before elementary school students, is gradually decreasing can be interpreted as meaning that the rate of retaking of middle school students is not high. It is assumed that the reason for this is that middle school students have the most difficulty in teaching with native English teachers.

In conclusion, it can be said that there is a need for a change in the teaching method aimed at middle school students. And as an alternative to increase the retake rate, it can be suggested to build a strategy targeting inflow of new elementary school students.

2.2 Internal structure of “SPEAK ONLINE” and SWOT analysis & matrix

1) Operational structure

Business operations are all activities that a company performs to grow in value and make more money. This includes production processes as well as managing finances and resources. A company's business operations are adjusted generating a profit for the business's proprietors and shareholders. Employees contribute to the business operations by performing specific tasks that is assigned for each of them. And these roles could be in various area like marketing, sales, production and so on.

There are differences in the operations processes of businesses offering goods and businesses offering services. In case of the businesses who produce and sell goods, everything in the process of making those goods, from receiving the raw materials to the final output, is part of the business operations. Whatever it takes to produce a final product is counted as a business operation—even cleaning the factory afterward. Services differ slightly from goods as they are intangible goods offered by a business. However, the principle remains the same. Everything that is involved with providing the service to customers is part of the business process.[33]

Regardless of how the company makes a profit, every business needs to set-up their own operational procedures to maintain a reliable business process. A prime model is the creation of an operational manual with instructions for each activity of the labour. For example, operating procedures for creating a product include ordering materials and consumables, scheduling tasks, and maintaining equipment. All of these tasks are necessary for the company to generate revenue, and all employees

[33] StudySmarter. (n.d.). *Business Operations*. Retrieved from StudySmarter: https://www.studysmarter.co.uk/explanations/business-studies/business-operations/

involved in the process must understand how the production process works. Like this, operational structure is focused on “how” employees handle their work.

Organizational structure is often used as a synonym of operational system. The two concepts are related but it is distinguished in that it focuses on "who" such as staff assignments to handle specific functions, assign supervisory roles and tasks, and create cross-departmental communications. And there are explanation and diagram about operational structure of “SPEAK ONLINE” as follows.[34]

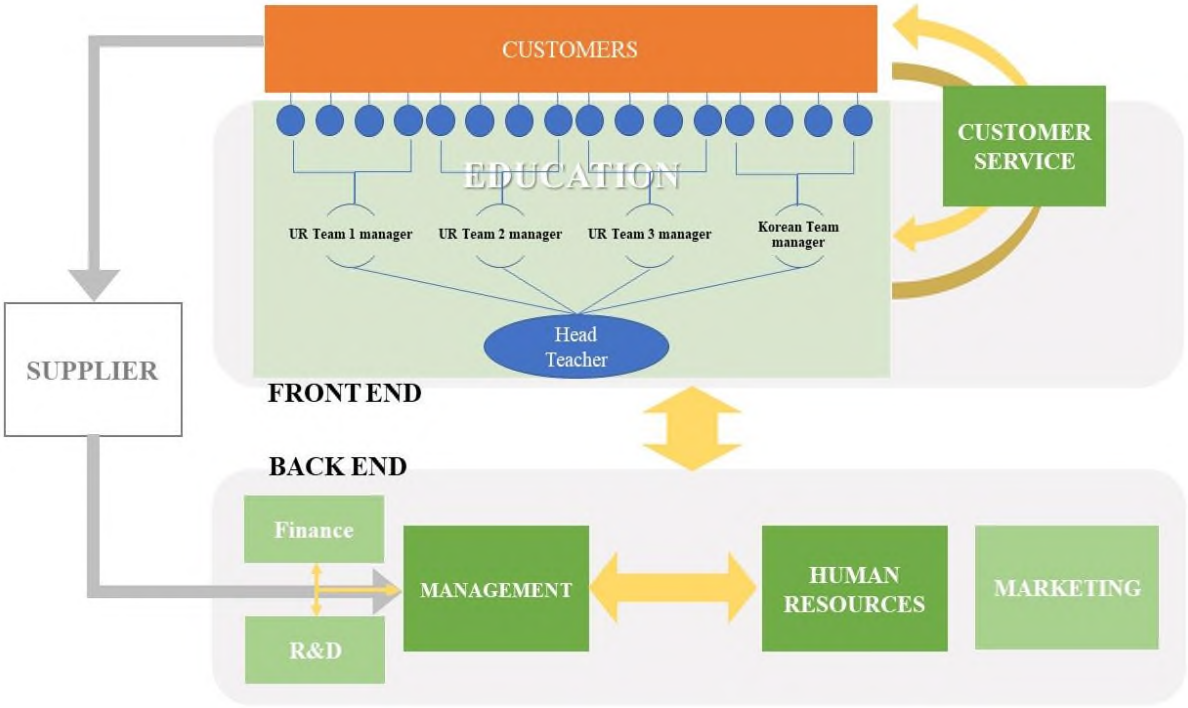

Fig 2.7 SPEAK ONLINE business operation system

Speak Online business operation is running with front-end and back-end interaction. It is defined that the part which has a responsibility to face and provide service directly to customers is front-end while the part which focus on general operational process of the company and provide service indirectly to customers is back-end. The front-end includes Education and Customer service departments and especially, . The back-end includes Management and HR department as a central organ including subsidiary departments like Finance, R&D and Marketing.

[34] Milano, S. (2013, 8 14). *Organizational vs. Operational*. Retrieved from CHRON: https://smallbusiness.chron.com/organizational-vs-operational-72509.html

The operational process of SPEKA ONLINE starts to bring in customers. There are two ways, students who didn't know SPEAK ONLINE but were newly introduced from outside through marketing of The Multicultural General Welfare Center or students who naturally flows into the acquaintance or family relationship of an existing student. Basically, we can get new students from a provider from its own channels in the former case but we also take a charge of marketing aimed existing customers in the latter case. In order to attract customers, the C2C method, which communicates with each student and their parents taught by teachers, and the B2C method, which provides benefits for re-taking and introduction events through the company's marketing department, were used.

Once the company has enough customers through the above process, Management department take a responsibility to secure and process customer data. They receive, arrange and categorize the customer's data. And students are allocated to appropriate teachers through cooperation between HR department and Management department after individual level test and personal communication process. The full-fledged economic activities begin after checking deposit of tuition fee and starting class.

Education department consists of professional English teachers and a head teacher leading and guiding other teachers. They provide actual English online education services through a widely known video calling program called Zoom. Depends on customers preference and teacher’s time table, scheduling class time is set answering the questions like how long, how often and when.

Coordination between teachers and students is progressed by Customer Service team. Their main work is to support from students and parent who can’t communicate smoothly in English with foreign teachers.

When the basic setting of class for each student is completed, because teachers have the right to manage and educate each student independently, the overall share of the company's work is reduced. During that period, the main task that the company is in

charge of is service quality management[35] and customer counselling by the Management and HR departments. Based on report from the customer service department who has a roll to bridge and coordinate between students and teacher, they make reasonable decision in a way that can benefit the company.

And Marketing and Finance functions are independent and incidental. Their work will not be specifically addressed in the operational structure because it is not produced regularly, but temporary and limited work due to project nature.

2) Management system

Management System Analysis (MSA) has been modified in Sinka Kershett's Management Systems Model (MSM) (Kershett, 1985; Sinkwa Turtle, 1989). The MSM consists of three components: who manages (administrator), what is managed (organizational system), what is used to manage (management tools), and interface (decision/action, measurement/data and information description/recognition). Managers make decisions that turn into actions based on what they manage. Manage operational tools, people, machines, and systems (organizational systems).
The MSA is designed to help you build and improve your management systems. In particular, it helps you define the organizational systems you manage, identify interventions to improve organizational systems, and develop measurement systems that determine how these systems are being performed. MSA is intended to continuously improve the performance of organizational systems. The report and analysis of SPEAK ONLINE's management system focusing on main three elements mentioned above (manager, organizational system and management tool) is as follows.

- Who manages? (Manager)

  The main entity that manages management in SPEAK ONLINE is the management department. This includes CEOs, HR directors, and administrative assistants. The areas managed are the company's overall operation and whole staff, and include

[35] Joji ARAI, A. B. (1996). *Productivity and Quality Management: A Modular Programme - Part I:*. Geneva, Tokyo: International Labour Office Asian Productivity Organization .

collaboration with external stakeholders. Management mainly deals with issues of high importance within the company, such as planning, planning, and strategy establishment, and makes appropriate judgments and decisions about institutions and people in the management target. The final say is with the CEO.

- What is managed? (Organizational system)

The management targets include all departments other than Management like Human Resources, Education, Customer Service, Marketing, Finance and R&D. SPEAK ONLINE can be defined as a centralized structure with hierarchy so the direction of reporting proceeds from bottom to top, and the direction of decision-making proceeds from top to bottom.

- What is used to manage? (Management tool)

Management tools usually refers somethings that make the working process easier. It can be decided depends on the size and specialization of the project or company. While simple projects require nothing more than a to-do list, complex ones require proper planning, assigning tasks, setting deadlines, making sure that everyone sticks to them, and tracking the time spent.[36] So, it is needed to identify and delegate tasks properly according to their importance and that's where the use of management tools comes in. In SPEAK ONLINE, there is no specialized tool to use like other company. It may be the result of lacked informatization or system but it is also fact that the company or project is not large enough to use the management tool by investing capital and manpower so far.

3) SWOT analysis & matrix

SWOT analysis is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats of a business or project. It helps in identifying the internal and external factors that can affect the success of the business. And each sector stands for the meaning as follows:

[36] Duggal, N. (2023, 2 2). *Top 22 Management Tools You Must Know in 2023*. Retrieved from simplilearn: https://www.simplilearn.com/best-management-tools-article

- Strengths: These are the internal factors that give a business a competitive advantage, such as skilled employees, strong brand recognition, or efficient processes.
- Weaknesses: These are the internal factors that hinder a business's success, such as outdated technology, inadequate financial resources, or lack of skilled workforce.
- Opportunities: These are external factors that a business can leverage to grow and succeed, such as new market opportunities, changing consumer trends, or technological advancements.
- Threats: These are external factors that can negatively impact a business, such as intense competition, economic downturns, or regulatory changes.

SWOT matrix, also known as TOWS analysis or TOWS matrix, is a strategic planning tool that builds on the SWOT analysis by using it to generate strategies. It helps in identifying the strategic options that are available based on the SWOT analysis. The results are in four possible strategies as follows:

- Strengths-Opportunities (SO) strategy: In this strategy, a business uses its strengths to take advantage of opportunities in the market.
- Strengths-Threats (ST) strategy: In this strategy, a business uses its strengths to mitigate the impact of threats.
- Weaknesses-Opportunities (WO) strategy: In this strategy, a business improves its weaknesses to take advantage of opportunities in the market.
- Weaknesses-Threats (WT) strategy: In this strategy, a business addresses its weaknesses to mitigate the impact of threats.

And it is the result of the SWOT analysis and matrix of SPEAK ONLINE conducted with research.

SWOT analysis

Strengths	Weaknesses
1. Stable supply chain 2. Price competitiveness 3. Friendly and approachable brand image focused on middle and low level of students 4. Various option for payments 5. Prepared tutors for early beginners 6. Same payment with higher skilled level of teachers	1. Lacked of materials and programs 2. Lower professional tutors and employees 3. No diversity of tutor's nationality 4. Marketing strategy 5. Unstable finance management 6. Division of Korea and Ukraine department
Opportunities	**Threats**
1. The age group interested in English-speaking is getting lower 2. the primary English education market is activated 3. Increased need and demand for speaking tests 4. Preparation for Group lesson 5. Seeking ways to revitalize the website	1. Strong competitors (red ocean) 2. the possibility of interruption in class because of Russia-Ukraine war 3. Changes of Zoom regulations 4. The level of people's expectations increased through advertising of other company 5. Strengthening educational law for young students

Fig 2.8 SWOT analysis table

As a result of analyzing Speak Online with SWOT matrix, the representative strength was customer-friendly brand image and service. Rather than specializing in English speaking, Speak Online's education focuses on improving the accessibility of English speaking and making it feel natural, and the audience is also from beginners to intermediates who are not fluent in English. Various payment options or customer services that take into account price competitiveness and customer convenience are added to maximize the company's strength. There is a lack of diversity as a weakness. It shows clear limitations of teachers' nationality, skills, educational materials, and programs. In addition, the lack of internal functions of the company as a start-up company can be seen as a major weakness.

Looking at the external factors of opportunities and threats, it can be seen that the Korean video English market is clearly showing great profitability, and accordingly, Speak Online is also promoting development, but this is the same for our company as

well as other companies. For Speak Online, which is based primarily on Ukraine's workforce, the unfinished Russian-Ukraine war is also one of the major threats.

SWOT matrix

SO	ST
1. To develop programs and tutors specialized in Beginner English class 2. Class for official English-speaking test with reasonable price 3. Revitalizing the website using stable income	1. To endure and grow slightly with supply chain and price competitiveness 2. To complete the beginner course, be ready for governance requirement 3. Customized counseling service that analyzes customer needs and levels based on company image
WO	**WT**
1. To be professional teaching low level students, not teaching English 2. Through group lesson, to make higher profitable business structure to outsource more professional tutors 3. To develop marketing method focused on our future plan	1. To Minimize commercial activity until cover the weakness 2. To Combine the employee with different nationalities to join developing program and tutors. Not only Ukrainian employees. 3. To Check the overall compliance status of the company

Fig 2.9 SWOT matrix table

Next, four strategies, SO, ST, WO, and WT, were oriented through SWOT matrix analysis. With consideration of results from SWOT analysis in many ways, it is very risky not to know what kind of change the specificity of the current war situation will cause. In addition, considering the global economic status and the current market flow in Korea, it is possible to implement WT strategy, which compensates for weaknesses step by step, as a priority plan and consider ST strategy as a stable investment direction.

2.3 IT management and information technology environment analysis of “SPEAK ONLINE”

After listing and organizing the current status of IT management of SPEAK ONLINE companies, the analysis results of what information technology environment is appropriate are derived using the information technology environment analysis method described in Professor Kim Tae-sung's book "Innovation Bible."

1) IT management in SPEAK ONLINE

- Information technology found in operational structure

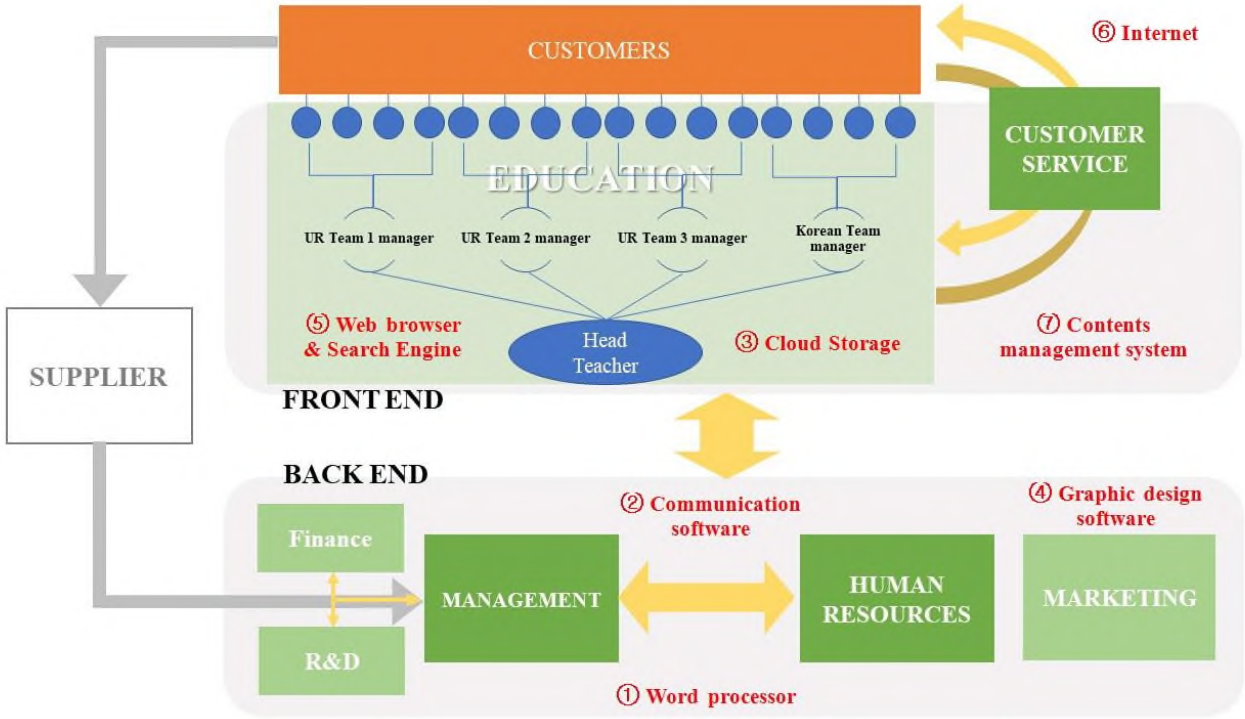

Fig 2.10 Information Technology found in Operational Structure

There are 7 informational technologies which are found in operational structure:

① Word processor – A basic tool for documentation. It is used to record, edit and organize various data and information for CRM and HRM with Microsoft Excel, HANCOM Inc. HWP[37] and Google spreadsheet.

② Communication software – Computer program or application that enables users to exchange information or interact with each other. It is including messaging software such as Kakao talk, Line, Telegram and video conferencing software like Zoom and Google meet. They enable smooth conversation between customers (students and parents) teache

③ rs and management and used for CS. Video conferencing software is the main means of providing the education services of SPEAK ONLINE.

[37] Hangul Word Processor, it was developed by Korean companies Hangul and computers, and is currently the most popular word processor used in South Korea with Microsoft Word.

④ Cloud Storage – It is a type of data storage service that allows users to store and access their files and data over the internet. It is used to store, record and share everything about SPEAK ONLINE and English education for HRM.

⑤ Graphic design software – It allows users to create and manipulate visual content. It is used to create promotional images and communicate with existing customer of SPEAK ONLINE for Marketing activities. Adobe Photoshop is used there.

⑥ Web browser & Search Engine - Now, when everyone wants to get some information, they access a web browser and search the search engine for keywords. IT, which is widely used in all departments, is mainly used to obtain information necessary for management or education. Web browsers include Google Chrome, Mozilla Firefox, and Microsoft Edge, and search engines include Google and Naver[38].

⑦ Internet – Internet allows users to access and share information and resources from anywhere in the world, and it connects a vast number of networks together. Since most of the IT service or application, most basic conditions are IT technology that is the most basic conditions.

⑧ Contents management system – it allows users to create, manage, and publish digital content, such as articles, images, videos without requiring specialized technical knowledge. SPEAK ONLINE manages and uses CMS-produced websites.

- Introduction of mainly used applications

① Messenger software – Kakao Talk & LINE

Kakao Talk is a free mobile instant messaging application developed by a South Korean company called Kakao Corporation. It was launched in 2010 and has since become one of the most popular messaging apps in South Korea and other

[38] Naver, is one of the most popular websites in South Korea, and is often referred to as the "Google of South Korea".

countries in Asia. It allows users to send and receive messages, photos, videos, voice messages, and other files. It also supports free voice and video calls, as well as group chats with up to 5,000 people. Users can also share their location, schedule events, and play games within the app.

LINE is a freeware mobile instant messaging application and communication platform developed by the Japanese company LINE Corporation. It was launched in 2011 and has since become one of the most popular messaging apps in Asia, particularly in Japan, Thailand, Taiwan, and Indonesia. LINE allows users to send and receive messages, photos, videos, voice messages, and other files. It also supports free voice and video calls, as well as group chats with up to 500 people. Users can also share their location, make payments, play games, and use various stickers and animated emojis.

Kakao Talk and Line is used for the main communication platform of economic activity in SPEAK ONLINE. Almost all communication between departments, between employees, between companies and customers, and even between external stakeholders takes place through Kakao Talk and LINE. The reason why these two applications were used is that they are a common messenger with an Asian background of managers and a high frequency of use by Ukrainian employees. In addition, the fact that it is available free of charge can also be seen as a suitable choice for SMEs.

② Video conferencing software - Zoom

Zoom is a cloud-based video conferencing and collaboration platform that allows users to connect and communicate with each other via video, audio, and chat. It was developed by Zoom Video Communications, Inc. and was launched in 2013. With Zoom, users can hold virtual meetings, webinars, online classes, and virtual events. It supports real-time video and audio conferencing, screen sharing, and recording of meetings. Participants can join meetings from their computers, smartphones, or tablets, using the Zoom app or a web browser.

Zoom has gained widespread popularity, particularly during the COVID-19 pandemic, as many businesses and individuals turned to remote work and virtual

communication. The platform has a variety of plans and pricing options, ranging from free to enterprise-level subscriptions with more features and capabilities. SPEAK ONLINE is also using Zoom programs for video conferencing, as is the case with many companies and institutions these days. Periodic meetings are often used in small groups of teachers' teams and general meetings where representatives of departments gather. It is an essential program used not only for convenience but also as a means to overcome the limitations of physical distance.

③ Cloud computing – Google drive

Google Drive is a cloud-based file storage and synchronization service developed by Google. It was launched in 2012 and has since become one of the most popular cloud storage platforms in the world.

With Google Drive, users can store and access files and folders online from any device with an internet connection. It provides users with free storage space, starting at 15 GB, which can be increased through paid plans. Users can upload, create, and share files, including documents, spreadsheets, presentations, images, and videos.

Google Drive also includes collaboration tools that allow users to share files and folders with others and work on them together in real-time. Users can invite others to view or edit files, leave comments, and suggest changes. The platform also integrates with other Google services such as Google Docs, Sheets, and Slides, which are online productivity tools for creating and editing documents, spreadsheets, and presentations.

Google Drive is accessible through a web interface or a desktop or mobile app. It is compatible with multiple operating systems, including Windows, macOS, Android, and iOS. Google Drive provides an easy and convenient way for users to store and share files, collaborate with others, and access their files from anywhere. Google Drive serves as data storage for all accessible data or documents except for some documents that require security. Educational data and reporting materials are mainly composed, and some records related to company activities are also stored.

Google drive seems to be used in that it is very accessible, can access the data needed through anyone's Google account, and can be edited or uploaded directly from a web page without any special download.

2) Information technology environment analysis

The information technology environment analysis identifies the latest trends in information technology to analyze the applicability of key element technologies suitable for the company's necessary information needs, and analyzes the efficiency of the company's information infrastructure and the system and structure of information management. The performance of information technology environment analysis consists of three tasks: identifying major information technology trends, information technology applicability analysis, and CSF/CIR association analysis. This course referred to the method of analyzing the information technology environment in Professor Kim Tae-sung's book "Innovation Bible".[39]

- Identify key information technology trends

The main information technology trend is to define information technology applicable to the company, organize general trends and technology status, and identify technologies that can be reflected in the information strategy plan.

Data related to general trends and trends by information processing structure and information technology element are collected using literature, and major information technology trends, including concepts, functions and performance, technical details, and standardization directions, are systematically organized using TBB[40] techniques.

① Trend analysis of Information Technology in online education field

In the past, online education was mainly delivered through static web pages and email correspondence. The technology was limited, and the quality of online courses was often low. Students had limited access to interactive learning tools and multimedia resources, which made the online learning experience less engaging than traditional classroom-based education.

[39]Teasung Kim, Y. K. (2014). *Innovation Bible.* Seoul: Chaos Book.

[40] TBB (technical building block) is a method for systematically grouping various technical elements constituting an information system and representing them in a block form.

Today, online education has become much more advanced and sophisticated. The use of multimedia resources such as videos, interactive simulations, and virtual reality has made the online learning experience more engaging and interactive. The widespread availability of high-speed internet and mobile devices has also made online education more accessible to a larger audience. Learning Management Systems (LMS) and other software tools have made it easier for educators to develop and deliver online courses and monitor student progress.

In the future, IT in online education is likely to become even more advanced and personalized. Artificial Intelligence (AI) will play a bigger role in developing personalized learning paths for students, based on their abilities, interests, and learning styles. Virtual Reality (VR) and Augmented Reality (AR) will continue to be integrated into online courses, providing students with more immersive learning experiences. The use of blockchain technology will increase, allowing for more secure and verifiable credentials and certificates. Learning analytics and big data will become even more important, allowing educators to use data to improve student outcomes and tailor learning experiences to individual needs.To summarize the above, it is shown in the figure below.

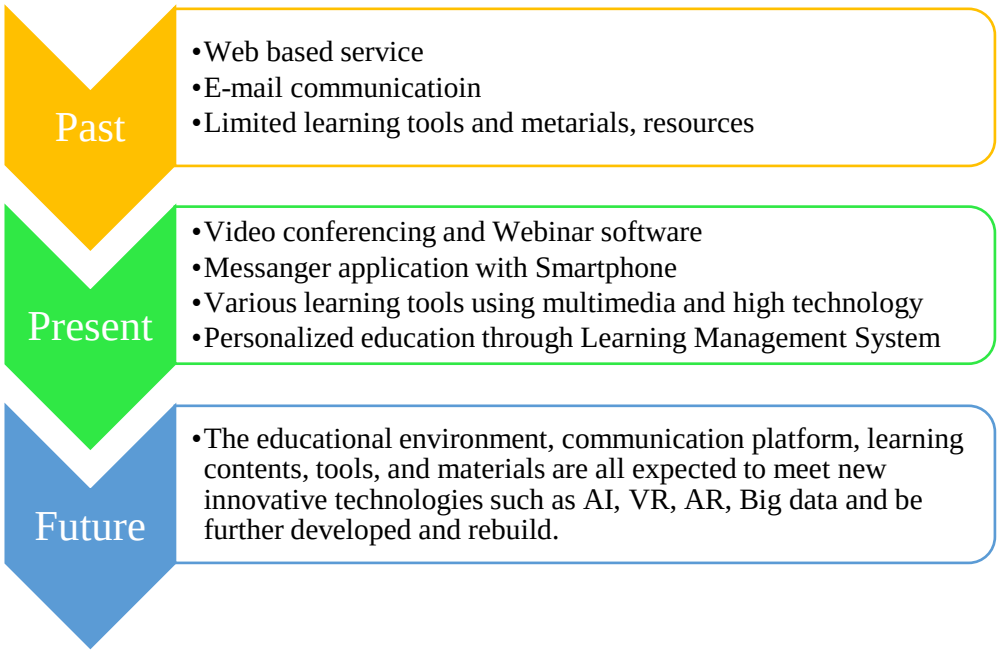

Fig 2.11 Analysis of Information Technology Flows Related to Online Education

Definition of terms

Web: A document that is accessed through the internet and is displayed in a web browser.

Webinar: A seminar or presentation that is conducted online, typically through video conferencing software or a web-based platform.

Multimedia: The use of multiple forms of media, such as text, images, audio, and video, in a single presentation or application.

Learning Management System: A software application for the administration, documentation, tracking, and reporting of educational courses, training programs, or learning and development programs.

AI: Artificial Intelligence, the simulation of human intelligence in machines that are programmed to perform tasks that normally require human intelligence, such as learning, reasoning, and problem-solving.

VR: Virtual Reality, a computer-generated environment that simulates a three-dimensional space and allows users to interact with it through specialized hardware.

AR: Augmented Reality, a technology that overlays digital information onto the real world, usually viewed through a smartphone or tablet.

Blockchain: A digital ledger of transactions that is distributed across a network of computers and is resistant to modification.

Big data: Extremely large datasets that can be analyzed to reveal patterns, trends, and associations.

② Information technology infrastructure

Information technology infrastructure refers to a collection of technical infrastructure and related elemental technologies that support the implementation of data, application systems, and services. Information technology that accepts international standards should be adopted to form an information technology infrastructure that can be expanded, interfaced, and flexibly respond to environmental changes, and reality and availability should be secured in terms of the use of information technology. When implementing application systems and services, a successful information system can be established by taking an approach to integrating each information technology element as a component of the overall information technology infrastructure.

Information technology necessary to build systems for data management and utilization, which are important in modern online education companies, are classified into eight categories as follows.

1. User interface 2. Application service 3. Application support service 4. Data service 5. Application development environment 6. Network 7. Security and system management 8. External connection environment

③ The fields of information technology and analysis

Field	Definition	Development direction	Technical elements	Application direction
User interface	Technology elements that provide the convenience of computer operation	Embracing a multimedia environment	- CUI - GUI - MUI	Provides a user-friendly interface
Application service	Apps[41] use different IT[42] elements to implement the functions required to perform users' tasks and services	To efficiently manage all resources and information	- CRM - KMS - ERP - EDMS - DBMS - CMS - Cloud	- User-centric app - Share and increase availability of data
Application support service	Technology elements that consistently and integrally support the functions apps needs To increase app performance efficiency and facilitate dev.[43] and maintenance	- Ensuring interoperability of information systems - Support system dev. and ensure stable data transformation	- APIs - VCS - Frame works & Libraries - Object Web - Middleware	- Gain the reliability, scalability, and performance of application - Ease of dev. and maintenance
Application development environment	IT environment for the dev. and maintenance of apps and databases It can enhance productivity and quality throughout the dev. cycle, from building enterprise information models to analyzing, designing, implementing and maintaining unit systems	- Provide standard guides for dev. and maintenance - Support for C/S environment - It is changing to use of diverse and mixed programming languages	- C/S dev. tools - Web dev. tools - XML dev. tools - Multimedia production tools - Mobile App dev. Tools - Integrated dev. environments	- Get app flexibility and scalability - Web-based app dev. environment - Ease of dev. and maintenance

In this table, abbreviations were used for repeated words to simplify the content.
[41] App is a short form of "Application"
[42] IT is an abbreviation of "Information Technology"
[43] Dev. is a short form of "Development".

Data service	An IT environment that provides distributed file services and database management as technology elements that facilitate data access and utilization, and enables transparency and integrated management of data access	- Data exchange (file sharing and transfer) - Data transparency, security and enterprise-wide management capabilities	- DBMS - Data warehouse - Data mining - Cloud	- Data integration - Ensure data reliability/accuracy - Higher value of information - Acceptance of image data services
Network	Ensure interoperability and access transparency between information system as a technical element that connect users and platforms for each environment	- Acceptance of communication network standards - Faster data communication	- LAN - WAN	- Maximize data communication and accelerate data communications
Security and system management	Management of all resources that make up the information system, including apps, data, networks, and system platforms, and technical elements that limit and control access to these resources	- Integrated remote system control security management - Enhancement of Internet security technology	- Firewall - IDS - VPN - NMS - Electronic signature	- Ensuring system stability - Centralized systems management and security management
External connection environment	Consolidation of relevant technical elements for external connection	- Send and receive data and messages online - Security management functions	- Messenger software - E-Mail - EDI	- Efficient data exchange with external associated

Fig 2.12 Table of information technologies in need

Definition of terms

CUI: Character User Interface

GUI: Graphical User Interface

MUI: Multimedia User Interface

CRM: Customer Relationship Management

KMS: Knowledge Management System

ERP: Enterprise Resource Planning

EDMS: Electronic Document Management System

DBMS: Database Management System

CMS: Content Management System

Cloud: Refers to servers accessed over the internet

APIs: Application Programming Interfaces

VCS: Version Control System

Frameworks & Libraries: Pre-written code for common tasks in software development

Object Web: A web architecture that uses object-oriented programming principles

Middleware: Software that connects different software applications or systems

C/S dev. tools: Software tools used for building applications that run on a client-server architecture.

Web dev. tools: Software tools used for creating and managing websites and web applications.

XML dev. tools: Software tools used for creating, editing, and processing XML documents.

Multimedia production tools: Software used for creating multimedia content

Mobile App dev. Tools: Tools for developing mobile applications

Integrated dev. environments: Software that provides a comprehensive environment for software development

Data warehouse: A large repository of data that is used for reporting and analysis

Data mining: The process of analyzing large datasets to discover patterns and insights

LAN: Local Area Network

WAN: Wide Area Network

Firewall: A security system that monitors and controls incoming and outgoing network traffic

IDS: Intrusion Detection System

VPN: Virtual Private Network

NMS: Network Management System

Electronic signature: A digital signature used for authentication

EDI: Electronic Data Interchange

- Information technology applicability analysis

Critical Information Requirements (CIR) are derived based on Critical Success Factors (CSF), vision and strategy analysis, and major information technology trends, and based on this, the direction, scope, and application challenges of major element technologies are analyzed.

① Based on the strategic tasks and CSFs derived from internal and external environmental analysis, CIR is derived.

Critical Success Factors (CSFs) are high-level goals that organizations must achieve in order to achieve strategic goals. CSF is used at the project, program, or organizational level. However, CSF is usually closely related to an organization's business strategy and is utilized at the entire department or organization level. Achieving key success factors mainly leads to meaningful value and revenue generation. In particular, CSF is a strategic objective at a higher level. Therefore, it does not necessarily include details about the execution.[44]

This was defined by John F. Rockart's publication of an article in the Harvard Business Review to explain and name the critical success factors. In this article published in 1979, Rockart describes CSF as follows.

"[Critical success factors are] the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. They are the few key areas where 'things must go right' for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired."[45]

And through a series of processes, the CSF of "SPEAK ONLINE" was derived with the team as follows.

- Advanced customer management system

[44] Martins, J. (2022, 10 11). *How to use key success factors (CSFs) to support strategic planning*. Retrieved from ASANA: https://asana.com/ko/resources/critical-success-factors

[45] Rockart, J. (1979). Chief Executives Define Their Own Data Needs. *Harvard Business Review*, 81-93.

- Responsible HR management for Hiring strategy & Training sessions
- Professional Marketing employee and larger budget
- Automatic monitoring system about teachers and students
- Higher quality of data and materials for English study

Then what CIR is? It basically means the user's requirements and purpose for building an information system, and includes not only the feasibility of it.

To derive it, an informatization requirement analysis methodology was introduced. This is a methodology that defines procedures and outputs that derive requirements through rough requirements and requirements investigation techniques from the stage of information technology planning, and analyse requirements alternatives to actual corporate information projects.

The informatization requirements analysis methodology consists of three parts: a planning area for conducting research and investigation necessary for requirements analysis, an analysis area for analysis using analysis techniques, and an evaluation area that checks feasibility, prioritizes, and organizes outputs for reuse.[46]

And through a series of processes, the prioritized CIR of "SPEAK ONLINE" was derived with the team as follows.

- Data management
- LMS establishment
- CMS establishment

② Based on the CIR, the direction, scope, and task of using information technology are set.

[46] Sangyu Lee, C. L. (2003). A study on informatization requirements analysis methodology for enterprise informatization. *Journal of the Korea Management Science Association* (pp. 293-294). Seoul: Korean Society of Management Sciences.

	Direction of application	scope	task
Data management	Organizing basic data materials for analysis and predictions, it leads to strategic planning and future goal	For available data in whole operational process and departments	- Dataization student personal information and learning outcomes - Dataization employee information and performance results - Dataization your assets and learning resources
LMS	- Coordinate students' class schedules and check the contents and progress of the class - Monitoring teachers' curriculum	Education department and HR department data	- Discuss with management team to materialize LMS model - LMS implementation based on open source - Education and Promotion of Utilization Plan
CMS	Improving CS Quality and Finding Prospects	Customer data	- CMS implementation based on open source - Analysis customer relationship and setting marketing strategy

Fig 2.13 direction, task and scope of CIRs

③ Analysis of applicable technical elements is performed by referring to major information technology trends.

First, the applicable technical elements are evaluated based on five assessments, and the implementation is initiated by prioritizing them in the order of high applicability. The evaluation is rated on a five-points scale, the lowest number means “Very low” and the highest number means “Very high”.
There are five evaluation standards and its explanation below:

☑ Technology maturity: It refers to the level of completeness of the relevant element technology, and the degree to which stable maintenance is possible when introducing the technology because large-scale technology supplementation and upgrade are not expected in the future.

☑ Standardization: The degree to which this element technology has been selected as an industry standard and an industry standard as a trend of global information technology development.

☑ On-site verification chart: The degree of large number of on-site sites using the relevant element technology.

☑ Ease of development/operation: Level of difficulty in development/operation as to whether the relevant elemental technology is easy to acquire and utilize.

☑ Investment costs: the relative excess of investment costs in the introduction of the relevant factor technology.

Applicability assessment / Technical elements	Technical maturity	Standardization	On-site verification chart	Development/ Operation Ease of Use	Investment costs affordability	TOTAL
Data management	4	5	5	4	3	21
LMS establishment	1	4	5	2	2	14
CMS establishment	3	4	3	3	3	16

Fig 2.14 Table of applicable technical elements evaluation

As a result, Data management scored the highest 21 points and is selected as the top priority. In the next order, CMS establishment (16 points) and LMS establishment (14 points) were concluded.

Data management is very fundamental and important technology factor that contributes greatly to increasing the scalability of the business. It is possible to objectify and digitize the data held by various departments and accurately analyze the current situation of the company in the process. In addition, the data can be an important source for running other applications, and the resulting predictions and strategies can further grow the business. It can be seen that the meaning of implementation is very great in that it has abundant possibilities.

- CSF/CIR association analysis

CSF&CIR analysis identifies the relationship between major success factors derived from general environmental analysis and major informatization requirements derived from information environment analysis. To this end, the procedure for identifying the applicability of information technology is as follows.

In order to analyze the applicability of information technology necessary for informatization of target companies, CSF and CIR derived through strategic task

identification and surveys/interviews are defined, and second, an informatization strategy for establishing a future model is established through CSF/CIR association analysis.

① Define CSF & CIR

- Strategic plan

Strategic plan	Description
SO strategy	☑ To develop programs and tutors specialized in Beginner English class ☑ Class for official English-speaking test with reasonable price ☑ Revitalizing the website using stable income
WO strategy	☑ To Be professional teaching low level students, not teaching English ☑ Through group lesson, to make higher profitable business structure to outsource more professional tutors ☑ To develop marketing method focused on our future plan
ST strategy	☑ To endure and grow slightly with supply chain and price competitiveness ☑ To complete the beginner course, be ready for governance requirement ☑ Customized counseling service that analyzes customer needs and levels based on company image
WT strategy	☑ To Minimize commercial activity until cover the weakness. ☑ To Combine the employee with different nationalities to join developing program and tutors. Not only Ukrainian employees. ☑ To Check the overall compliance status of the company.

Fig 2.15 Table of strategic plan of SPEAK ONLINE

- CSF definition

CSF	Description	Associated strategy	Applicability assessment
CRM system	It is required for advanced customer relationship management to figure out potential customer and customer's needs.	ST strategy	Establishment process and employee using CRM tool.

HR team restructuring	Due to the service quality development, it is required diversity and specialty in teachers. So, discovering a talent and providing training session is crucial. To cover all of the activities, HR team restructuring is inevitable.	SO, WO, WT strategy	Assignment more employees and team projects for development hiring and training process.
Marketing strategy	One of the cost-free and effective informatization method. It is required to build own customer chain.	WO strategy	Implement of DB marketing and online marketing strategy to leverage social media
Monitoring system	For educational service quality management of teachers and data mining for CRM	SO, WO, ST strategy	Establishment Learning management system
Quality management	For better quality of materials which will be using for educational service and training	SO, WO strategy	Activity in community which is related with English education Larger budget management

Fig 2.16 Table of CSFs of SPEAK ONLINE

- CIR definition

CIR	Description	Associated CSF	Applicable IT
Data management	Turning Information gathered by running the company into data and use it for various analyses, investigations, and strategies	CRM system, Marketing strategy Monitoring system, Quality management HR team restructuring	Data organizing and Data mining in free DBMS
LMS establishment	Software systems to improve the convenience and quality of education for both students and teachers	HR team restructuring Monitoring system, Quality management Marketing Strategy	Several development tools such as Cloud, ERP, Integrated development tools
CRM establishment	For CRM and Marketing strategies	CRM system Marketing strategy	Customer data base and CRM tools

Fig 2.17 Table of CIRs of SPEAK ONLINE

② CSF/CIR association analysis

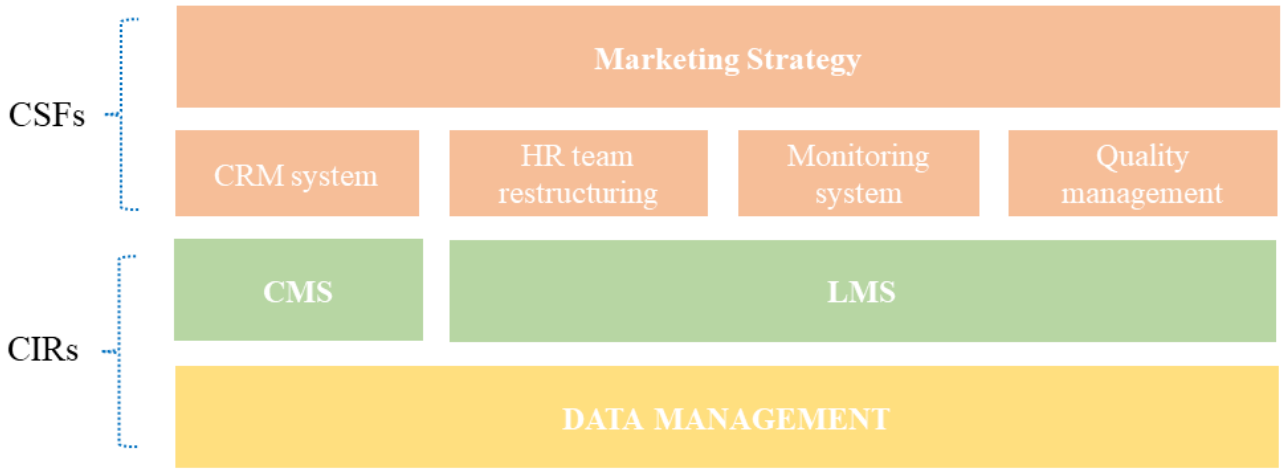

Fig 2.18 Relationship between CSFs and CIRs using TBB technique

It is a graphic which shows the relationship between CSFs and CIRs using TBB technique. And it is described as follow:

First, looking at the relationship between the CIRs of SPEAK ONLINE, data management can lead to CMS and LMS construction in the future. In addition, it is recognized as the most fundamental and essential technical requirement because it is a basic information technology to achieve all CSFs. The ones sitting on it are CMS and LMS. CMS is directly related to the establishment of a customer management system. Three CSFs can be satisfied through LMS construction. First, in an environment where a new information technology system is applied, it is possible to recheck the necessary/unnecessary personnel and organize a new HR structure. Second, by the function of LMS, it is possible to monitor by naturally leaving a record of teacher and student's class information. Third, the aforementioned functions can be used to provide appropriate feedback on the teaching method to teachers, and various functions can be developed/added to maximize the learning effect of students to manage and improve the quality of service.

When all these CSFs are met by a certain standard, SPEAK ONLINE will be able to maximize the advantages and reduce its weaknesses, and it is expected that business growth will be achieved through more effective and appropriate marketing strategies.

CHAPTER 3. WAYS OF ENHANCEMENT THE PRODUCTIVITY OF "SPEAK ONLINE" THROUGH IT MANAGEMENT IMPROVEMENT

3.1 Process and requirements for implementing CIRs of SPEAK ONLINE

1) Process for implementing CIRs

After determining the information technology in need for the company through CSF/CIR association analysis, several steps are left before it is applied and implemented. The steps of the required process according to the SPEAK ONLIEN case are shown as follows.

- Research and study

This process can be omitted if a company has personnel or departments with professional knowledge and skills in IT technology. But for non-IT companies or SMEs which don't have such environment yet, it will be a step must be taken. SPEAK ONLINE still doesn't have IT professionals, basic research and study about the CIRs is strongly recommended for company.
This includes a basic and general level of understanding and discussion of the IT that will be implemented. At a minimum, clear answers to the following questions should be drawn, and sufficient communication should be made between management and project team.

① What is this technology and what function does it has?

② Why is this technology needed and how much is it needed?

③ What is required for this technology?

- Design logical system

The process of designing data and application architectures using critical information requirements. These terms can be defined as follows:

A data architecture represents a blueprint for a database that needs to be designed from an organizational perspective. The data architecture plan includes deployment

priorities, the number of resources to invest, and the estimated investment and return for each database project.

The application architecture defines the relationship between the application areas required to support CIR and those application areas. It also reflects where the current application is implemented. Other parts of the application architecture include the interrelationships between applications, how each application supports an organization's strategy, and how data is shared between these applications.

This level of planning includes details on the accessibility, hardware and software alternatives, different architectural design approaches, and the risks, benefits, and preliminary estimated costs of each alternative and architecture. Because the nature of the plan shifts from strategy to requirements, it changes from most management and business-driven plans to technology-driven plans.

- Transformation to physical model

It consists of taking a general design of data and application architectures, then breaking them down into subsystems (or portfolios of applications) to determine the detailed configuration, prioritize, and even decide on implementation of each subsystem.

The result is a detailed system design implementation plan described below. A step in implementing a particular subsystem or application, typically these steps include:

① Schema and Sub-Schema Specifications for Databases

② Software Specifications

③ System Component Specifications

- Implementation

This occurs once or several times on each system defined in the Detailed System Design Implementation Plan. The result is an operational subsystem that supports the organization's business functions. This step is similar to the system life cycle from the application feasibility study. The difference is that system implementation starts with

the concept of analyzing information technology requirements and guides integration and implementation with other subsystems. The overall system implementation plan should include three key components:

① Project scope, development strategy, and impact on the organization.

② Project costs and duration, and expected benefits from successfully completed projects

③ Risk assessment for projects and coordination of control systems to minimize risk to the organization of specific projects.

2) Guidelines with examples and details – Data management

The following is an example of some of the data management implementation processes, which were the top priorities of CIR of SPEAK ONLINE.

- Research and study

Data management is the process of collecting, storing, organizing, and managing data held by an organization. Effective data management is an important part of building IT systems that provide analytics to help run business applications and drive operational decisions and strategic planning for corporate executives, managers and end users. The data management process includes a combination of different features aimed at making data on enterprise systems accurate, available, and accessible.[47]

Data is considered a key enterprise asset that can be used to make more informed business decisions, improve marketing strategies, optimize business operations, and reduce costs, all of which lead to revenue generation. However, without proper data management, incompatible and inconsistent data sets and data quality issues can limit or worsen the execution capabilities of applications that support analysis and prediction.

[47] Craig Stedman, J. V. (2022, 12). *What is data management and why is it important?* Retrieved from Tech target: https://www.techtarget.com/searchdatamanagement/definition/data-management

In addition, the importance of customer data management is growing, especially as companies are required to fulfill their legal obligations of the Privacy Act, and as more cases are disadvantaged otherwise. Companies are also capturing a growing volume of data and a wider variety of data types that are characterized by large-scale deployment of big data systems, and without the right data management system, these environments can be difficult to handle and navigate.

In particular, SPEAK ONLINE has continued to meet and relate to a large number of students for small businesses within a limited customer area. There, the lack of customer management was very large, and it cannot be denied that this is the reason for the limitation of customer creation. It can also be seen as essential to apply more IT to SPEAK ONLINE's business execution process in the future. At least 1-3 dedicated workers as a team for this task and data management system (such as MongoDB or MariaDB) and data-related work to save spending.

3) Method of implemented system management

It is difficult to fully utilize or continuously develop new information technology just by introducing it into the work environment. In order for multiple technologies to emerge, converge, divide, and maintain a stable system one by one, a certain process must be repeated. This is called the System Development life cycle.

Fig 3.1 System Development Life Cycle[48]

The System Development Life Cycle (SDLC) is a conceptual model used to describe the steps involved in an information system development project, from initial feasibility studies to maintenance of completed applications. SDLC can be applied to both technical and non-technical systems, but most use cases are IT technologies such as hardware and software. Project and program managers typically participate in SDLC with system and software engineers, development teams, and end users.

SDLC is a great tool for timely, efficient and systematic completion of projects, continuous management/complementation, and established systems. Key benefits include:

- The development team provides a framework for identifying improvements by checking and evaluating progress. By continuously tracking tasks, all members can quickly identify delays or defects, take appropriate action to address them, and help them complete them in the time and budget they want.
- Detailed verification of the project by the test process. Expertise and accuracy are essential to develop successful software or systems. Since all businesses have their own competitiveness, the highest level of products and services possible is needed to maintain and increase the competitiveness of the company. This cycle gives the team time to create the best projects that are feasible and essential. Furthermore, since software testing is performed in multiple stages and development teams can minimize early-stage bugs, SDLC is highly unlikely to cause errors or unexpected defects in the execution stage.
- SDLC's development potential is limitless, and its implementation protects the business from financial risks, reputation damage, and legal penalties. Experts also save time and resources through misleading early detection. One of the best ways is to build the most effective workflow based on the underlying flow of SDLC.

[48] Omelchenko, E. (2023, 2 21). *System Development Life Cycles: Phases, explanations, and methodologies*. Retrieved from Global Cloud Team:

3.2 Expected effectiveness of implementing CIRs in SPEAK ONLINE

1) Establishment stability and solidity

SPEAK ONLINE is a startup SME that has just been established and has many poor aspects in terms of financial and environmental aspects. Low-quality infrastructure and little number of workers lead to low profitability and such vicious cycle has continued so far, so in order to get out of it, alternatives to new technologies and resources are inevitable. If the company defines CSFs and CIRs as solutions to take a leap forward and applies them well through appropriate investment, it will increase the possibility of improving the current educational service level and students' learning effectiveness, establishing customer-friendly management systems and independent customer creation structures, developing new business revenue models or operational models.

As a result, the CIRs implementation can be expected positive effect of strengthening competitiveness, to compensate for the weaknesses and to maximize opportunity factors of SPEAK ONLINE.

2) Informatization and centralization of management

Until now, SPEAK ONLINE's system has been to conduct teacher counseling and student counseling individually, focusing on matching between students and teachers for 1:1 tutoring. However, If the entire class is monitored through the introduction of LMS and data management, then the educational course can be efficiently checked/analyzed through digital tools, guidance and management of teachers can be conducted in a more useful and convenient form. In addition, being able to store and manage all business-related data centrally means that analysis and prediction using so much data will be possible which can be the pre step of company growth. This will systematize and organize SPEAK ONLINE, which was just a tutor agency, and make it a true online English education company.

As a result, the CIRs implementation can be expected positive effect of specialization of management structures across the company, as well as teachers' educational expertise.

3) Rebuilding brand image and identity

SPEAK ONLINE is still in the process of embodying and branding its identity. It is undeniable that various limitations and problems of the company have become obstacles in this process. Until now, it was not possible to come up with an active solution due to various environmental conditions. However, if such a CIR can be built and used in practice to solve these problems in a cost-effective way, it will be possible to clearly analyze growth potential and determine direction based on the vision of SPEAK ONLINE.

As a result, the CIRs implementation can be expected positive effect of contribution to building a unique brand image and establishing a company identity of SPEAK ONLINE.

4) Marketing strategy plan development

Until now, if the business has been maintained in the form of supplying customers and providing services through stable supply chains, attracting and developing new customer markets will be the new direction for SPEAK ONLINE's growth. This is because the aforementioned stable supply chain gradually reveals the limitations of customer attraction and the diversity of business strategies due to partnership contracts, resulting in a negative forecast for business potential. Therefore, establishing an appropriate marketing strategy to attract new customers and an independent supply chain is another essential task of SPEAK ONLINE currently. Here, the establishment of CIR will be a focal point for new innovations and opportunities in the company, helping to successful branding and marketing strategies.

As a result, the CIRs implementation can be expected positive effect of success of marketing strategy and discovery of new customer markets.

CONCLUSION

In conclusion, based on the temporal background of the information age and the center of the 4th industrial revolution and the spatial background of non-IT company and SPEAK ONLINE that require information innovation, various information technologies in this era play a key role in the development of all businesses as well as human life. It can be applied anywhere regardless of field and role, so it has become a key to achieving integration, distribution, connection, and development of work in the company through high utilization and creating higher efficiency and productivity than ever before.

The purpose of this paper was to describe how information technology was used in the past in business and to find out how it can be used in the present through the case of actual companies. The challenge of this scientific research was to develop an understanding of Information Technology, define criteria between IT company and non-IT company, and investigate how IT was used in other non-IT industries or companies. Understand the actual company's management structure and commercial activities, analyze the company's competitiveness and IT environment, and study the need for IT management and its specific implementation process and application method by internship courses at SPEAK ONLINE, which is a partially business-based in Ukraine. It is possible to say that the aim of this work has been achieved by establishing an understanding of IT management in a non-IT company and performing all tasks by providing a feasible proposal.

In the first chapter, IT management is an innovative method that emerged as a new alternative to overcoming the limitations of business management that existed in the past in analog ways, and it is the result of information technology being added to theories that have evolved through several scholars to define management. In addition, in modern times, the content of corporate informatization has been added, and IT management has established itself as a practical content of practice by developing and building a methodology that can produce visible results through a series of processes. It also referred to the relationship with IT technology held by products or services

provided as a decisive factor that distinguishes between IT companies and non-IT companies, and examined how closely it works with real life through laws and cases in various countries related to information technology.

In order to prepare data that best meets the purpose of the study, the scope of the IT management framework was reduced to the IT management framework of Small-Medium sized Enterprise. IT management starts with a basic level of informatization, expands, and affects the company's strategic future plans. There are five stages of the framework, and although deploying IT management requires an investment of money and time, it has an important role and meaning. The evidence is that the level of leap depends on what level of information technology the company currently has. In order to systematically promote the IT management framework in small and medium-sized enterprises, the following strategies can be applied. First, small and medium-sized enterprises lack infrastructure and management resources, so a step-by-step promotion strategy is needed. Second, for small and medium-sized enterprises, an efficiency-oriented approach is preferred rather than an effect. Third, establishing a network and actively interacting with small and medium-sized enterprises can be of great help. Fourth, make the most of the governments or public-sector policies to foster small and medium-sized enterprises. Finally, educational services and consulting for the introduction of IT management should be combined.

In order to introduce an IT management system suitable for the situation of each small and medium-sized company, appropriate investment and talent training are essential. However, due to the poor resources and environment, there are a number of practical difficulties in immediate introduction. When trying to solve it on its own, even initial informatization can result in difficulty to expect. Therefore, the government's policy support must be combined with the company's own efforts.

Moreover, there are many cases of IT management in non-IT industries, domestic and international companies. Different industrial and level variables such as agriculture, construction, retail and SME, world-class enterprises were applied in three cases, and this case study proved that the introduction of IT management can help most enterprises innovate and develop regardless of field and environment.

In second chapter, characteristics of Speak Online company was listed to understand the beginning and goal becoming the root and company status investigation showed the result of how the seed idea created the stem, the company structure. Analysing commercial activity of SPEAK ONLINE, it was possible to determine the validity and potential of business ideas based on the current social phenomena in Korea. It is shown in accurate numbers of tables and charts and the result illustrated that there is a need for quality management like a change in the teaching method, especially aimed at middle school students. And as an alternative to increase the retake rate, it can be suggested to build a strategy targeting inflow of new elementary school students.

In order to determine the value of the Speak Online company and its services, there are research of operational structure and management system and identification of the competence of SPEAK ONLINE was essential. SWOT analysis & matrix was used as a tool for that, and SPEAK ONLINE's strength, weakness, opacity and threat were tabulated and four strategies were proposed based on it: SO, ST, WO, and WT. As a result, the current continuing war situation, the method of adopting the WT strategy and the ST strategy to build stability and solidity of the company was positively evaluated.

For the next, The SPEAK ONLINE investigates the information technology and infrastructure used in actual operational processes and identifies the company's technical requirements through information technology environment analysis. Professor Kim Tae-sung's book "Innovation Bible" was used as a reference book. There are 7 informational technologies which are found in operational structure and the mainly used applications are messenger software (Kakao Talk & LINE), video conferencing software (Zoom) and cloud computing (Google drive).

The information technology environment analysis is mainly used method for IT management introduction in a non-IT company. The performance of information technology environment analysis consists of three tasks: identifying major information technology trends, information technology applicability analysis, and CSF/CIR association analysis.

For the first step to Identify key information technology trends, the three sub tasks are suggested. 1) Analysis of the IT trend of Online Education in the past, present and

future is the process of tracking all the information technologies that are actually available in the Online education field. 2) Understanding information technology infrastructure and 3) The fields of information technology and analysis in table format enables to organize all useful contents, which is connected to the next step.

The second step is information technology applicability analysis. Critical Information Requirements (CIR) of SPEAK ONLINE are derived based on Critical Success Factors (CSF), and based on this, the direction, scope, and application challenges of major element technologies are analyzed. 1) Determined CIRs of SPEAK ONLINE are Data management, LMS and CMS establishment. 2) Based on the CIR, the direction, scope, and task of using information technology are explained. 3) With five evaluation standards (technology maturity, standardization, on-site verification chat, ease of development/operation and investment costs), Data management gets the highest scores (21points) that means top priority. In the next order, CMS establishment (16 points) and LMS establishment (14 points) were concluded.

The last step is CSF/CIR association analysis. 1) Define CSF and CIR once more putting all the related sources together 2) Association between CSFs and CIRs is illustrated using TBB technique. It is concluded that the weight and importance of data management, which was selected as the top priority, should be recognized through graphics expressing the association in a block structure, and eventually the result of the development of marketing strategies.

In third chapter, the recommending process for implementing CIR is provided such as research and study/design logical system/transformation to physical model/implementation. In order to understand the above-mentioned implementation process more easily, examples and details that may appear when targeting data management are described. The process does not end here. This is because management work such as supplementation and maintenance are continuously needed even after it is built. This can be explained by the contents of the System Development Life Cycle. Through constant repetitive behavior, systems and software become more systematic, error-free, and perfect tools.

In the end, the expected effects of realizing CIR on SPEAK ONLINE can be summarized into four points. First, strengthening competitiveness, to compensate for the weaknesses and to maximize opportunity factors of SPEAK ONLINE. Second, specialization of management

structures across the company, as well as teachers' educational expertise. Third, contribution to building a unique brand image and establishing a company identity of SPEAK ONLINE. Last, success of marketing strategy and discovery of new customer markets.

The implication of this study relates to the actualization of IT management in non-IT company is that growing a business is done by someone's constant effort. The mere establishment and maintenance of a company requires the input of several people and resources. But growth requires more advanced technology and input of substantive resources. It cannot be achieved simply by working hard on a set task day by day. Thinking about what to add, remove, and reorganize from the present, new tasks, new people, new processes are created, and the company is gradually growing in size. And after a period of stabilization that repeats it for a while, we will have to try new challenges again. One of them is the IT management in a non-IT company covered in this study. It can also be said that it was a study that explained how many and subdivided processes must be undergone in order for informatization to take place in general companies.

In addition, another point that this study suggests is that development is made in a spiral shape. This is something that many people may generally know, but I hope it will give people another new inspiration in the part of the conclusion that comes to the end through content that seems completely unrelated.

SUGGESTIONS

In order for the results of this study to not only be documented, but also be materialized and lead to a direct increase in profits to the SPEAK ONLINE company, the following contents are proposed.

1. Identify requirement to actualize CIRs of SPEAK ONLINE with minimum cost

Chapter 3 mentioned 1-3 professionals and DBMS open source as examples as minimum requirements for data management. As such, more discussion and investigation are needed on how to apply information technology by investing a minimum amount of money in LMS and CMS construction.

2. Create IT department for sustainable corporate informatization

A project team may be created to temporarily build any software or system, but as mentioned in SDLC, constant management and updates are essential for system stabilization and supplementation. This is because it is a way to properly utilize the CIR invested and built and to continue the growth and expansion of the business. Therefore, professionals who can be dedicated to IT work in the company should continue to remain.

3. Need specific budget analysis and negotiation with management

At the moment, it is best to seek ways to maximize cost efficiency due to the company's insufficient funding conditions, but nevertheless, the limitations due to the lack of funds clearly exist. Therefore, if accurate budget analysis and management decisions continue, SPEAK ONLINE's implementation of CIR will be one step closer to reality.

Also, these suggestions mentioned above can be recommended as interesting topics for further research, which requires working more practical and calculative aspects.

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