PAXI: SOSYAL TAKSİ

ISTANBUL TECHNICAL UNIVERSITY

ISE-305 DATABASE SYSTEMS 2016-2017 SPRING

PROJECT REPORT

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1. PROJECT DESCRIPTION

1.1. Project Introduction

"PAXI: Sosyal Taksi" is a web application and social platform, that allows anyone who wants to travel by taxi to make a more convenient and more reliable taxi choice.

PAXI is developed to ensure smartphone users a safer travel by taxi, reducing the possibilities of any problem that may arise because of taxi drivers. PAXI lets users to search for a taxi plate information, which will enable users to access to the past passenger experiences, comments and ratings related to any taxi registered on the system, and to contribute to their own travel experiences. PAXI also lets its users to add any taxi as favorite as a reference for their future rides.

It is aimed to transform the project into a social platform that grows with user feedback and develops in line with the needs of the users. In future, users will be able to take pictures of the taxis' plates that they want to ride or they can scan the QR codes assigned to a taxi, using the device's camera.

1.2. Project Team & Roles

PAXI is being developed by a team made up of students of Istanbul Technical University, Information Systems Engineering department.

- Halil Onur ARSLANTURK -> Program Developer / Computer Vision Developer
- Kerem URMAN -> Database Design
- Tolgahan VAHAPLAR -> Interface Design / Quality Assurance

1.3. Project Deliverables

- Creating a taxi database with particular information related to taxis.
- Creating a social platform accessible by creating a new account.
- Providing anonymity by not showing personal information of users.
- Providing users search methods to find taxi information.
- Giving users ability to share their experiences by rating and commenting any taxi.
- Giving users ability to add taxis their favorite list for future reference.

1.4. Project Milestones

- Designate business plan and documentation. (March, 2017)
- Database creation according to the design. (April, 2017)
- Designate UI design and requirements. (April, 2017)
- Website implementation. (May, 2017)
- Connecting components and testing. (May, 2017)

1.5. Project Exclusions

- Multimedia research and implementation of additional search methods (WIP)
- Marketing (TBD)

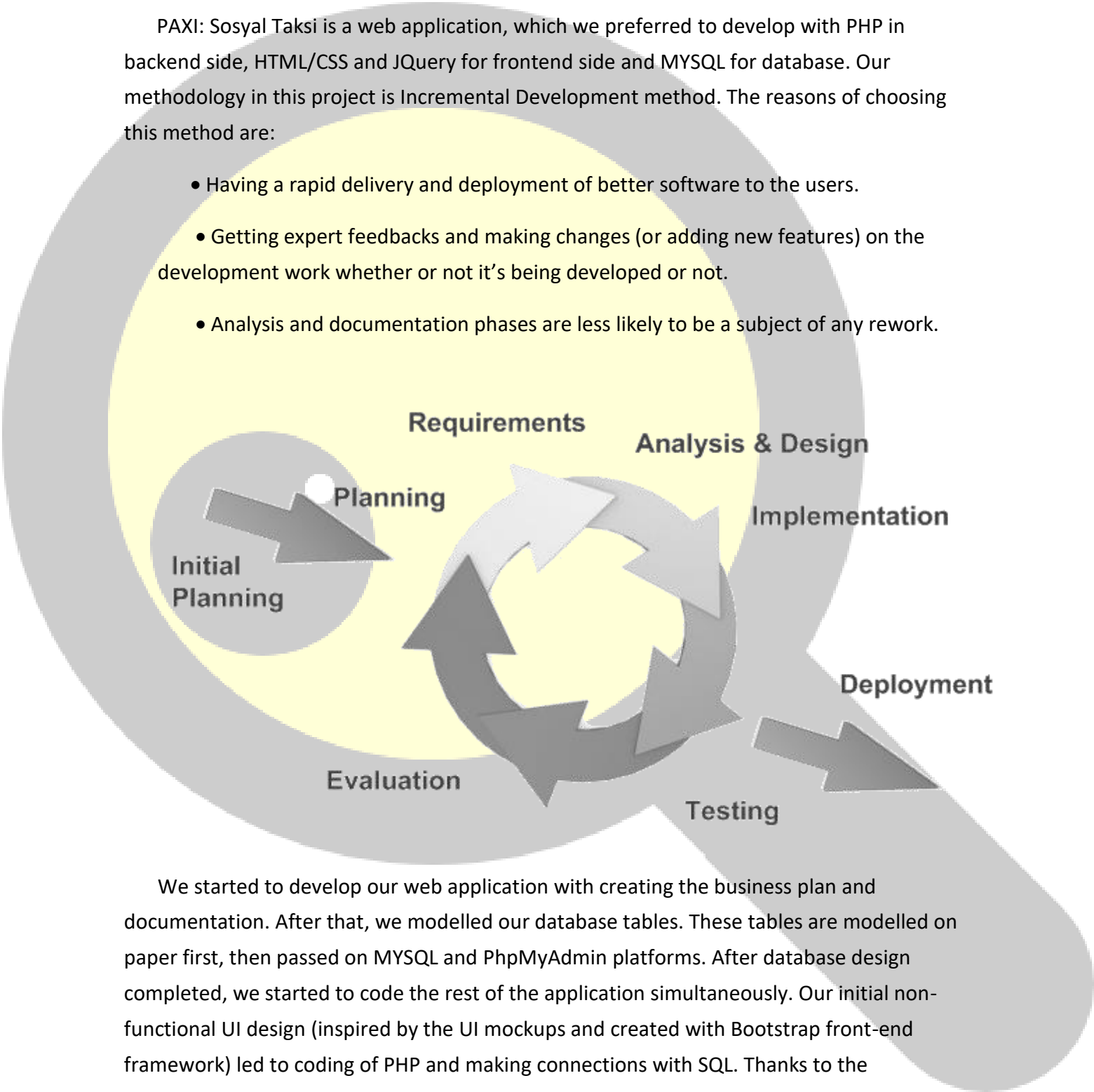
1.6. Project Risks

Project risks are identified and aversion methods are stated in the “PAXI: Sosyal Taksi: Project Risks” documentation.

2. APPLICATION INFORMATION

PAXI: Sosyal Taksi is a web application, which we preferred to develop with PHP in backend side, HTML/CSS and JQuery for frontend side and MYSQL for database. Our methodology in this project is Incremental Development method. The reasons of choosing this method are:

- Having a rapid delivery and deployment of better software to the users.
- Getting expert feedbacks and making changes (or adding new features) on the development work whether or not it's being developed or not.
- Analysis and documentation phases are less likely to be a subject of any rework.



We started to develop our web application with creating the business plan and documentation. After that, we modelled our database tables. These tables are modelled on paper first, then passed on MYSQL and PhpMyAdmin platforms. After database design completed, we started to code the rest of the application simultaneously. Our initial non-functional UI design (inspired by the UI mockups and created with Bootstrap front-end framework) led to coding of PHP and making connections with SQL. Thanks to the Incremental Development Method we chose, continuous testing and evaluation phases shaped our project and included more features phase by phase.

3. DATABASE DESIGN

3.1. Normalization

Figure: 1NF Form

User	Taxi
UserID	TaxiID
Username	Plate
Password	Manifacturer
Name	Model
Surname	ModelYear
Age	TaxiRating
Email	TaxiComment
Gender	CommentRating
	CommentDate
	StationName
	StationCity
	StationCountry
	StationZipcode
	StationBuildingNo
	StationPhoneNo

Normalization is the process of organizing the columns (attributes) and tables (relations) of a relational database to reduce data redundancy and improve data integrity. We use normalization to eliminate data redundancy and anomalies that might be happen during insertion, update and selection operations. This way we'll discard any redundant data and ensure that data dependencies make sense.

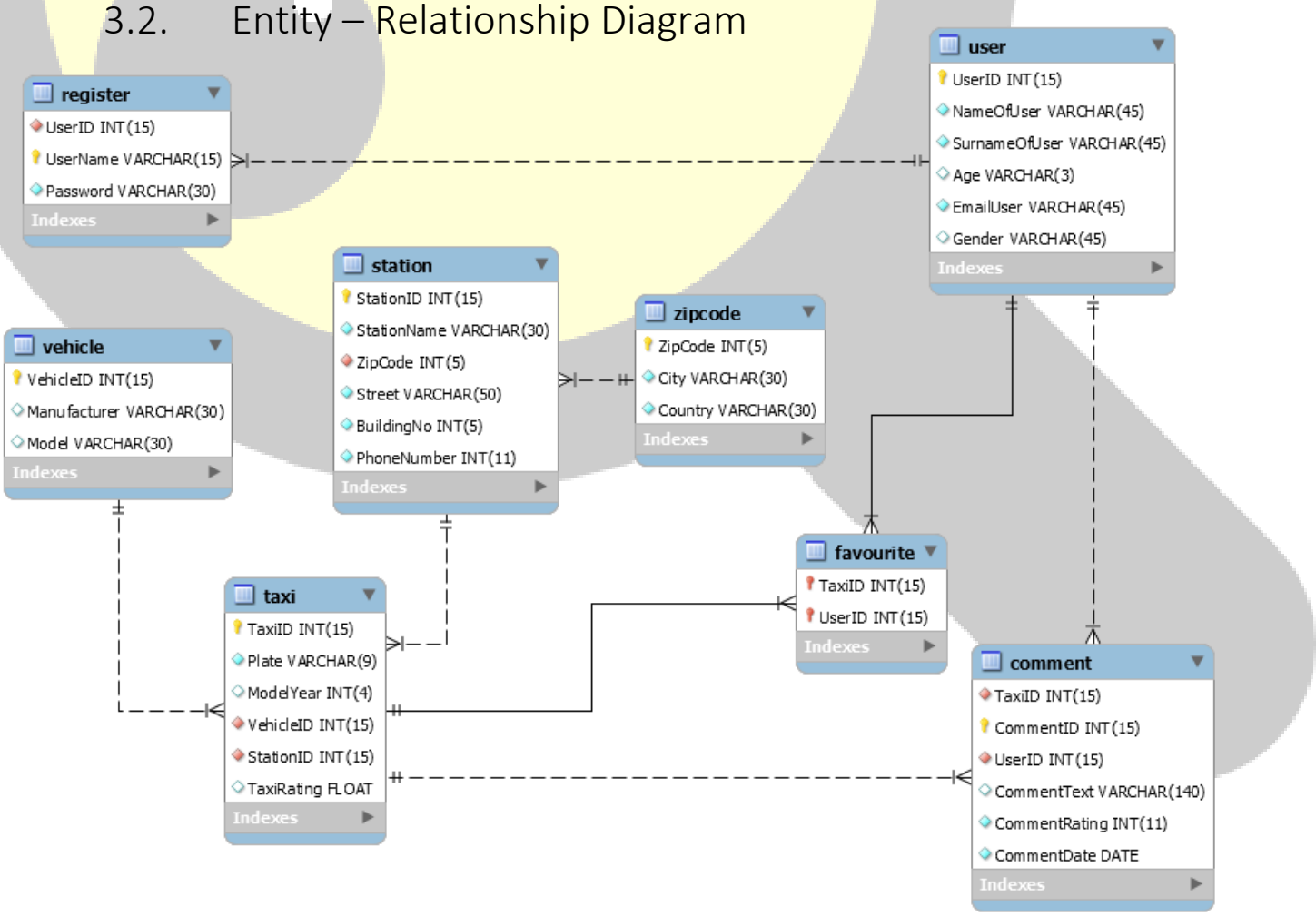
At the beginning, we have two tables named User and Taxi (Table names are bolt, and entities are represented below them). Both entities include many characteristics and features in their tables, but this representation is not appropriate. Thus, at the first step we're going to divide our 1NF table to 2NF table.

Figure: 2NF Form

Register	User	Taxi	Vehicle	Station	Comment
UserID	UserID	TaxiID	VehicleID	StationID	CommentID
Username	Name	Plate	Manifacturer	StationName	TaxiID
Password	Surname	ModelYear	Model	Zipcode	UserID
	Age	TaxiRating		City	Comment
	Email	VehicleID		Country	CommentRating
	Gender	StationID		Street	Date
				BuildingNo	
				PhoneNo	

This representation is better, but we can still separate these tables and make the connections better. For example, “City” and “Country” are entities of “Zipcode”, and we can discard more redundant data via separating them from the table. After adding our “Favorite” table, we get the final form of our table, which is 3NF. We will show our database in Entity-Relationship Diagram form in the next section.

3.2. Entity – Relationship Diagram



3.3. Database Samples

Images of database samples which we filled manually and/or via application:

Taxi Table

	TaxiID	Plate	ModelYear	VehicleID	StationID	TaxiRating
Edit Copy Delete	10	34 TCY 28	1998	1	1	3.6
Edit Copy Delete	11	34 TRS 56	2008	2	2	5
Edit Copy Delete	12	34 THS 28	2006	3	3	2.2
Edit Copy Delete	13	34 THY 55	2010	4	4	1.2
Edit Copy Delete	14	34 TSU 10	2015	5	5	3.5
Edit Copy Delete	15	34 TKF 20	2015	6	6	4.5
Edit Copy Delete	16	34 TJK 03	2017	7	7	4.5

Register Table

	UserID	UserName	Password
Edit Copy Delete	11	AtesdeYanayim	1234567
Edit Copy Delete	5	canan1992	23451
Edit Copy Delete	4	Cansu94	35267
Edit Copy Delete	7	ege1453	54321
Edit Copy Delete	2	honurbey	32546
Edit Copy Delete	1	kebelekkerem	12345
Edit Copy Delete	18	Lena91	123123
Edit Copy Delete	12	sevdaninSonVuru	123123
Edit Copy Delete	8	talatpasa	32145
Edit Copy Delete	3	tolgaHan	36785
Edit Copy Delete	6	ugur1903	13542

User Table

	UserID	NameOfUser	SurnameOfUser	Age	EmailUser	Gender
Edit Copy Delete	1	Kerem	urman	24	kurman1@binghamton.edu	Male
Edit Copy Delete	2	Halil	arslan	25	harslan1@binghamton.edu	Male
Edit Copy Delete	3	Tolga	Vahap	24	tolga1@binghamton.edu	Male
Edit Copy Delete	4	Cansu	Kaya	22	cansu1@binghamton.edu	Female
Edit Copy Delete	5	Canan	Ates	27	cananes@bogazici.edu	Female
Edit Copy Delete	6	Ugur	Yilmaz	23	ugurlu@hotmail.com	Male
Edit Copy Delete	7	Ege	Konuk	23	egekok@gmail.com	Male
Edit Copy Delete	8	Talat	Genc	34	tlt123@gmail.com	
Edit Copy Delete	11	elcin	cavus	22	ecavus1@binghamton.edu	Male
Edit Copy Delete	12	Furkan	Dindar	23	fdindar1@binghamton.edu	Male
Edit Copy Delete	18	Lena	Oxton	26	lena91@hotmail.com	Female

Vehicle Table

	VehicleID	Manufacturer	Model
Edit Copy Delete	1	opel	astra
Edit Copy Delete	2	opel	zafira
Edit Copy Delete	3	opel	meriva
Edit Copy Delete	4	opel	corsa
Edit Copy Delete	5	fiat	doblo
Edit Copy Delete	6	fiat	doblo
Edit Copy Delete	7	fiat	tourneo

Station Table

	StationID	StationName	ZipCode	Street	BuildingNo	PhoneNumber
Edit Copy Delete	1	GultepeTaxi	34668	gultepe	3	2123532534
Edit Copy Delete	2	SelimiyeTaxi	34669	elma	11	4678900
Edit Copy Delete	3	4.MuratTaxi	34667	fevzipasa	23	2124589304
Edit Copy Delete	4	BalcovaTaxi	34666	Sair Nesimi	34	2395892
Edit Copy Delete	5	CincinTaxi	34665	Nazımpasa	45	5679459
Edit Copy Delete	6	KagithaneTaxi	34662	Dergah	45	2473456
Edit Copy Delete	7	KosuyoluTaxi	34661	validebag	13	4556783

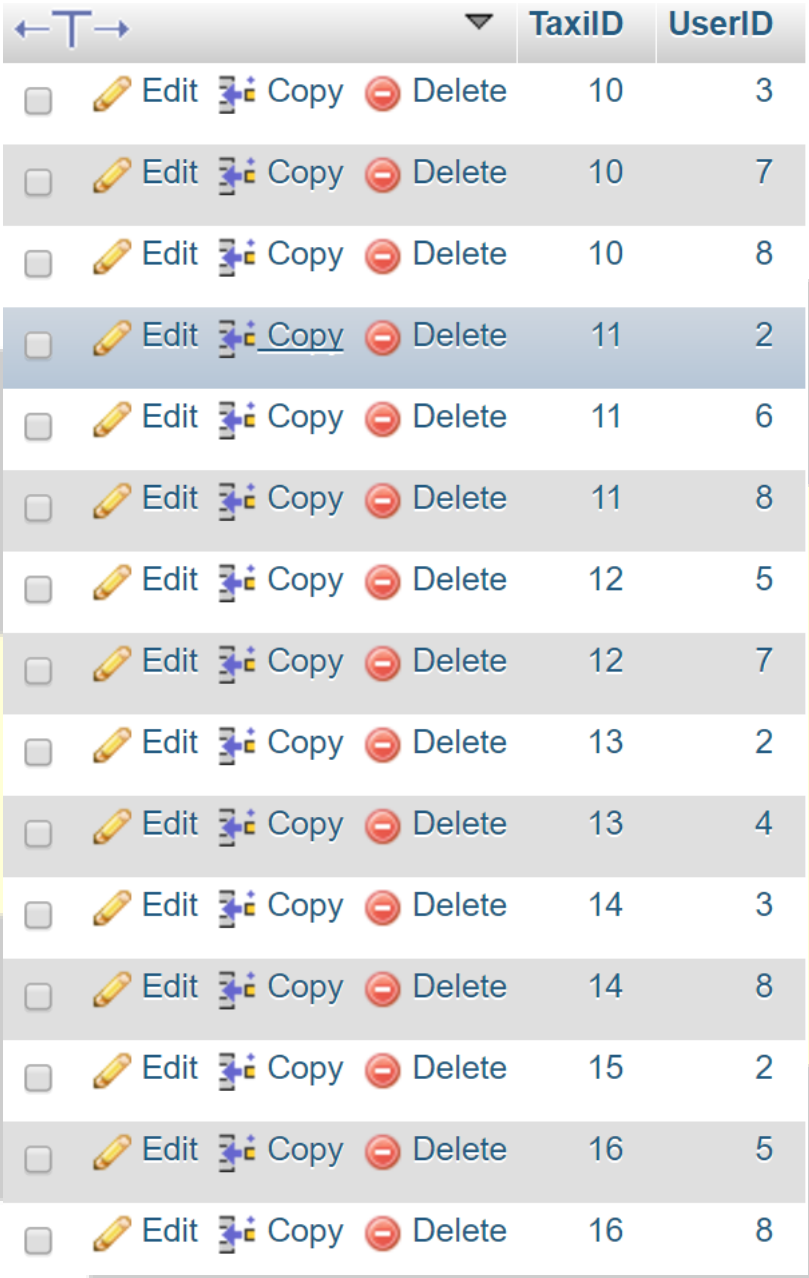
Zipcode Table

	ZipCode	City	Country
Edit Copy Delete	34661	Istanbul	Kosuyolu
Edit Copy Delete	34662	Istanbul	Kagithane
Edit Copy Delete	34665	Ankara	Kizilay
Edit Copy Delete	34666	İzmir	Karsiyaka
Edit Copy Delete	34667	Kocaeli	Kocaeli
Edit Copy Delete	34668	Istanbul	Besiktas
Edit Copy Delete	34669	Eskisehir	Cincin

Comments Table

	TaxiID	CommentID	UserID	CommentText	CommentRating	CommentDate
Edit Copy Delete	13	3	1	Cok konforlu guzel bir surus keyfi yasadim	3	2017-03-05
Edit Copy Delete	14	4	2	Kibar bir beyefendi	4	2017-03-03
Edit Copy Delete	15	5	3	Dikkatli bir surucuydu	3	2017-02-05
Edit Copy Delete	14	6	4	Navigasyon kullanmadı yolu uzattı	5	2017-06-18
Edit Copy Delete	10	7	5	Taximetre olması gerektiğinden fazla yazdı. Galiba...	5	2017-05-05
Edit Copy Delete	16	8	2	Cok konforlu guzel bir surus keyfi yasadim	5	2017-07-07
Edit Copy Delete	11	9	8	Berbat bir surucu. Yuregim agzıma geldi	2	2017-03-15
Edit Copy Delete	12	10	7	Taxici butun yol konustu. Beni rahatsız etti	4	2017-06-11
Edit Copy Delete	14	11	8	guzel bir surus keyfi yasadim. Araba da güzeldi	3	2017-02-04
Edit Copy Delete	10	12	1		0	2017-02-06
Edit Copy Delete	10	13	8	Bu bir denemedir.	5	2017-05-16
Edit Copy Delete	10	14	8	bu ikinci denemedir	1	2017-05-16

Favorites Table



	TaxiID	UserID
Edit Copy Delete	10	3
Edit Copy Delete	10	7
Edit Copy Delete	10	8
Edit Copy Delete	11	2
Edit Copy Delete	11	6
Edit Copy Delete	11	8
Edit Copy Delete	12	5
Edit Copy Delete	12	7
Edit Copy Delete	13	2
Edit Copy Delete	13	4
Edit Copy Delete	14	3
Edit Copy Delete	14	8
Edit Copy Delete	15	2
Edit Copy Delete	16	5
Edit Copy Delete	16	8

3.4. Query Samples

Here are some example queries we also used to develop our application:

SELECT user.NameOfUser,comment.CommentText

FROM paxi.user JOIN paxi.comment ON user.UserID=comment.UserID

WHERE User.UserID=2

(Used to find one particular person's comments)

NameOfUser	CommentText
Halil	Kibar bir beyefendi
Halil	Cok konforlu guzel bir surus keyfi yasadim

SELECT AVG(taxi.TaxiRating),station.StationName

FROM paxi.station JOINpaxi.taxi ON station.StationID=taxi.StationID

(Average taxi rating of a station)

AVG(taxi.TaxiRating)	StationName
3.585714272090367	GultepeTaxi

SELECT taxi.Plate,station.StationName

FROM paxi.station JOIN paxi.taxi ON station.StationID=taxi.StationID

(Taxi plates and coresponding stations)

Plate	StationName
34 TCY 28	GultepeTaxi
34 TRS 56	SelimiyeTaxi
34 THS 28	4.MuratTaxi
34 THY 55	BalcovaTaxi
34 TSU 10	CincinTaxi
34 TKF 20	KagithaneTaxi
34 TJK 03	KosuyoluTaxi

SELECT taxi.Plate,user.NameOfUser

FROM paxi.favourite JOIN paxi.user ONUser.UserID=favourite.UserID JOIN paxi.taxi ON taxi.TaxiID=favourite.TaxiIDWHERE User.UserID=1

(Plates of favorite taxis of a user)

Plate	NameOfUser
34 THY 55	Kerem

SELECT taxi.TaxiID,taxi.plate,vehicle.Manufacturer,vehicle.Model,station.StationName,taxi.TaxiRating

FROM paxi.taxi JOIN paxi.vehicle ON vehicle.VehicleID=taxi.VehicleID

JOIN paxi.station ON taxi.StationID=Station.stationID

WHERE taxi.TaxiID=1 ;

(Used in taxi information page)

	TaxiID	plate	Manufacturer	Model	StationName	TaxiRating
	1	34TCY28	opel	astra	GultepeTaxi	4.2