

**İSTANBUL TECHNICAL UNIVERSITY**  
**Faculty of Computer Science and Informatics**

Developing software program called Human Resources Unit for the company  
by using java and SQL

# **INTERNSHIP PROGRAM REPORT**

**Ramazan YETİŞMİŞ**

**150190708**

**14 Aug – 13 /Sept 2019**

**İSTANBUL TECHNICAL UNIVERSITY**  
**Faculty of Computer Science and Informatics**  
**INTERNSHIP PROGRAM ACTIVITY REPORT**

Academic Year:

Period of Training: ☐ Summer ☐ Spring ☒ Autumn

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Major? ☒ No

Graduated? ☐ Yes

☒ No

Taking a class at ☐ Yes (Number of Classes: \_\_)

Summer School? ☒ No

**Institution Information**

Company Name: BE1 Consultancy

Department: Software Development

Web Address: <https://be1consultancy.com>

Postal Address: BUYUKDERE CAD. 193 PLAZA, Kat:2 , NO:193 1.Levent-Sisli/ISTANBUL

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**Internship Program Information**

Location ☒ Turkey

☐ Abroad

Starting Date 14.08.2019

End Date 13.09.2019

Number of Days Worked

During your internship, did you ☐ Yes, I was insured by İTÜ.

have insurance?

☐ Yes, I was insured by the institution.

☐ No, I did my internship abroad.

☒ No.

## INTERNSHIP REPORT APPROVAL FORM

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The internship report with the above given "Table Of Contents" was seen and approved for the student with student ID ...150190708... and name ....Ramazan....YETİŞMİŞ.....

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## **1.INFORMATION ABOUT THE INSTITUTION**

**Name Of The Institution**=BE1 Consultancy

**Institution Place**= BUYUKDERE CAD. 193 PLAZA, Kat:2 , NO:193 1.Levent-Sisli/ISTANBUL

### **Institution Structure And Duties**

The institution consists of an experienced team in their area. Nearly all of the team members have 20 working experiences in different fields. This team consists of 11-50 members due to the capacity of the work that they take from the clients.

### **Mission Of The Institution**

Their mission is to become a software, consultancy, technology, research, and development firm which gives services such as software, hardware, consultancy, outsourcing, maintenance, and assistance fields to the various companies.

### **Specialties**

Pega Partner, QLIKVIEW Partner, Consulting, TOGAF 9 Foundation, Enterprise Design Patterns & Architectures, Migration , Transformation Projects

### **Subject Of The Internship**

My internship is related to the companies Human Resources Unit, in the project java, SQLITE, excel and JDBC materials have been used.

## 2.INTRODUCTION

In this internship, I focus on how to solve a problem by following some basic steps like define the problem, design a solution, develop a program, test the program and create a human-centered program. These stages are very important in order to create a real-life project. Because only following these steps our program can be trustworthy to be more specific if we do these steps strictly then the program runs untroubled. For instance, in the testing stage, we test the program and find bugs then we turn back to the developing stage and redevelop the program if we satisfied with the solution then we give the program to our supervisor or who is responsible for testing the program. The responsible person tests the program before he/she gives the results of the testing and later we fix the bugs in the program and redevelop it and our program cannot become a product until it successfully passes this evaluation process. My process is like this, firstly the problem was given to me by the supervisor and then together we design the project and our process of performing the project. (*Agile approach*) Secondly, they gave me some time to find the proper tools to implement my solution. Then I gave them the tool list which I find proper to use in this project. These tools are Java, SQLITE which is an open-source database and another open-source program called JDBC this helps me to visualize the database and tables in it. With the help of these programs I manage the solve the problem and made a product of it. Also, I think my presentation skills will evolve in this internship period. These were significant points of my internship. My internship contains several goals:

- To Understand the problem and analyze the problem
- To see what it's like to be working in a professional area
- To see if this kind of job is possible for my future career
- To what skills I have to gain to perform this kind of job
- To learn how to plan and manage a project successfully
- To learn how to use the given time efficiently
- To sharpen my communication skills in a better way
- To gain experience in my working area
- To learn how to make a research about the given problem

The report contains my project activities and my experiences that I achieved in real-life working areas. The report's following chapters have also contained the difficult circumstances which I have faced during my internship period and how I have overcome these problems. Finally, in *the conclusion part* of the internship report, I mentioned neither I achieved the goals which were written above, or not.

## 2.Introduction Day

On the first day of my internship, I learned how our company works, which works I will be included and which style I will perform my job such as the Agile approach. Agile software development is an approach to software development under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer(s)/end user(s). This approach splits the work to some periods called “sprints” however by the end of this sprints we have finished the job. All morning you have 5 minutes meeting to understand our current situation while doing this we ask our supervisor the problems we faced during the process. We can say that the help of this approach the problems can be solved daily and by the end of the sprints a product comes into view. Later my supervisor in my project gave me my project called “Personnel registry and holiday program”. After that, we determined what will be finished after the first spring and what I need to complete this project.

## 3. DESCRIPTION AND ANALYSIS OF THE INTERNSHIP PROJECT

In this part, I will explain the project details, the errors I faced and how I solved them.

### 3.1.SQLITE Learning

The second day, we made the Architecture of the work in (figure1)

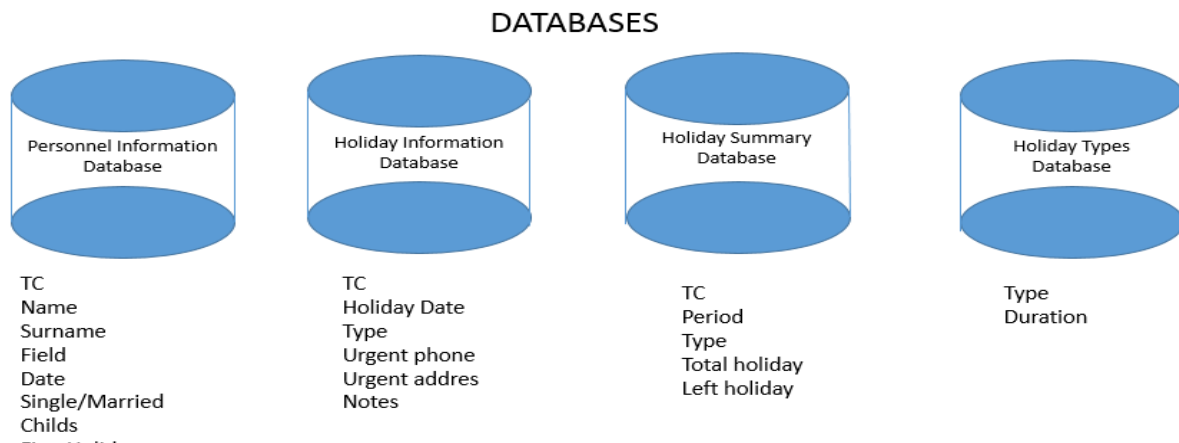


Figure 1, Database structure of the work.

As that can be understood from the structure of the work First thing I have to do is to learn how to use a Database. The database is a structured set of data held in a computer, especially one

```
sqlite> .backup testbackup
sqlite> UPDATE contacts SET email="nano@mail";
sqlite> select * from contacts;
name|phone|email
Ramo|546587|nano@mail
rr|78952|nano@mail
asd|78965|nano@mail
Avril|+90 4545|nano@mail
sqlite>
```

Figure 2, creating table and inserting data

that is accessible in various ways. I googled and found a database called SQLite. I began to learn the database today I learned how to create a table and insert data to the table (figure 2).

### 3.1.1. SQLite Carry on

```

sqlite> headers on
sqlite> create table contacts (name text, phone integer, email text);
sqlite> insert into contacts (name, phone, email) values('Tim', 6545678, 'tim@email.com');
sqlite> SELECT * FROM contacts;
name|phone|email
Tim|6545678|tim@email.com
sqlite> SELECT name, phone, email FROM contacts;
name|phone|email
Tim|6545678|tim@email.com
sqlite> SELECT email FROM contacts;
email
tim@email.com
sqlite> SELECT email FROM contacts
...> ;
email
tim@email.com
sqlite> INSERT INTO contacts VALUES("Brian", 1234, "brian@myemail.com");
sqlite> INSERT INTO contacts VALUES("Steve", 87654);
Error: table contacts has 3 columns but 2 values were supplied
sqlite> INSERT INTO contacts(name, phone) VALUES("Steve", 87654);
sqlite> SELECT * from contacts;
name|phone|email
Tim|6545678|tim@email.com
Brian|1234|brian@myemail.com
Steve|87654|

```

*Handwritten annotations:*

- "Negative values right-justify" with an arrow pointing to the header line.
- "gets the table" with an arrow pointing to the first SELECT statement.
- "Field" with an arrow pointing to the column names in the second SELECT statement.
- "insert" with an arrow pointing to the INSERT statements.

Figure 3, Querying the datas

I carry on learning SQL, I build the four database table above in (figure 1). Today's topic is about querying the data in (figure 3). And of course, we perform our daily brief meetings this morning too. After that, I learned how to make the inner join between tables. In my case the key is the TC's, we can access each person with our key. To easily see the contents of the tables I encountered with a program called "DB Browser" with the help of the program I can make changes easily without coding. (Figure 4)

Database Structure Browse Data Edit Pragmas Execute SQL						
Table: Personnel_Info						
	TC	Name	SurName	Date	firstHoliday	
	Filtre	Filtre	Filtre	Filtre	Filtre	Filtre
1	2147483647	Rr	yy	23.Mar.1998	23.Mar.1999	NULL
2	2147483647	ff	aa	12.Mar.2018	12.Mar.2019	NULL
3	2147483647	bb	rr	03.Oct.2016	03.Oct.2017	NULL
4	2147483647	Rr	yy	23.Mar.1998	23.Mar.1999	NULL
5	2147483647	ff	aa	12.Mar.2018	12.Mar.2019	NULL
6	2147483647	bb	rr	03.Oct.2016	03.Oct.2017	NULL
7	2147483647	Rr	yy	23.Mar.1998	23.Mar.1999	NULL
8	2147483647	ff	aa	12.Mar.2018	12.Mar.2019	NULL
9	2147483647	bb	rr	03.Oct.2016	03.Oct.2017	NULL

Figure 4, DB Browser Personnel Information Table

### 3.1.2. Connecting DB with Java

After the morning meeting, I began to learn to connect the database to java. In (figure 5)



```

private Connection setConnect() {
    // SQLite connection string
    String url = "jdbc:sqlite:demoSheet.db";
    Connection conn = null;
    try {
        conn = DriverManager.getConnection(url);
    } catch (SQLException e) {
        System.out.println(e.getMessage());
    }
    return conn;
}

```

Figure 5,Connection with database

I learn how to insert data into the database (figure 6). Later I create my own demo application which has lesser data than the original ones. Because more data makes the job complicated for me.

```

public void insertToPersonnelInfo(int TC, String name, String Surname, String Date, String firstHoliday) {
    String sql = "INSERT INTO Personnel_Info(TC,Name,Surname,Date,firstHoliday) VALUES(?, ?, ?, ?, ?)";
    try (Connection conn = this.setConnect();
        PreparedStatement pstmt = conn.prepareStatement(sql)) {
        pstmt.setInt( parameterIndex: 1, TC);
        pstmt.setString( parameterIndex: 2, name);
        pstmt.setString( parameterIndex: 3, Surname);
        pstmt.setString( parameterIndex: 4, Date);
        pstmt.setString( parameterIndex: 5, firstHoliday);
        pstmt.executeUpdate();
    } catch (SQLException e) {
        System.out.println(e.getMessage());
    }
}

```

Figure 6,Inserting datas to the DB with using Java

In addition, I get a different type of error due to this database connection. With the help of the try/catch statements I solved the problems more easily because in the Catch statement the error gets printed, then I understand the mistake and search it, by this way I overcome the errors easily.

### 3.2.Designing GUI:

The screenshot shows a Java Swing window with a title bar. Inside the window, there is a logo for 'BeOne Consultancy' with the tagline 'EVOLUTIONARY SOLUTIONS'. Below the logo, there is a form with the following elements: a text input field, a label 'Surname', a label 'TC', a button labeled 'Date Selection', and a button labeled 'Save'.

Figure 7,Inserting personnel to DB

To make a user-friendly app we all know that we have to create a GUI. And Also your Gui have to be simple and it should cover all the written functions. The first day I made the “Personnel acceptance application” interface. (figure 7). This GUI is a demo version but the job, it makes is the same with the original one such as It takes a person and controls its TC number with the

existing ones and compare if it is already registered to the company or not. Then if it does not exist adds to the company

### 3.3. Creating &Implementing Algorithms

To make my code neater and efficient I implemented functions that help me to make SQL querying comfortably. The functions are for calling again and again if there is any need because if you write the query instead of functions in every need your code becomes complex but if you turn them into functions you can call them easily and then mix them to make new proper functions. Then I begin to think algorithms to add the data in my Database. Today I tried to add data to the first database called Personnel Information DB. I tried very hard to design this DB because in SQLite there is no field called year or more specific ones. Mostly I used TEXT and INT variables. Because of some problems in reading excel values and writing them to the database I have to make my candidate key value (TC field) as TEXT.

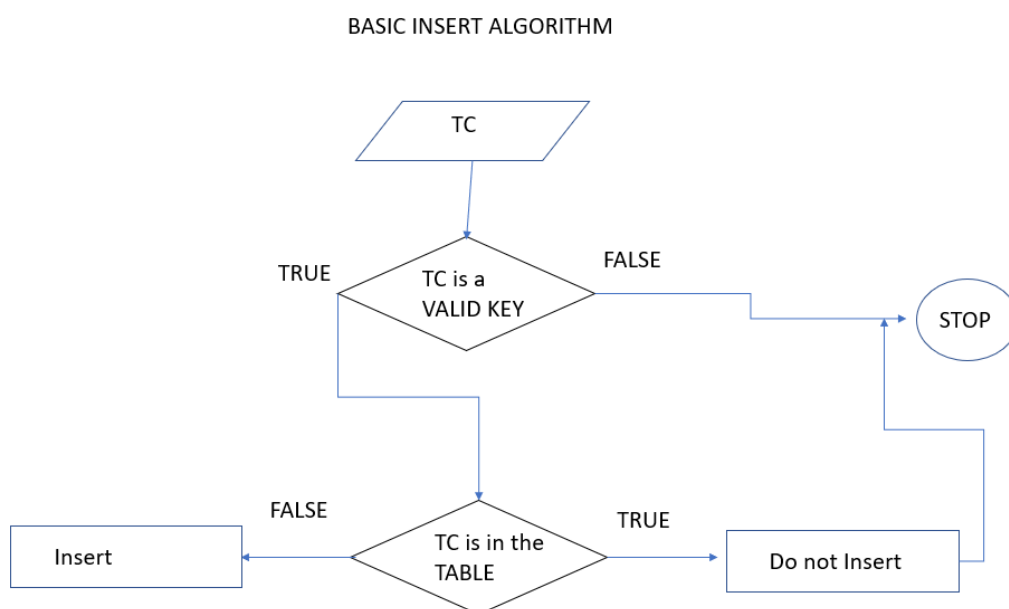


Figure 8,Flowchart of the insert method

The basics of insert function can be seen in (figure 8).

#### 3.3.1.Using Blob Variables

In today's morning meeting my supervisor asked me I can find a way to attach a pdf document in my personnel table or not. Then I search for the internet and learned that if you want to insert binary files to the database you have to use the BLOB field. Then I carry on searching to find answers about how to do this operation with using java. Finally, I came with some answers such as I read the pdf file input and turned it into bytes and then attached the file as a binary format. In (figure 9) there is a piece of function code that accepts a pdf file and returns byte array(Red lines). Later we call the function to help to insert pdf into a BLOB column called file.

```

private byte[] readFile(String file) {
    ByteArrayOutputStream bos = null;
    try {
        File f = new File(file);
        FileInputStream fis = new FileInputStream(f);
        byte[] buffer = new byte[1024];
        bos = new ByteArrayOutputStream();
        for (int len; (len = fis.read(buffer)) != -1;) {
            bos.write(buffer, 0, len);
        }
    }
    return bos != null ? bos.toByteArray() : null;
}

```

Figure 9,turning pdf file to binary file

### 3.3.2Key is Valid Or Not

As I mentioned before, the company is trying to change its working process to the agile approach so They tried this approach in my works to determine thy can be able to maintain this approach in the work fields such as if they can implement this approach to the bigger works that it will be successful or not. Until now the process is going fine I can reach my supervisor and handle the problems easily. Because if I cannot find her one or two mornings, later I able to reach her and get rid of the conflicts, for instance, I can not understand how I am going to combine the database tables to be more specific this was my first job in the working area so I do not know what things to care most or what errors I can get from user while adding data to the table so I have to ask someone who has knowledge about this type of situations. Finally, with the help of this approach, I always find my supervisor in the mornings and carry on my project with fewer breaks. Today morning meeting my supervisor gave me good feedback about the agile approach. Later I carry on developing algorithms about filling the second table of the database which called Holiday Information table. I think filling this table is going to be more challenging, there are lots of critical points to pay attention to. Because of this table links with

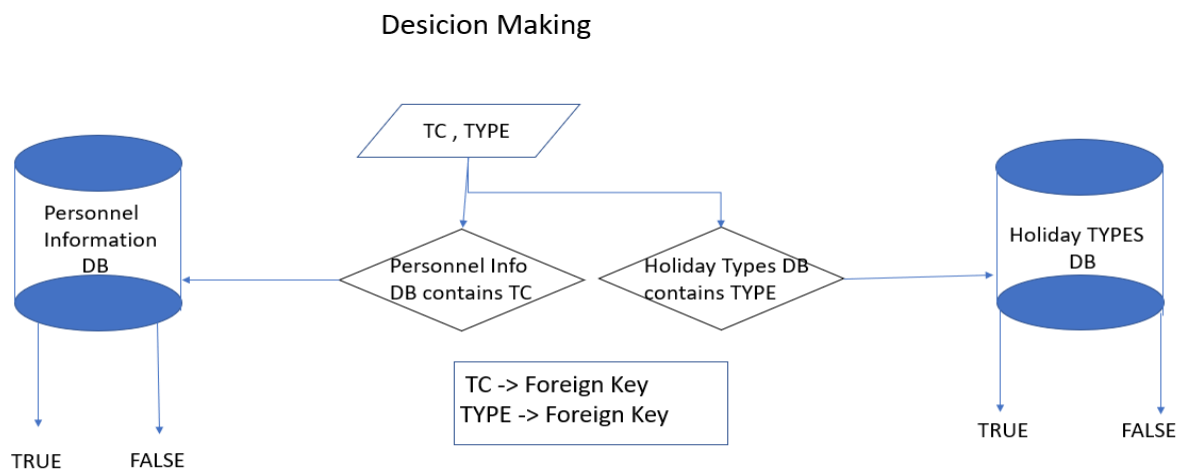


Figure 10,Decision making algorithm

the other three tables. This table has two foreign keys such that TC and Type. TC field helps us to find the person who wants a holiday, from the personnel table, in other words, the personnel table contains this foreign key or not. The Type field makes our job easier by helping us to find if the type of the user entered is valid in the company, in other words, the company gives permission this type of holiday or not. In (figure10) the basic illustration of what I told earlier.

### 3.3.3.Basics Of Getting Holiday Algorithm

Today I realized that I made some mistakes before creating the third table of the database I cannot perform my operations numerically so I ceased my other implementations and begin to create the Holiday summary table later fill it with data. Because this table has a summary of all the holidays. To make all things clear I have to give a basic example of this table to tell you actually why I need this table. In this table, I store information about the holidays which the person takes from the beginning until today. For instance person, A took 4-day Annual Leave(Type of the holiday) and in the table, it updates the pieces of information in the relevant fields such as Total holiday and Left time field. The table updates itself like this, for person A, the total holiday is equaled total holiday plus four and left time equals left time minus 4. So By the helps of this table I can determine if the time that the user asks is allowable because if the

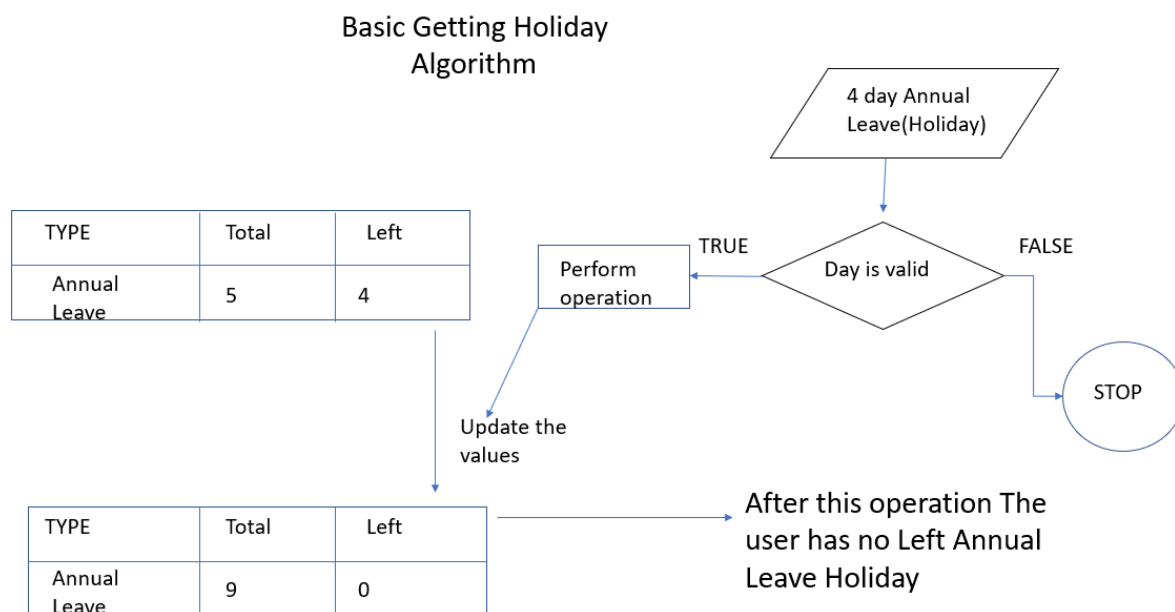


Figure 11, Holiday algorithm

person asks more time than what he/she has then that means the holiday is not valid.

The above (figure 11) shows us how A person can get a proper Holiday from the company. After the first operation as it writes the person can not take another annual leave Holiday.

### 3.4.Product Stages

After creating this algorithm with the help of the Holiday Summary table I can combine the tables properly. That means that from now on I can begin testing my project. In this way, the bugs in my applications become fewer. All we know that in order to develop a product we have to ensure that our product is completed some stages. Today my supervisor asked me to give brief information about my project such as what is the problem, How will I overcome the problem, and in which product state am I in?

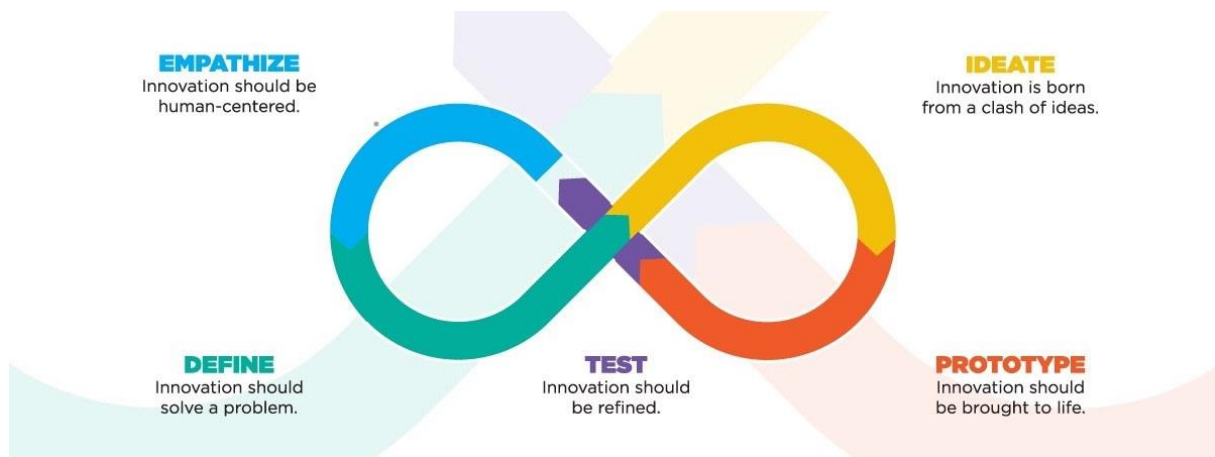


Figure 12, Product stages

### 3.4.1. Summar Of The Briefing

The problem is storing personnel information and their Holiday. I solved this problem by using different types of software programs and the and developing a human-centered application that can be used by the human resources unit of the company. I finished the designing stage and I mostly finished the pre-prototype stage. At the beginning of the second sprint(Agile approach term), I will move on the self-testing and later in the middle of the second sprint, I will give application to my supervisor for the testing stage. This stage's aim is to create more human-centered applications because in this stage the tester enters random values to the application in order to see that in any values that are given from the user my product is going to give the appropriate answer to the user. In other words, the program will crash or not. This was the summary of my briefing.

### 3.4.2. Self-testing

In the self-testing stage, I get errors that I cannot even imagine. For instance, I give some dummy variables to the program and it calculated irrelevant holiday values such as it approved the holiday when I gave NULL values to the time field. With the help of this sage, I learned that I have to write my program for the users who have no idea how to use my program. So I begin to redesign my algorithms before the testing stage which will be performed by my supervisor. The most important thing I understand from my internship is that we have to follow the ethical rules such that our product has to be smart it has to fit any user. After self-testing and redesigning, again and again, my project is ready for testing by my supervisor.

### 3.4.3. Testing

I install java, IntelliJ and JDBC to my supervisor's device. Because my supervisor has to test the project in another environment, the product has to be compilable in most of the devices. After that process, I got feedback from my supervisor that she found some bugs in my program and I noted them I turn-back to the developing stage again in order to make my product smart. In addition to feedback, I get an additional request from my supervisor that she wants from me to add an n update property to update the information which is filled wrong by the human resources unit. And from this request, I understand that our project has to be flexible

because in real life the customer can change his/her mind and if your project is hardwired then your project gets longer and longer due to this, the cost of the job is not worth the job you do.

#### **3.4.4.Re-testing**

After the middle-end of the second sprint, I did the additional requests and fixing the bugs in the program, my supervisor tested my updated program and gave me the result of the testing, my program is ready for the prod. Prod means real-life testing. The company that I do my internship is working with banks and as there can be known banks have many divisions, so in a bank when they are in prod stage they choose some divisions to test the new application. Because even if the application passes the testing stage in a different environment it can be crash. Banks have their own way to prevent this situation. By choosing one or two division they avoid the bad situation such that if the program crashes the bank may cease and it cannot give service think if this happens not just one or two division but all division then the bank's reputation is damaged so in order to prevent this mess they come up with this idea.

#### **3.4.5.Production**

After passing all the stages successfully I reach the last product stage called product. In this stage, I present my project to my colleagues in the company. Again I tell them what my product is and which problem I solved in the company and how I do that but most importantly at the end of this presentation I can animate my program in front of them and it worked free of problems and that means that mt internship is done without any problem.

### **4.CONCLUSIONS**

Throughout mt software training, I exposed many software terms and programs and problem and I learn more about what is a software developer and what jobs does he/she does in his/her career in the real-life industry. Also, I made an inference from the essays, I read as homework in the internship such that which working areas can I work, when I graduated what job can I perform or in my career what can I be such as project manager, developer or etc. Of course, in the industry, I learn that to successfully carry on your career you need to take these positions step by step. During this period I realized that *observation* is the main factor in solving a problem. Also in this period, I need lots of support and I get them from my colleagues in the company their support can be very critical some times even we can say that their help determines the due date of the work you are performing. Moreover, among your colleagues, mostly you are alone to solve the problems you faced, so in this way, I learned to be patient and indirectly that helped me improve my skills such that to discipline myself, take initiative and the ability to solve problems. Besides my social skills are improved because in an environment full of people you need to communicative get help and handle the problem, you can do that by communicating with the people around you, also this period taught me how to talk with your colleagues effectively. Apart from that, this period helped me to sharpen my skills in java such as performing database operations in database tables, later I learned how to read&write to an excel sheet and finally by just using java and some additional libraries I manage to write automatically report as a pdf file and send it via email to the person who is responsible for the job. In addition to this, I learned how to use the SQL database and how to perform efficient *querying* operations in an open-source database program. All this period long I find several things important:

#### **4.1.Time&Goal Management**

In companies, one of the most important things is time management and throughout my one month period I managed to divide my time into efficient pieces thanks to the Agile approach. I divided the work into pieces so in every small period I finished successfully some part of the so in the end when you combine the pieces the will be done. And this helps you psychologically because at end of all sprints you will be finished a job in order to finish the whole job at the end of the period you finish small jobs and you think that I finished one more task and you feel comfortable like divide and conquer method.

#### **4.2.Critical&Analtical Thinking**

In order to solve the problem permanently, we have to analyze our problem detailed way and formulate effective solutions which include critical and analytic approaches related to the problem.

## 5.REFERENCES

- UKEssays.com. (2019). *Agile project management processes*. [online] Available at: <https://www.ukessays.com/essays/management/agile-project-management-processes.php> [Accessed 2 Nov. 2019]
- GradesFixer. (2019). *The Software Development Life Cycle: [Essay Example], 1186 words* GradesFixer. [online] Available at: <https://gradesfixer.com/free-essay-examples/the-software-development-life-cycle/> [Accessed 2 Nov. 2019].

## 6.APPENDIX

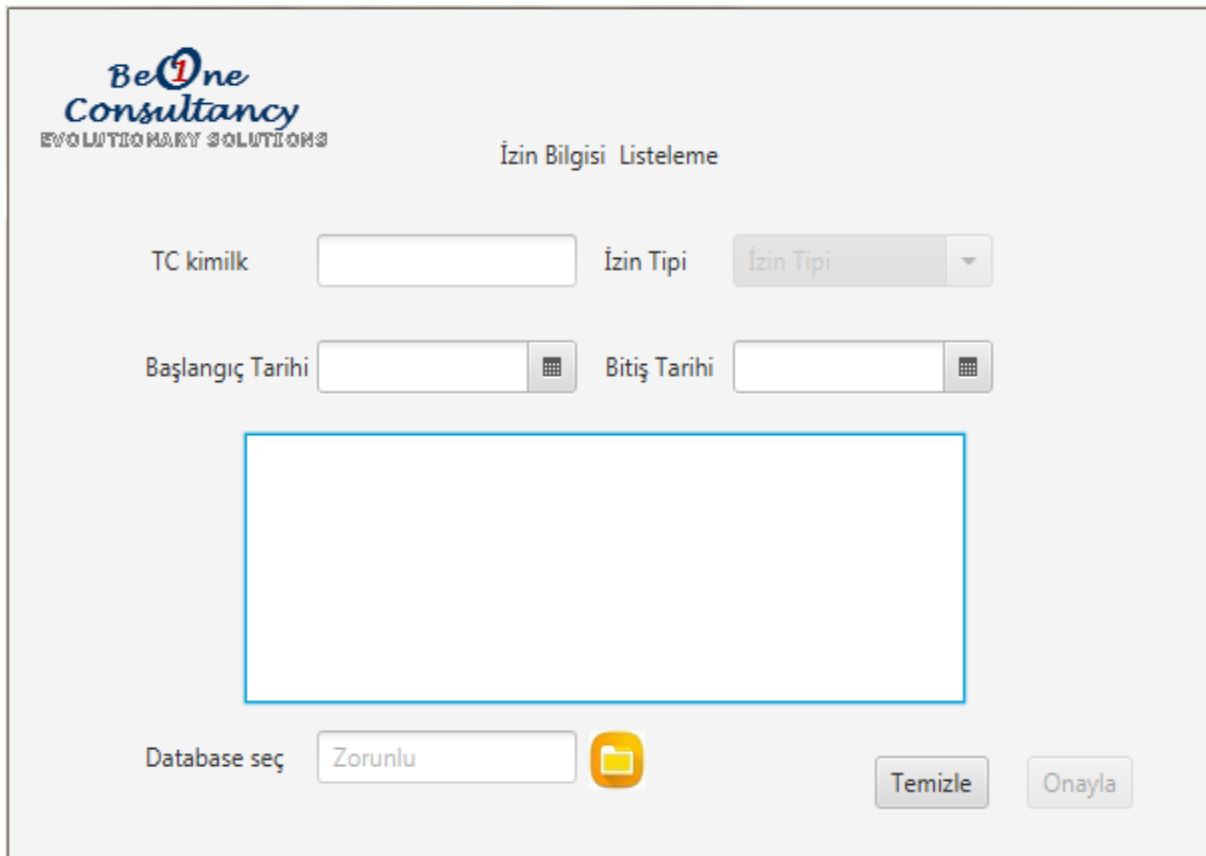


Figure 13, GUI of listing the personnel who took Holiday

In this interface, the user in human resources unit can list the holidays due to these parameters individually or parameters can be chosen in multiple ways.



**BeOne Consultancy**  
EVOLUTIONARY SOLUTIONS

### İzin Belgesi

TC Kimlik	<input type="text" value="Zorunlu"/>	İzin Tipi	<input type="text" value="İzin Seç"/>
Telefon	<input type="text" value="Zorunlu"/>	İzin Dönemi	<input type="text" value="Yıl Seç"/>
İzin Günü	<input type="text" value="Zorunlu"/>	Başlangıç	<input type="text"/>
İzin saati	<input type="text" value="Zorunlu"/>	Bitiş	<input type="text"/>
Adres	<input type="text" value="Zorunlu"/>	Note	<input type="text" value="Ek açıklama"/>
İzin Belgesi	<input type="text" value="Zorunlu"/>	Database	<input type="text" value="Zorunlu"/>



 

Figure 14,GUI of getting Holiday

In this interface user, the personnel of the company gets the holiday and after that this values turn into a pdf request report.

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### Yeni Personel Kaydı

Ad	<input type="text"/>	Medeni Durum	<input type="text" value="Durum"/>
Soyad	<input type="text" value="Soyad"/>	Çocuk Sayısı	<input type="text" value="Çocuk"/>
TC kimlik	<input type="text" value="TC"/>	Bilgi Düzeltme	<input type="radio"/> Düzelt
Tarih Seç	<input type="text"/>	Bilgi Güncelle	<input type="radio"/> Güncelle
Database Seç	<input type="text" value="url"/>	Adli sicil Belgesi	
		Kimlik Fotokopisi	
		İkametgah	
		Resim	

Figure 15,GUI of adding new personnel to the company or updating an existing personnel