TED UNIVERSITY

Faculty of Engineering

Department of Computer Engineering

CMPE 399

by

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T.C. The General Directorate of Post and Telegraph Organization (PTT)

14.06.2021 – 09.07.2021

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1 Introduction

1.1 Overall Goal

In this internship I did, I created some products on web development and SQL because I loved these areas, I wanted to learn about web development, and I wanted to apply what I learned about SQL. In this context, I can say that I was interested in these areas to see the reflection of my desire to learn something new and the education I received at school in daily life. From this point of view, I can say that I want to focus on web development (Even if it is offered as a departmental elective course, I want to take this course to improve in this field.) and database areas in the coming days and achieve a very good level of knowledge on them.

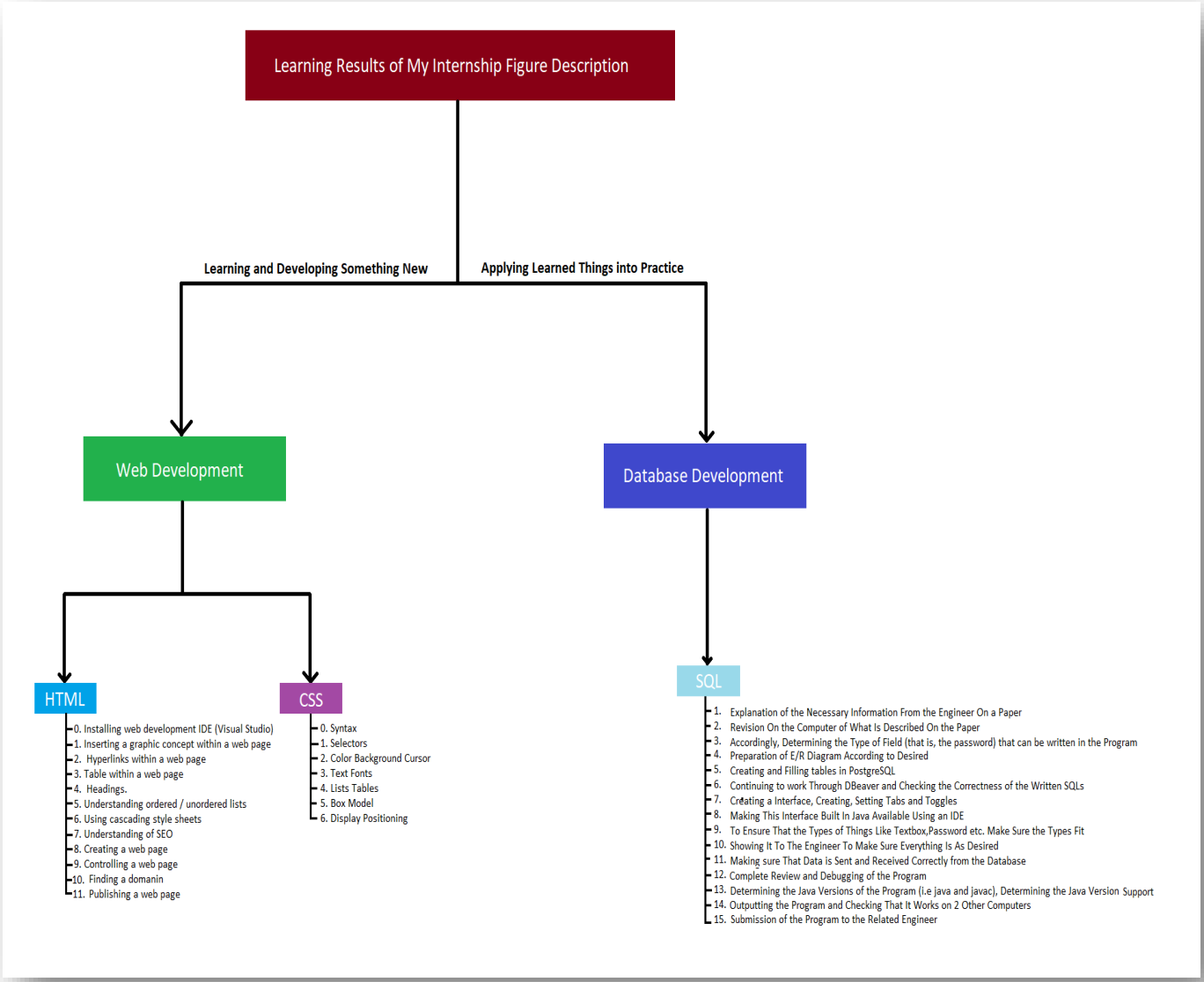

Figure 1: My Learning Tree During the Internship [1]

1.2 Expected Learning Outcomes (LOs)

During the internship, I had gains regarding the learning outcomes of this course. These gains are LO1, LO2, LO4, LO5, LO6.

LOs Mentioned in the Report

For LO1: Communicate with technical and non- technical people orally and in writing to share knowledge.

What I can say for LO1 is that the engineer assigned to me told me what to do. These conversations were purely technical and incomprehensible to those without a degree in computer engineering or who are not interested. We continued these processes both orally and in writing, as he explained it by talking at first and then writing it down on paper. I did these jobs in a non-technical way while explaining them to people who were on other posts there. The reason I told it was because they asked exactly what we were doing.

For LO2: Interpret foundational scientific, engineering, management and artistic concepts and principles.

What I can say for LO2 is that project management was very important in this regard. If WBS was not done well from the beginning, the projects would not have ended as planned, I made the delivery without any problems since it was considered and done in the slacks. In addition, research, which is an important branch of engineering, occupied an important place for my work.

For LO4: Follow current trends and developments in their fields to adapt to the changing environment, with and without guidance.

Due to the development of technology every day, the tools at hand frequently undergo changes, accordingly, I was able to make the examples that were made very long in the past, in my projects in a shorter and simpler way. (i.e., automatic site optimum format, database optimization and taking initiative in this context)

For LO5: Act professionally by following social, ethical, and cultural responsibilities.

I was away from anything unethical during and after my internship, even if it was legal, as every computer engineer should. Instead of lying about things that could not be done in the project, I explained the situation and acted accordingly.

For LO6: Design and implement a computer system, be it software or hardware or both, to serve specific needs in an efficient, interdisciplinary teamwork context.

During my internship, I designed 2 projects to serve specific causes. I made one (website) so that it could serve me and contribute to its development. My other project was designed to serve the specific reasons the chief engineer wanted (Database). Thanks to this project I made, things became much easier, and they had the opportunity to keep a record of corrupted software and programs.

Expectations: As a result, my expectations were to develop in this direction and to offer something to others, and it was.

2 The Company Information

2.1 General

Address of the Company: Kemerkaya, Cumhuriyet St. No:30 61200, 61200 Trabzon Merkez/Trabzon, Trabzon PTT HQ.

Supervisor name: Osman Öztürk

Graduated from: Fatih University

Previous Institution: Ankara PTT HQ

Profession: Computer Engineer

Working Address: Trabzon PTT

Telephone Number: 0507 868 61 95

Mail: ozturko61@gmail.com

2.1.1 Historical background

The first Postal Organization was established on October 23, 1840, as a Ministry to respond to the postal needs of all the people of the Ottoman Empire and foreigners because of the developments with the Tanzimat edict. The first Post Office was opened in the courtyard of the New Mosque in Istanbul under the name of Post Office. Following the invention of the telegraph in 1843, the telegraph service started in our country 11 years later, and a separate Telegraph Directorate was established in 1855 to discipline this service. In 1871, the Post Office and the Telegraph Directorate were combined and transformed into the Post and Telegraph Ministry. In 1876, the international postal transport network was established, and in 1901 the acceptance of parcels and money orders began. After the first manual telephone exchange was put into service in Istanbul on May 23, 1909, the Ministry of Post and Telegraph was transformed into the Ministry of Post, Telegraph and Telephone in 1909, and in 1913 it was renamed the General Directorate of Post, Telegraph and Telephone. In the first years of our Republic, the PTT General Directorate, which was affiliated to the Ministry of Interior, continued its service by being attached to the Ministry of Public Works as an annexed budget administration in 1933 and to the Ministry of Transport in 1939.

2.1.2 Engineering Units

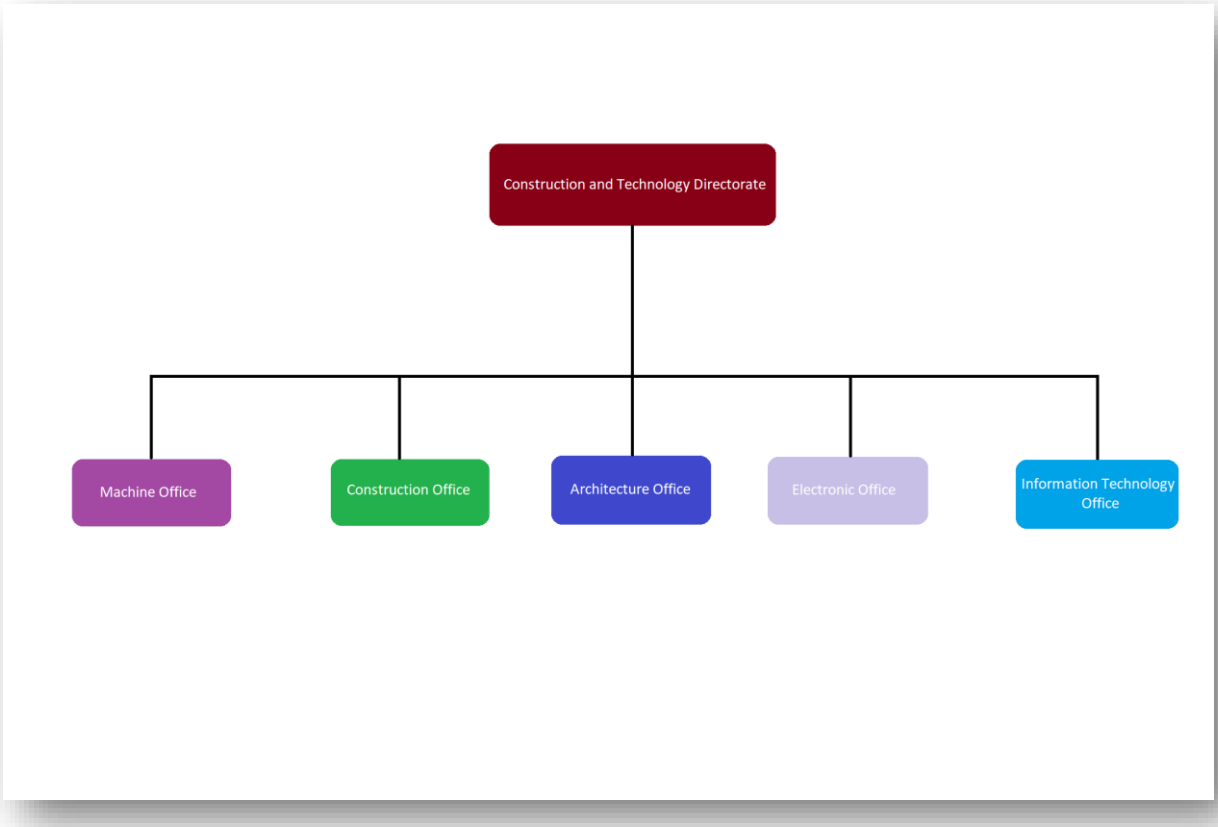

Figure 2: My Learning Tree During the Internship [2]

At the PTT, the units of engineers and architecture were gathered under the name of construction and technology directorate and were divided into 5 units: Machine office, construction office, architecture office, electronic office, and information technology office. The machine office approved the purchase, sale and maintenance of the machines related to the machines in the hands of the PTT. The construction office, on the other hand, looked at the approval of the areas to be built and looked at what kind of materials were needed. The architectural office used to make the drawing requests from the PTT. Electronics office was responsible for the maintenance of electronic devices and ATMs and reported new devices to be purchased. The Information Technology office, on the other hand, took care of PTT's software works, for example, PTT's bank application and was involved in all computer-related works. They take part in events such as ordering new computers, scrapping old ones, screwing internet cables, solving problems in people's access to computers in PTT. In short, they take care of the work required by the software and hardware. Of course, many people from the electronic office would consult with the computer and make decisions accordingly, because there was an intersection of the work of the two.

2.2 Products and Services

PTT provides services in areas such as postal, banking and logistics and continues its work. PTT, which is the leading Postal Institution of our country under the title of Post, provides services in the following areas:

Postal Services: The postal services, which was the purpose of its establishment, still serve for the PTT nowadays.

- ✓ Letter
- ✓ Telegraph
- ✓ Notification
- ✓ Combined Mail
- ✓ Registered e-mail
- ✓ Stamp and Philately
- ✓ UETS (NATIONAL ELECTRONIC NOTIFICATION SYSTEM)

Banking Services: PTT can provide almost every service of a bank in our country.

- ✓ Money Order Transactions
- ✓ Banking Transactions
- ✓ Fast Transit System (FTS/HGS)
- ✓ Account Transactions
- ✓ Bill Collections Transactions
- ✓ Insurance Transactions
- ✓ PTTcard & PTTmatic
- ✓ Salary and Pension Payments
- ✓ Other Commercial Transactions

Others: PTT offers various shopping services and telephone line services over the internet.

- ✓ EPttAVM
- ✓ PttTrade
- ✓ Pttcell

Logistic: PTT provides a cheap and safe cargo service for our country.

- ✓ PTT Domestic Logistics Services
- ✓ PTT International Logistics Services
- ✓ Packing Materials

2.3 Work Environment

The first environment I came to be your chief engineer on the same floor. After talking about what to do in this room, they said that the room in figure 4 could be my working environment, and I accepted. I came here at various times to ask the chief engineer something and went.

Figure 3: The engineer's room, where I first came and told me what and how [3]

At PTT, they provided me with a single room. After talking to my supervisor, I started working in this room within the scope of the program we determined on 14.06.2021. I was the only one in this room, if there was any problem, I would go to his room and ask, or when he came to check me, he would check that the necessary work was done properly. So, in this room, there is a person who was working in the room. That is why I could work in quite place.

Figure 4: The room where they said I could do my work after talking to the engineer [4]

3 Assigned Tasks and Projects

3.1 Problem Definition

One of the biggest problems of the chief engineer, who is a computer engineer, was that it was not known at what date and with which code the devices that were broken and repaired were recorded because these devices were passed as scrap after a certain number of deteriorations. When most electronic devices broke down, the unit they came from was information technology. Today, this was a very important problem for the company and the engineer since every job is done using technology. In this context, the lack of such recording software was a problem and I solved it during my internship.

3.2 Knowledge Integration

3.2.1 Knowledge Integration with Course Work

For Web Development: While doing my internship, I mentioned that my WBS was divided into two titles. There is no integration with course work, as I did not make the website by taking lessons from the college.

For Database Development: Here, there is a wealth of cumulative knowledge. Because to design the database with an interface, it is necessary to know a programming language. In this context, it can be said that the output subtraction and loops in the **CMPE112 Fundamentals of Programming 1** course that I took in the past years worked for me. I can say that I used the information covered in **the CMPE 211 Basics of Programming 2** course, which we delved deeper into later, much more. I have used important information such as object-oriented programming, interfaces, object-oriented coding techniques for solving problem, working with packages that we learned in this lesson. While designing the database, I opened classes and used packages accordingly. And I used the **CMPE232 Relational Databases** course, which has the most important place for this internship, in this internship. For example, first, I needed to determine what the data in the table would be and what it would consist of, and I needed to arrange their relations with each other. Then I needed to know tools such as using DBeaver and PostgreSQL because I was told to design my database with them, and I also needed to make them work in console with java. I learned all of these in this course I took. I learned the logic of working with an interface myself.

The integration distribution of the information I learned in the course is approximately as follows:

- ✓ CMPE112 Fundamentals of Programming 1 (%10)
- ✓ CMPE112 Fundamentals of Programming 2 (%30)
- ✓ CMPE232 Relational Databases (%60)

3.2.2 Learned Tools and Technologies

For Web Development

While doing my internship, I learned HTML5 and CSS via BTKAkademi. I used HTML5 as if designing the skeleton of the site, and CSS as if designing the musculature of this skeleton. I saw how these work with Visual Studio and how they make my work easier with HTML Preview and HTML CSS Support extensions. I learned how to use Visual Studio. HTML Preview, on the other hand, allowed me to see that site in Visual Studio without calling the html file every time, while HTML CSS Support allowed me to write HTML and CSS codes quickly and easily. In addition, I used the free epizy servers to transfer them to the server and I understood how the server logic works. Looking at it as a list, I learned the following for Web Development:

- ✓ BTKAkademi (As A Self-Learning Forum)
- ✓ HTML5 (As a Web Development Technology)
- ✓ CSS (As a Web Development Technology)
- ✓ Visual Studio (As a Tool)
- ✓ HTML Preview (An Extension)
- ✓ HTML CSS Support (An Extension)
- ✓ Epizy (For Server Technologies)

For Database Development

Since I started the Database program after the first two weeks, first, I can say that I learned to read and understand the work written on paper, because things started by drawing on a piece of paper. After that I used E/R diagram, and the lucid chart web tool helped me for this. After this process, I used the database programs that we frequently use in the lessons to create a database. I have integrated DBeaver and PostgreSQL to work together. After this process, I frequently used the NetBeans IDE to create interfaces and I benefited from the Java programming language while writing the program. Furthermore, while doing these operations, I learned a lot from Indian programmers on YouTube on my own. Looking at it as a list, I learned the following for Database Development:

- ✓ Designing and Reading on Paper (As a Development Tool)
- ✓ LucidChart (As a Web Tool)
- ✓ YouTube (As A Self-Learning Site)
- ✓ DBeaver (As a Database Tool)
- ✓ PostgreSQL (As a Database Tool)
- ✓ NetBeans (As a Programming Tool)
- ✓ Java (As a Programming Language Tool)
- ✓ rs2xml (As a Database Library)
- ✓ PostgreSQL JDBC Driver (As a Database Library)

3.2.3 Self-Learning

Web Development Part: I used self-learning a lot during my internship. While I was learning HTML5 and CSS, I frequently did self-learning using the videos of Fahrettin Erdinç, who was in BTKAkademi and wrote a book about it.

Figure 5: The training I completed within the scope of Self-Learning [5]

Figure 6: Certificate of the training I completed within the scope of Self-Learning [6]

Database Development Part: While developing the database and the API that works simultaneously with the database, I have benefited a lot from YouTube channels. At the beginning of these, I used the Jalal Ahmad channel.

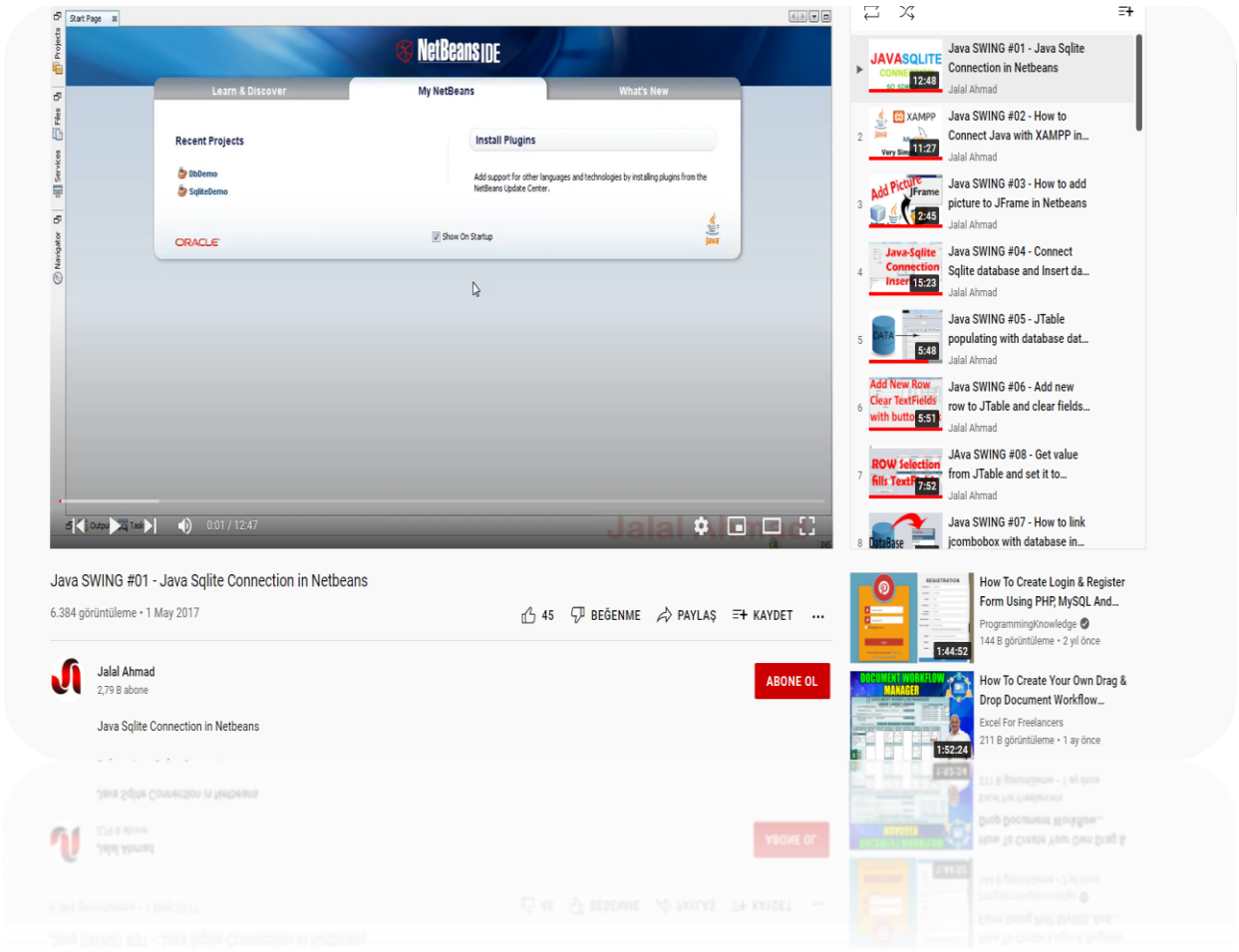

Figure7: Jalal Ahmad Channel's SQL Video List for Self-Learning [7]

3.3 Work Plan and Timeline

Task	Start	End	Duration
Learning HTML5 for website construction.	14.06.2021	21.06.2021	8 days
Learning CSS for website design	21.06.2021	27.06.2021	1 week
Preparing the tables for the SQL Program and determining the pages of the program and interface.	28.06.2021	04.07.2021	1 week
Writing the codes of the SQL Program and working in a way that is compatible with SQL	03.07.2021	09.07.2021	6 days

Table 1: My WBS in PTT

On the first day I arrived, we planned with the computer engineer responsible for me and divided the program into 2 weeks and 2 weeks. The first two weeks he asked me to do something that I could offer him in something of my own choosing. In this context, I said that I would choose website development. In this context, I started by learning HTML in the first week and continued the learning with CSS in the second week, publishing my personal site and showing it to the engineer. I also received a related certificate of participation from BTK Academy. From the 3rd week, I learned the error log program he wanted and started working on it. First, I combined the things he told me with the topics I learned in CMPE232, CMPE211 and determined my tables and what those tables would hold. In this context, I created the first interface design of the program in the way that engineer wanted. In the last week, I wrote the code of the program and checked whether it works compatible with SQL. I made the bug fix. Finally, after bug fix step, I checked it again and I presented the program to the engineer responsible for me.

Table 2: Gannt Chart About My Internship

3.4 Implementation

3.4.1 Literature review and Data Collection

For Web Development: My literature search for Web Development consisted of several sites, but also improved in my data collection. This gave me extensive training as I started my training using site BTKAkademi in the first place. In addition, I used YouTube for some things I wanted to learn. I have also used W3schools, Wikipedia, geeksforgeeks and some other sites for this purpose. The sites I use are as follows:

- https://www.w3schools.com/html/
- https://www.geeksforgeeks.org/html5-introduction/
- https://www.geeksforgeeks.org/css-tutorials/
- https://en.wikipedia.org/wiki/HTML5
- https://www.btkakademi.gov.tr/portal/course/html5-ile-web-gelistirme-13200#!/about
- https://www.youtube.com/watch?v=dBs_56iLkek&list=PLOCdSnI35cN-g7JuPVn5xWNrNVzZxmdJw

For Database Development: My literature search for Database Development consisted of YouTube, geeksforgeeks, w3school, Wikipedia and a few other sites. In this context, I did a literature review and collected the necessary data. The sites I use are as follows:

- https://en.wikipedia.org/wiki/Database
- https://www.w3schools.com/sql/sql_ref_database.asp
- https://www.geeksforgeeks.org/dbms/
- https://www.oracle.com/in/database/what-is-database/
- https://www.studytonight.com/dbms/overview-of-dbms.php
- https://aws.amazon.com/tr/relational-database/

In both of my projects, I first did my literature review and collected my data, and then I started my operations.

3.4.2 Implementation

For Web Development:

After my literature review and data collection, I slowly started my process by looking at the information and videos on the necessary sites. Since it first started by teaching only HTML5, I started by making my first website only with HTML5. The style gains I obtained in my literature search showed how sites have changed since the 90s. Looking at this, I made my way to the 90s, 2000s, 2010s and 2020s in 4 different dimensions. I was going to finish the 90s style at first. In this context, I prepared my first site.

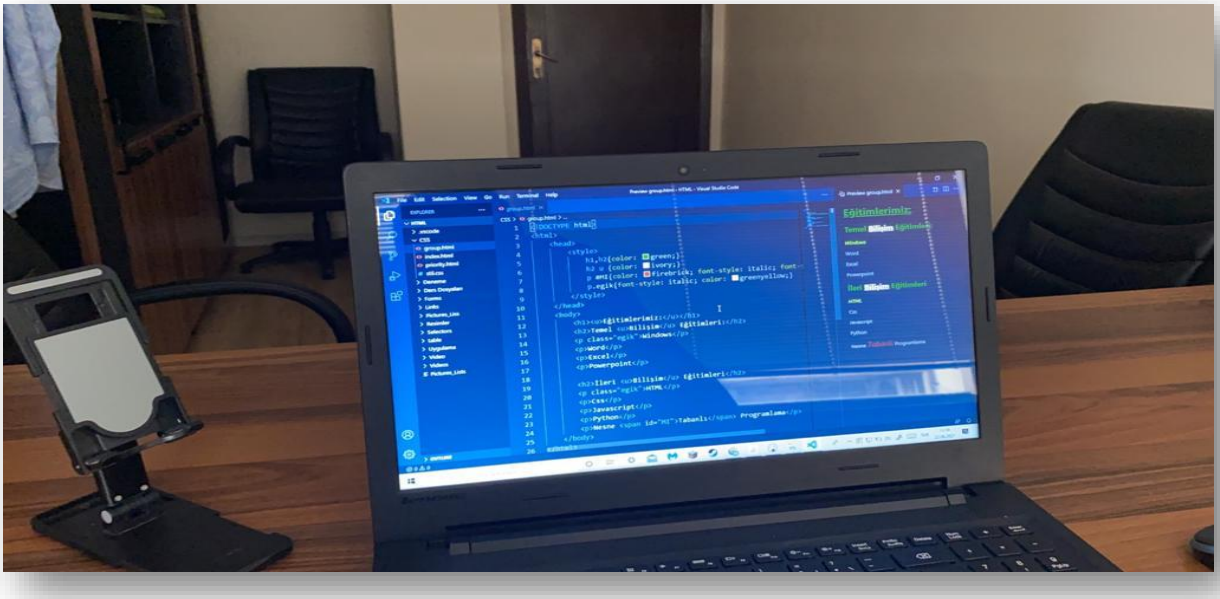

Figure 8: when trying to design the first website [8]

In this context, I designed my first site using Visual Studio and two simple but beautiful plugins. I was proceeding in this way because I wanted to see and apply from an example of everything. After all I designed my first site with only HTML5.

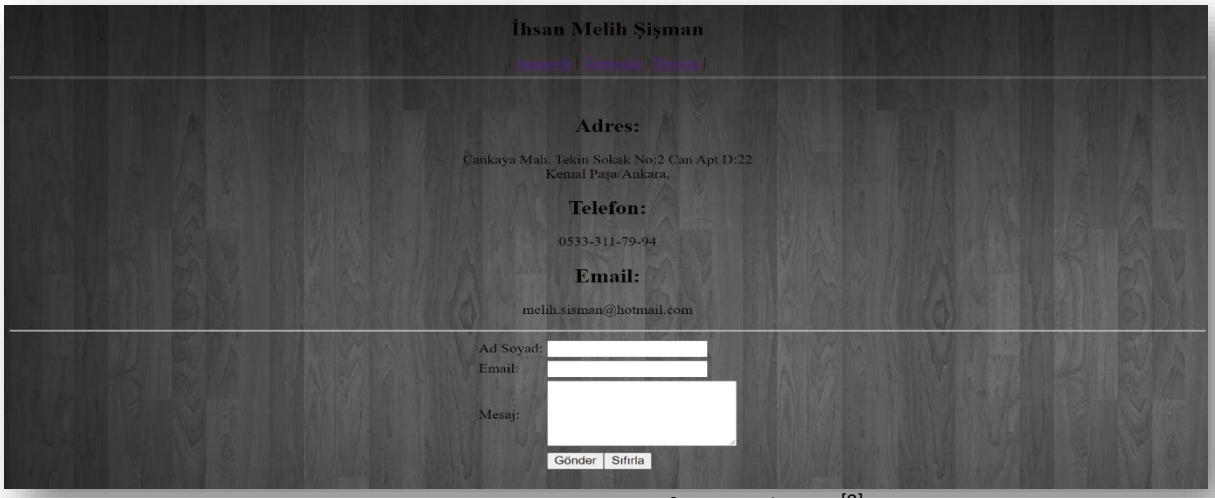

Figure 9: First view of my website [9]

After these steps, I needed to start designing the website using CSS, so I did. Along with my first CSS literature review and data collection, I started designing a website using both HTML5 and CSS, drawing on lecture videos and information from the internet. Of course, I reopened files for each CSS property many times. When I finished all of these, I was able to start making my main site. First, I started with the index page, which is the home page on every site, then I designed a page about who I am, then I created a form page where I can be contacted. Later, I created a main title about computer science to improve the hyperlink logic. To provide data download from the site, I finished my process with the CV File page. Of course, I could have gotten a ready-made template from the internet, but I thought and thought it was right to proceed in this way to learn. I created my first website with HTML5 and CSS by resizing and margining various images.

Figure 10: when trying to design the second website with CSS and HTML5 [10]

Finally, I built my site in the 90s style using HTML5 and CSS, completing the first phase of my web development roadmap. From now on I will do 2000s 2010s and 2020s style with JavaScript and various frameworks.

You can access the site from this link: http://ihsan-melih-sisman.epizy.com/whoamI.html

For Database Development: While designing the database, the first way the chief engineer told me was by writing on paper, he wrote and explained how the program would be, in this context, the visual in Figure 11 became the first document of the program.

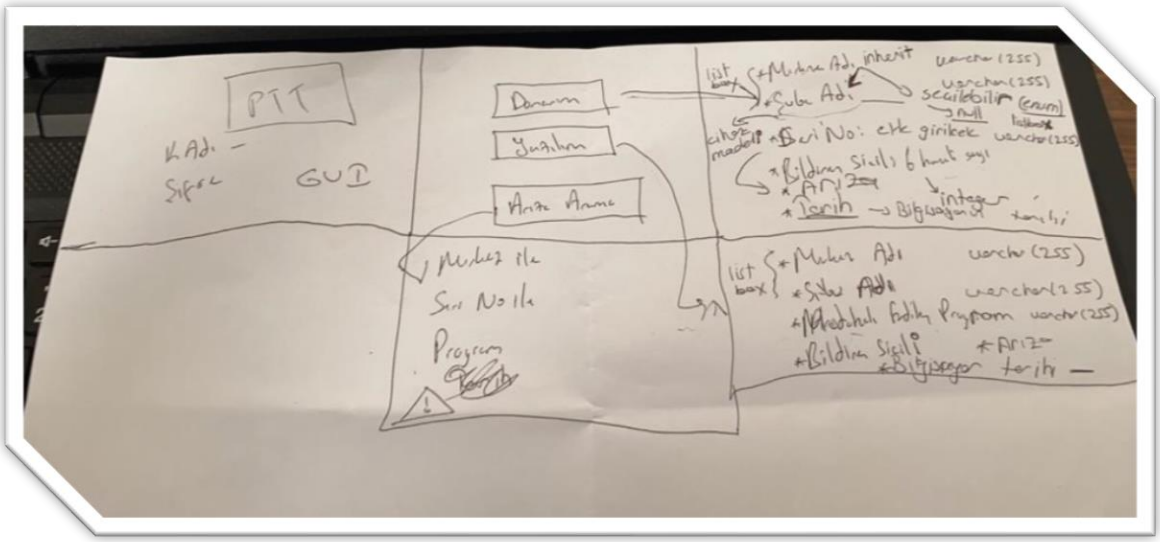

Figure 11: First document of the database program [11]

In this sense, the first thing I did after seeing this was to put it into the digital environment and see if I understood it completely. After I pictured it, I showed it to the chief computer engineer, and he agreed. In this sense, I started the project. I had it checked for accuracy at first to avoid any problems. For example, I had one control in the first 3 stages and one more control in the second 3 stages.

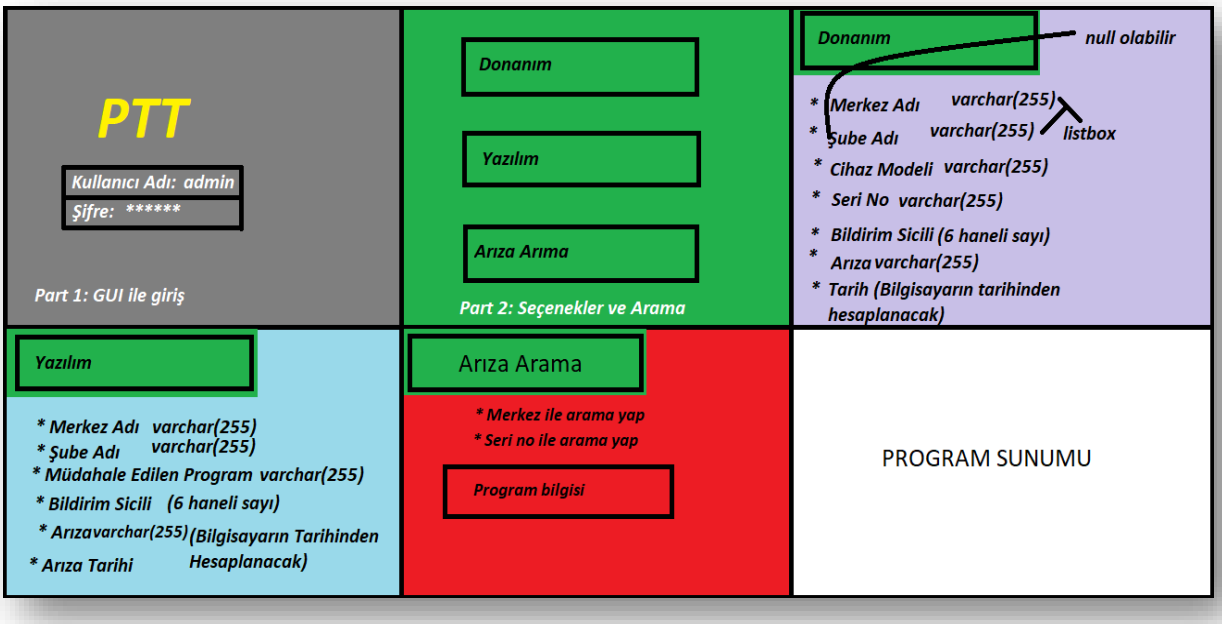

Figure 12: The Digital Version of the Document on Paper [12]

Then I moved to the database stage of the program with the interface. First, I provided DBeaver and PostgreSQL connection. At this stage, after integrating it with DBeaver and PostgreSQL, I created the tables and data of the program with PostgreSQL and determined the relationship types. this relationship can be seen in figure 13.

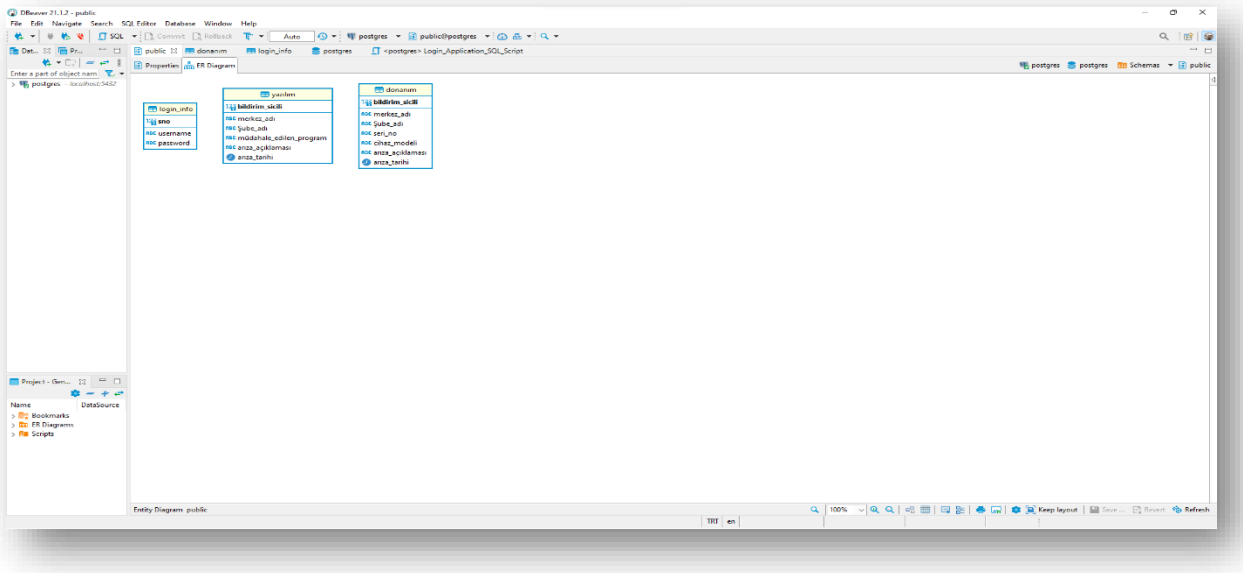

Figure 13: Determining the tables, data, and data types of the database program [13]

After these processes were approved, I took them back to the chief engineer for control and made sure that they were correct (validation & verification). Then I started writing my program using a programming language (Java) so that the program would work with a graphical user interface. After that, I started adjusting the design of the program. In this context, I started by designing the login page. and then I designed 'donanım', 'yazılım' and 'arıza arama' which are internal parts of the program.

Figure 14: The first login screen that appears when the program is run [14]

‘Şifreyi Kontrol Et’ box allows the password to appear without asterisks (*). In this way, you can check your password. If the password is entered incorrectly, the username and password boxes are reset, and an error message is returned.

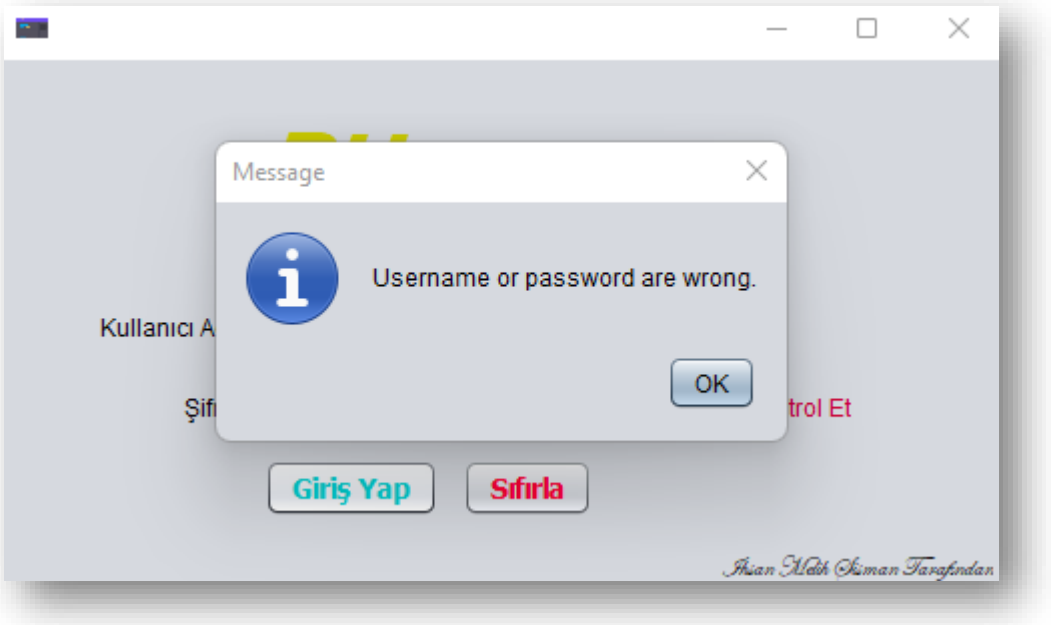

Figure 15: Error due to incorrect password entry [15]

The menu that appears on the screen after the correct entry to the program (Never access without the correct information).

Figure 16: The menu that is accessed when the correct information is entered [16]

After I passed this stage, I placed the data types of the 'Donanım Problemleri' page according to the types on the paper drawn for me. I finished this part by considering the stages such as non-functional properties. For example, such as when clicking on it, the information automatically drops boxes, figure 17 describes this page.

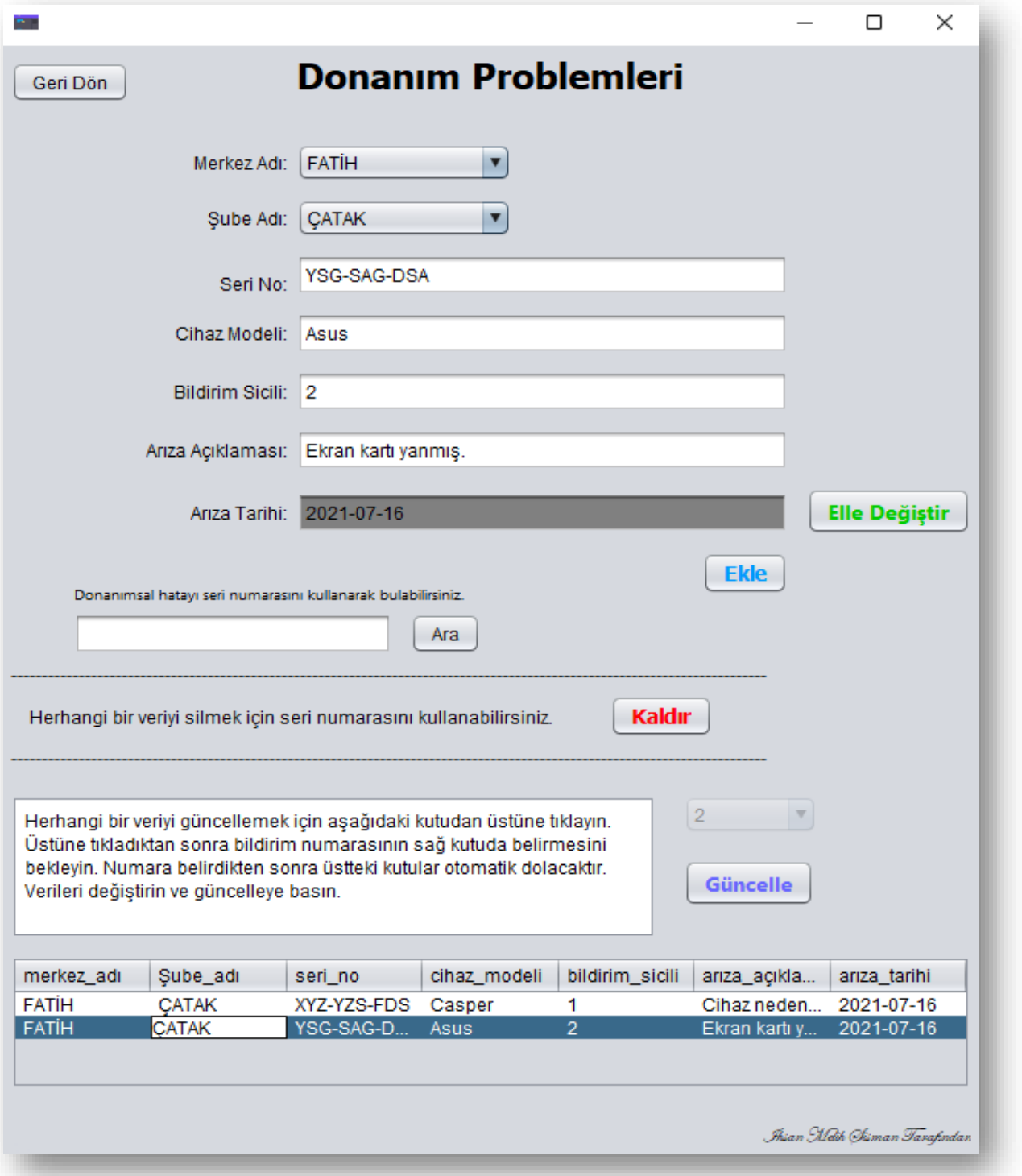

Figure 17: 'Donanım Problemleri' that can be accessed and returned from the home page [17]

After designing the 'Donanım Problemleri' page, I started designing the 'Yazılım Problemleri' page, it appears in figure 17. I placed the data types of the 'Yazılım Problemleri' page according to their types on the papers drawn for me. The same features as in 'Hardware Problems' are also included here, figure 18 describes this page.

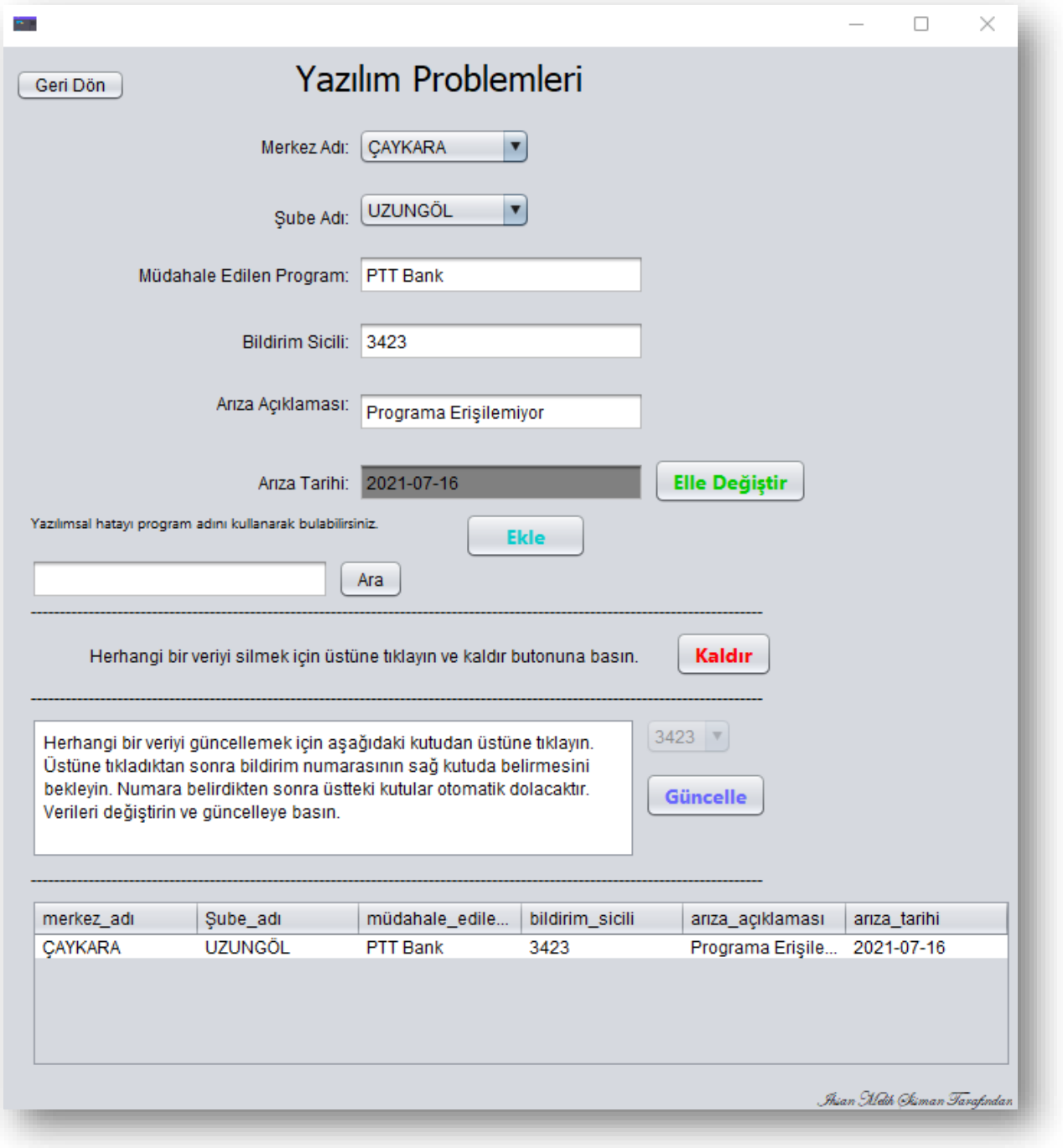

Figure 18: 'Yazılım Problemleri' that can be accessed and returned from the home page [18]

The functional features of this program are as follows: First, running the program is the first step, after the program is run, the username and password are entered. If the password is not sure, check the 'Check Password' box and the password will change from asterisk to regular letter format. If the password is typed incorrectly, the program resets the username and password, and an error message is returned. If you have successfully logged into the program, the program directs you to the home page. From here, you can choose the page according to what error you want to enter, or you can close the program with the 'Çıkış' button. If you enter 'Donanım Problemleri', the program will redirect you to that page. You can add (Figure 19) it to the database by entering the information of the types called there, or you can delete it from a database you entered, or you can remove it by clicking directly from the database, or you can remove the product by typing the serial number. 'Arıza Tarihi' is based on the day of the computer, if you want to change it, you can click the 'Elle Değiştir' button. You can return to the main page with the back button, from here you can select 'Yazılım Problemleri' and the procedure for 'Yazılım Problemleri'.

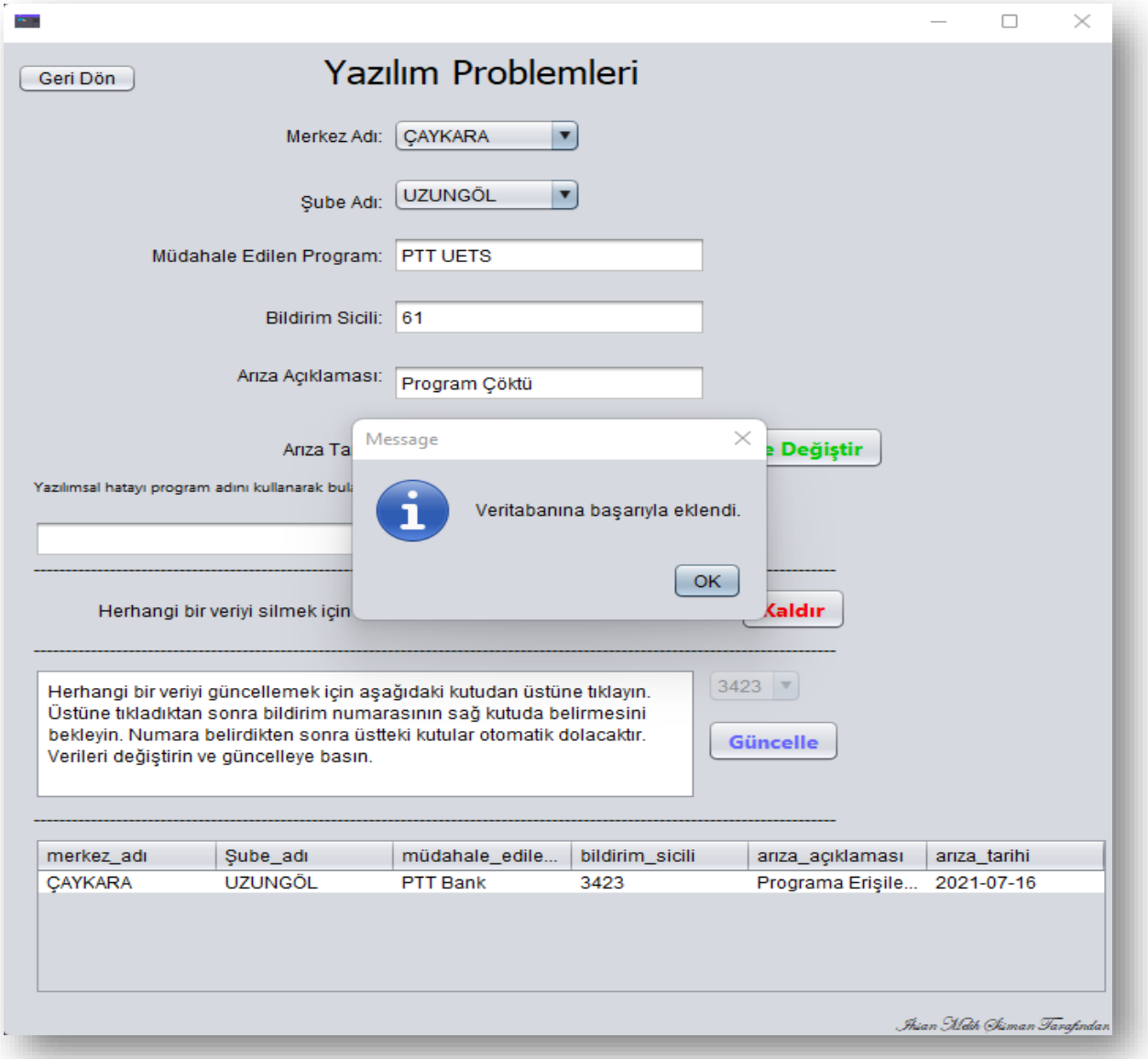

Figure 19: Add operation for 'Yazılım Problemleri' [19]

After adding, the table below refreshes itself and the data appears.

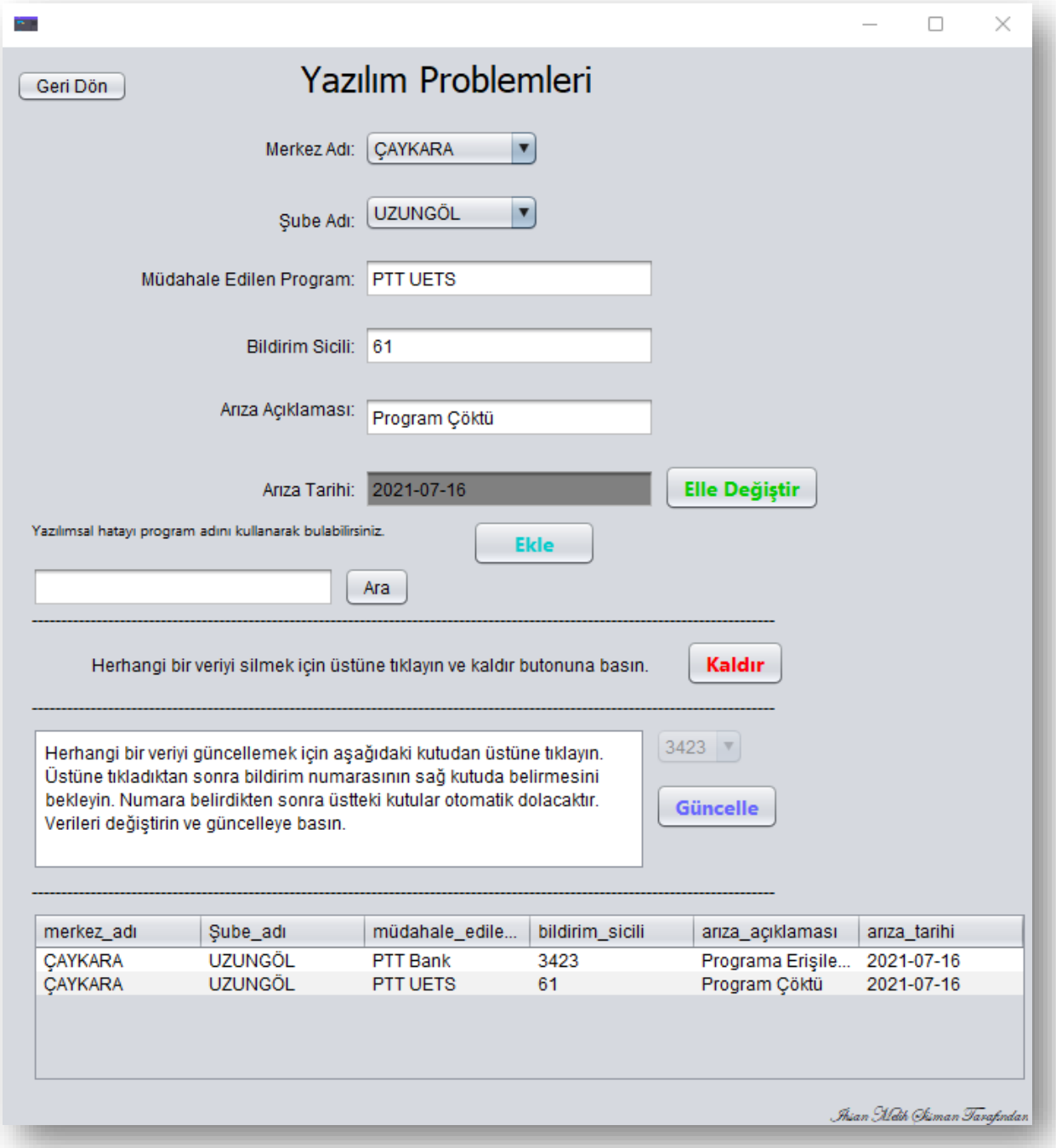

Figure 20: After adding a software problem [20]

The same operations apply to 'Güncelle' and 'Kaldır'. 'Güncelle' Updates from database, message returns. 'Kaldır' Removes from database message returns. Since it is done in this way, every transaction takes place in the database at the same time.

3.5 Evaluation & Impact Analysis

For Web Development: The performance of this project appears to be good. The site is currently working and opening quickly. The website development project, which was made in line with the priorities I set, has completed the 90's phase. Regarding performance with current products, the site responds quickly. As a result of DDos attacks, the server may crash, which can be overcome with the security brought by the server provider. It provides information for users and non-users about İ. Melih Şişman. If we look at it in terms of ethics, I finished my project without lying or delaying. This site was evaluated by my friends and their friends and found positive. This project is currently in use.

For Database Development: This product works very quickly and safely, it is also evaluated within the scope of individual and corporate needs. At first, it was progressed according to the document, and it was developed in the direction of the chief engineer's request. It is faster compared to existing products, extra functional features and non-functional features have been added. It contributes to the Republic of Turkey as error records of devices and software in Trabzon PTT directorate can be kept and viewed quickly. It allows users to get things done quickly, which non-users can't access. If we look at it in terms of ethics, I finished my project without lying or delaying. This program was evaluated by chief computer engineer, and it is used to record errors in PTT. This program was also found valuable by the chief engineer. This project is currently in use.

4 Conclusions & Recommendations

As I mentioned above, I think I have achieved the following achievements, LO1, LO2, LO4, LO5, LO6 because I explained the reasons for these, and I can say that I succeeded. In this company, the scope of the program can be further expanded, and even more comprehensive projects can be given. This state is nice, but there can be even bigger projects. TEDU engineering students should learn about self-learning because in this way, even if they are not in any program, they will be able to develop projects and gain something from there., engage in projects and have them approved in their internships. In this context, they will develop themselves a lot and they will be able to work very comfortably in the future.

In Addition to these, after successfully completing my internship, I did not think of wasting my vacation. I continued the blockchain and big data courses I took from BTKAkademi, I did a voluntary internship at Yapı Kredi and I won the championship award.

Figure 21: Volunteer internship program for which I received the championship prize [21]

Figure 22: Volunteer internship program for which I received the championship prize [22]

5 References

[1]: This picture was created by me (Creation Date: 2021, December 3).

[2]: This photo was created by me (Creation Date: 2021, December 3).

[3]: This photo was taken by Şeyda Salihoğlu Şişman (Taken Date: 2021, December 4).

[4]: This photo was taken by Şeyda Salihoğlu Şişman (Taken Date: 2021, December 4).

[5]: This photo was created by me (Creation Date: 2021, June 27).

[6]: This photo was created by me (Creation Date: 2021, June 27).

[7]: This photo was taken by me (Taken Date: 2021, December 2).

[8]: This photo was taken by me (Taken Date: 2021, June 16).

[9]: This photo was taken by me (Taken Date: 2021, June 17).

[10]: This photo was taken by me (Taken Date: 2021, June 27).

[11]: This photo was taken by me (Taken Date: 2021, June 14).

[12]: This photo was created by me (Creation Date: 2021, June 15).

[13]: This photo was created by me (Creation Date: 2021, December 5).

[14]: This photo was created by me (Creation Date: 2021, December 5).

[15]: This photo was created by me (Creation Date: 2021, December 5).

[16]: This photo was created by me (Creation Date: 2021, December 5).

[17]: This photo was created by me (Creation Date: 2021, December 5).

[18]: This photo was created by me (Creation Date: 2021, December 5).

[19]: This photo was created by me (Creation Date: 2021, December 5).

[20]: This photo was created by me (Creation Date: 2021, December 5).

[21]: This photo was taken by me (Taken Date: 2021, December 5).

[22]: This photo was taken by me (Taken Date: 2021, December 5).