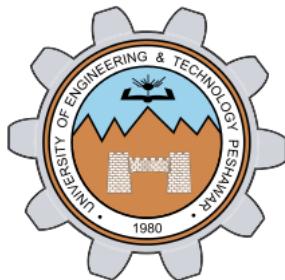


Database Management Systems

Project Report



Sawari - An online bus booking platform

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1. Introduction

Sawari, Urdu word for a ‘ride’, is an online bus booking and viewing platform for Pakistan. This is a web application which lists bus schedules and fares from different service providers and allows the user to make a booking.

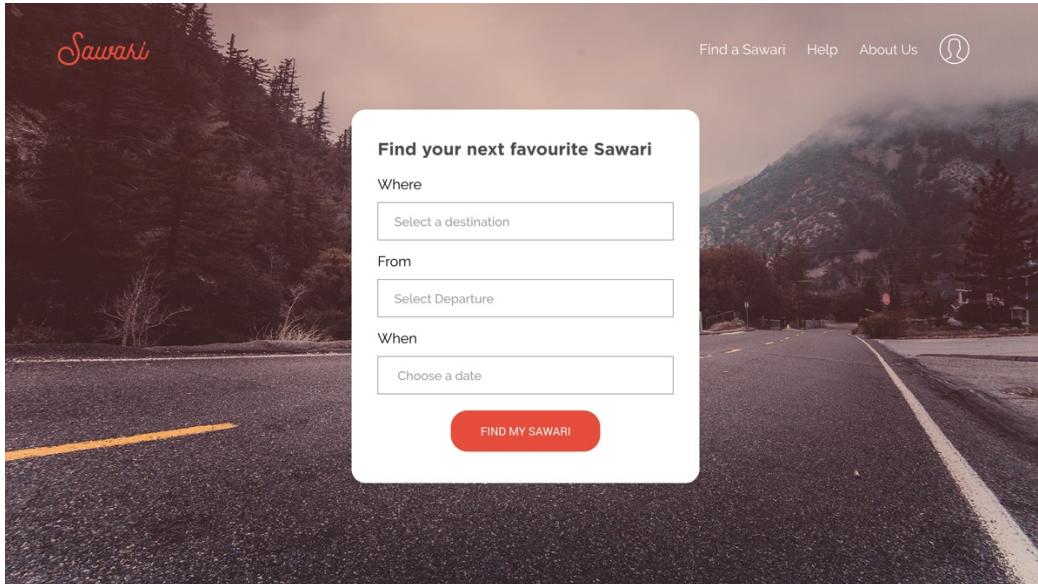


Image 1 Sawari's Homepage

2. Group Members

Name	Role	Responsibilities
Atif Ur Rahman	Front End Designer & UX Researcher	Brainstorm project's brand identity and give it an aesthetic appeal.
Hamza Zeb	Backend Developer & Laravel Expert	Implement database & handle backend development and maintenance.

3. Project Summary

Sawari is the go to platform for users looking to find their ideal rides, based on their budget or expected facilities. The project is a capstone project for the undergraduate course ‘Database Management Systems’ offered at Department of Computer Systems Engineering.

The project required extensive User Experience research and Visual Design principles to build the front end, while the back end was developed based on the rich concepts learned in the course. The backend solution was built using Laravel Framework.

4. Design

The design phase was the essential phase to commence the project. This allowed the developer to have a clear roadmap of the development phase, helped in designing a clear and accurate Entity Relationship Diagram all the while adding an aesthetic and user-friendly touch to the web app. The design phase was further divided into the following steps:

a. Wireframing

Wireframing was the first step to craft a skeleton for the platform, based on the results from competitive analysis and initial user feedback.

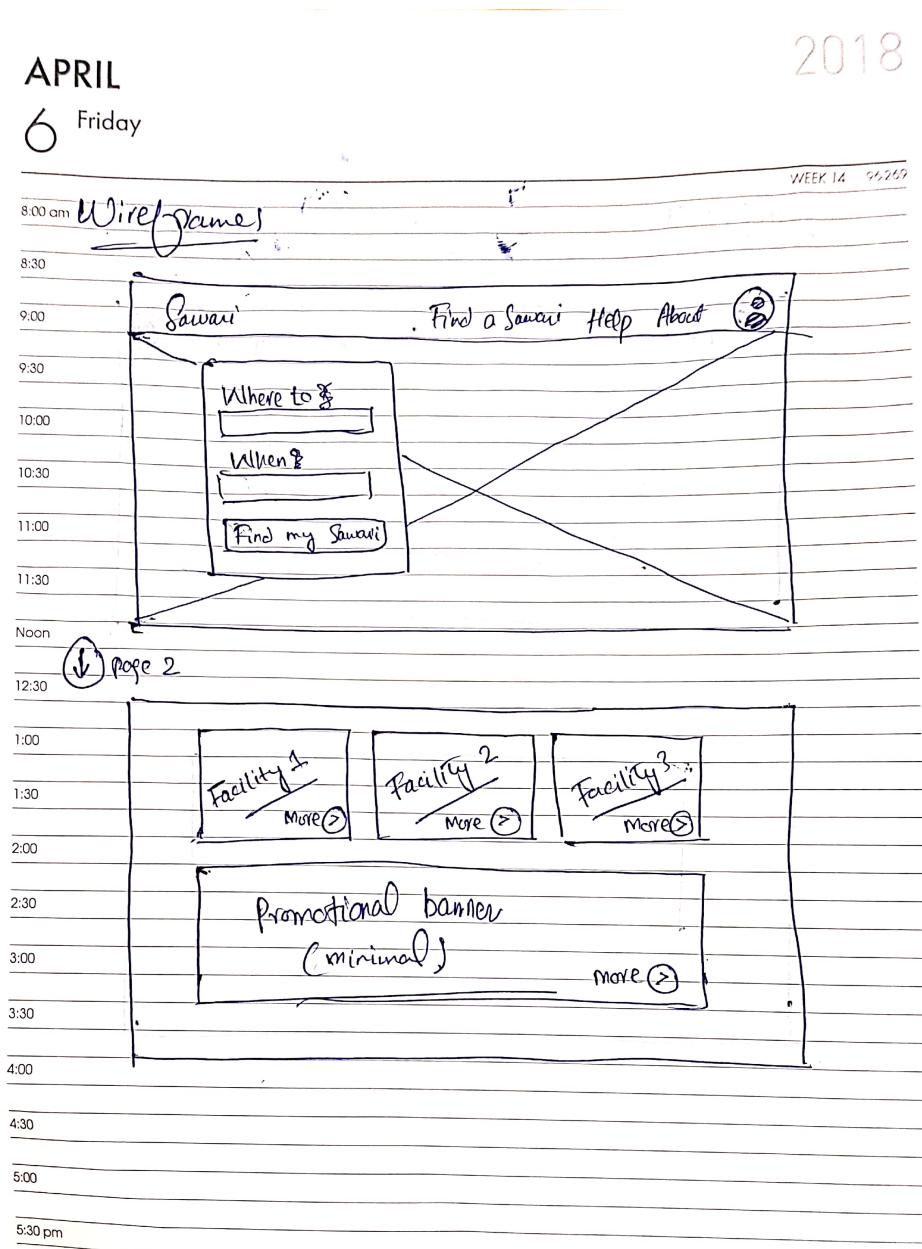


Image 2 Wireframes of Sawari's homepage

b. Prototyping

The second step was to convert the handmade wireframe sketches into Computer Graphics through an industry standard software and provide a realistic interface mockup.

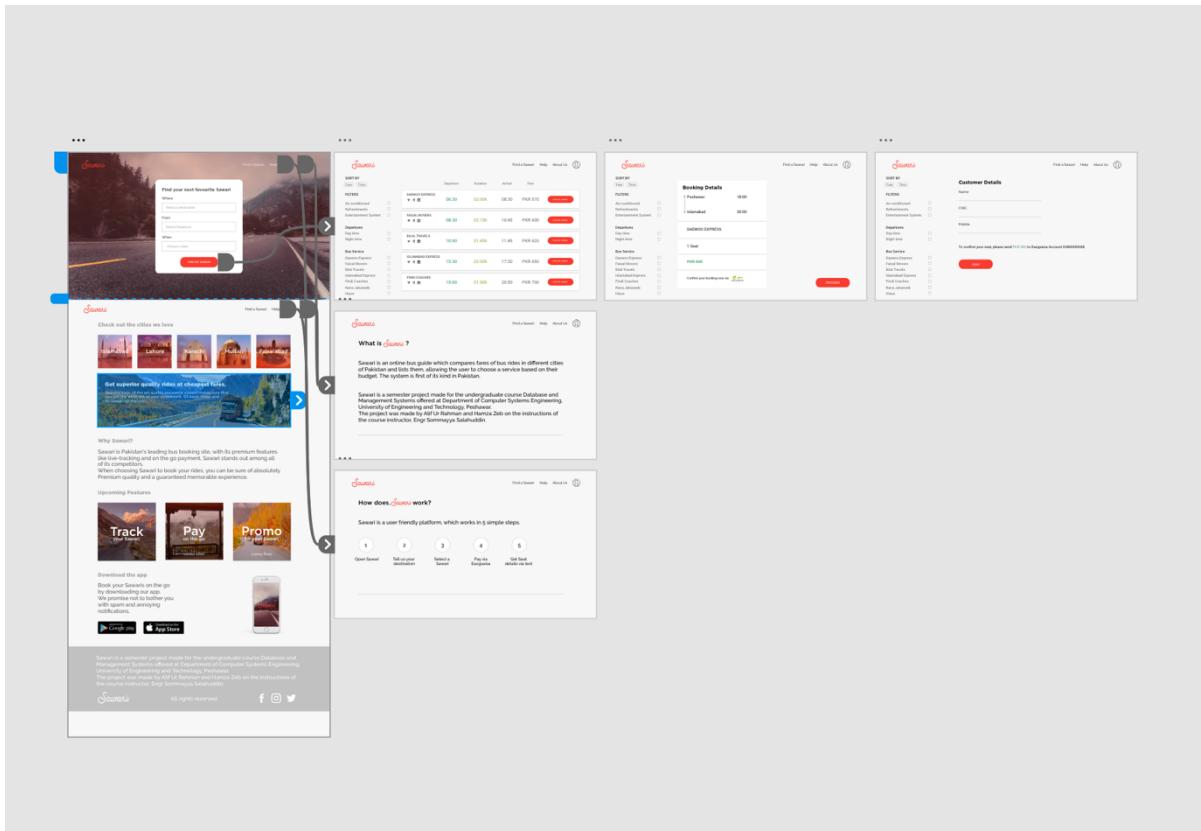
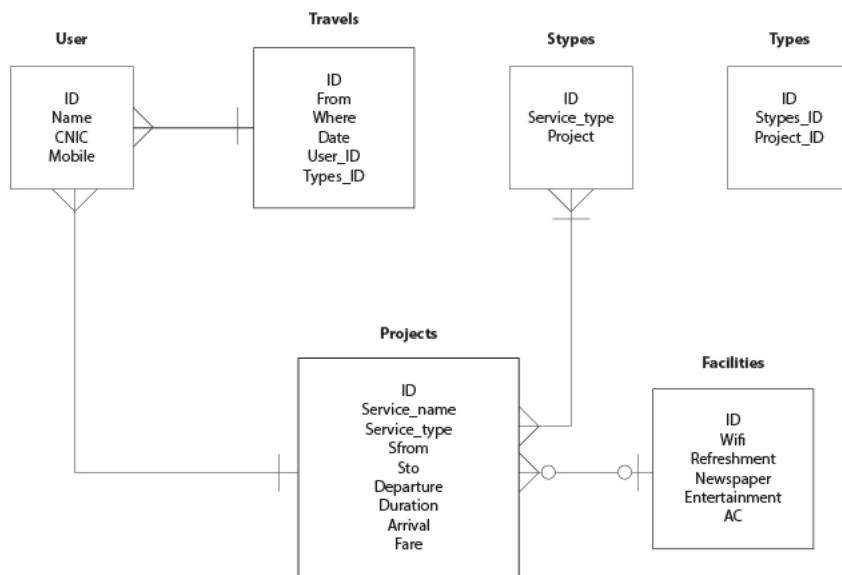


Image 3 A preview of the prototype in Adobe XD

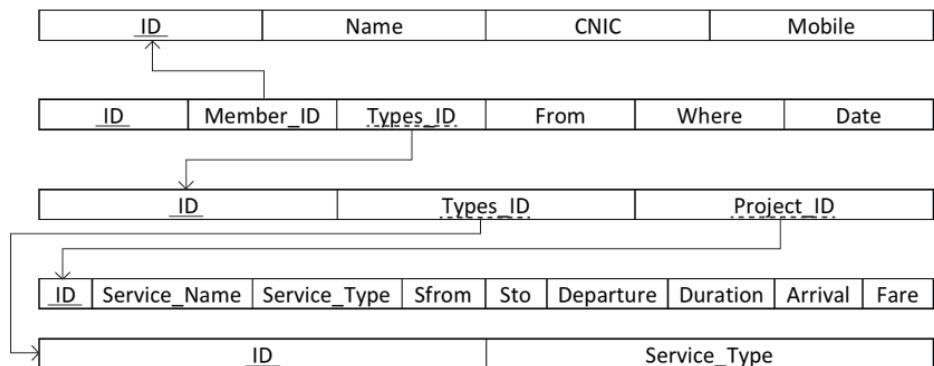
5. Development

The development phase was the most crucial and demanding phase of the development cycle of Sawari. The group faced challenges like identifying and understanding different features of Laravel Framework to use those in implementing the design. The phase required extensive learning and command over the subject to come up with an effective solution. Development phase was further divided into the following subcategories:

a. Entity Relationship Diagram



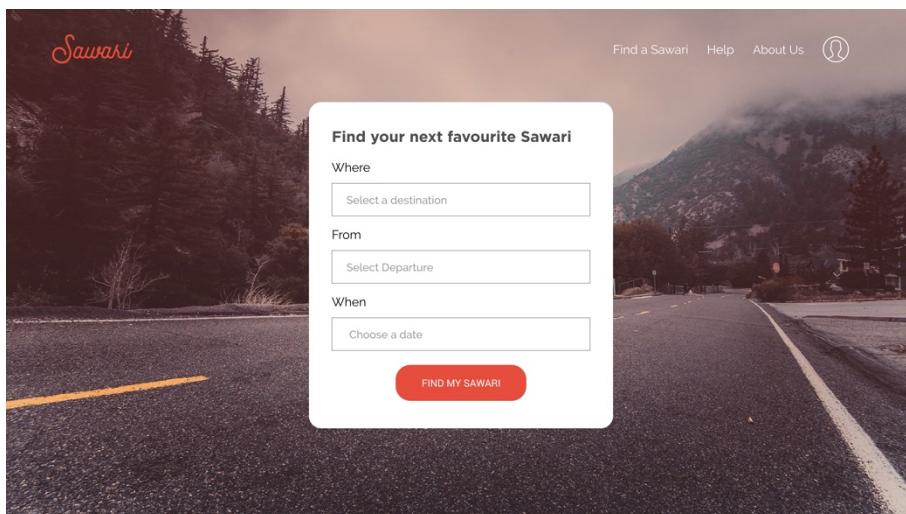
b. Normalized Form



c. Business Rules

- i. User searches for available buses by providing destination, arrival and date.
- ii. Buses are listed and sorted according to the service providers.
- iii. A bus service may be a bus, hiace or cargo.
- iv. Each list entity shows Departure, Duration, Arrival and Fare.
- v. A user must provide full name, CNIC number and mobile number, to book a seat.
- vi. User is shown a digital receipt and the payment method.

d. Front View Design



Screen 1 Home Screen

SORT BY	Departure	Duration	Arrival	Fare
Fare	DAEWOOD EXPRESS 06:30	02:00h	08:30	PKR 570
Ratings	FAISAL MOVERS 08:30	02:15h	10:45	PKR 600
Seats	BILAL TRAVELS 10:00	01:45h	11:45	PKR 620
	ISLAMABAD EXPRESS 15:30	02:00h	17:30	PKR 650
	PINDI COACHES 19:00	01:50h	20:50	PKR 700

Screen 2 Search Results for a destination

Booking Details

From	To	Time
Peshawar		18:00
	Islamabad	20:00

DAEWOOD EXPRESS

1 Seat

PKR 600

Confirm your booking now via easypaisa

PROCEED

Screen 3 Receipt

Customer Details

Name	
CNIC	
Mobile	

To confirm your seat, please send **PKR 600** to Easypaisa Account 03460659068

OKAY

Screen 4 User Details

e. Backend development

Laravel MVC (Model View Controller) was used to implement the design. A panel was developed to add data into the database.

```

32
33     public function booking()
34     {
35         $projects = Project::all();
36         $facilities = Facility::all();
37         $travels1 = Travel::latest()->first()->from;
38         $travels2 = Travel::latest()->first()->where;
39         $services = Service::all();
40         $users = User::all();
41
42         return view('booking', compact('projects', 'facilities', 'travels1', 'travels2', 'services', 'users'));
43
44     }
45
46     public function customer()
47     {
48         $projects = Project::all();
49         $services = Service::all();
50
51         return view('customer', compact('projects', 'services'));
52     }
53
54     public function help()
55     {
56         return view('help');
57     }
58
59     public function receipt()
60     {
61
62         $projects = Project::all();
63         $facilities = Facility::all();
64

```

Image 4 Preview of a controller

	id	service_name	service_type	sfrom	sto	departure	duration	arrival	fare	created_at	updated_at
7	daewoo express	Bus. Hiace, Cargo	abbottabad	islamabad	07:00	02:00	09:00	500	2019-07-01 23:16:34	2019-07-01 23:16:34	
6	daewoo express	Bus. Hiace, Cargo	abbottabad	lahore	07:00	09:00	16:00	1300	2019-07-01 23:15:57	2019-07-01 23:15:57	
5	daewoo express	Bus. Hiace, Cargo	abbottabad	peshawar	06:00	03:00	07:20	500	2019-07-01 23:14:57	2019-07-01 23:14:57	
8	daewoo express	Bus. Hiace, Cargo	abbottabad	karachi	07:00	10:00	20:00	3000	2019-07-01 23:13:59	2019-07-01 23:13:59	
9	niazi express	Bus. Hiace	peshawar	abbottabad	08:00	03:00	11:00	400	2019-07-01 23:19:52	2019-07-01 23:19:52	
10	niazi express	Bus. Hiace	peshawar	lahore	07:00	13:00	1200	2019-07-01 23:28:29	2019-07-01 23:28:29		
11	niazi express	Bus. Hiace	peshawar	islamabad	07:00	02:00	09:00	2000	2019-07-01 23:22:29	2019-07-01 23:22:29	
12	niazi express	Bus. Hiace	peshawar	karachi	07:00	10:00	19:00	3200	2019-07-01 23:22:09	2019-07-01 23:22:09	
13	daewoo express	Bus. Hiace	peshawar	karachi	05:00	14:00	19:00	3500	2019-07-01 23:24:02	2019-07-01 23:24:02	
14	bilal travels	Bus. Hiace	peshawar	karachi	05:00	14:00	19:00	4000	2019-07-01 23:24:22	2019-07-01 23:24:22	
15	moterway express	Bus. Hiace	peshawar	karachi	06:00	14:00	19:00	4000	2019-07-01 23:24:37	2019-07-01 23:24:37	
16	bilal travels	Bus. Hiace	peshawar	abbottabad	06:00	02:30	10:30	1000	2019-07-01 23:24:37	2019-07-01 23:24:37	
17	bilal travels	Bus. Hiace	peshawar	islamabad	08:00	02:30	10:30	330	2019-07-01 23:26:34	2019-07-01 23:26:34	
18	moterway express	Bus. Hiace	peshawar	islamabad	08:00	02:30	10:30	450	2019-07-01 23:26:50	2019-07-01 23:26:50	
19	moterway express	Bus. Hiace, Cargo	peshawar	lahore	07:00	10:00	11:00	400	2019-07-01 23:26:50	2019-07-01 23:26:50	
20	bilal travels	Bus. Hiace, Cargo	peshawar	lahore	07:00	06:00	13:00	1300	2019-07-01 23:28:08	2019-07-01 23:28:08	
21	moterway express	Hiace, Cargo	peshawar	lahore	07:00	06:00	13:00	1400	2019-07-01 23:28:44	2019-07-01 23:28:44	
22	daewoo express	Bus. Hiace, Cargo	peshawar	abbottabad	07:00	03:30	10:30	500	2019-07-01 23:29:57	2019-07-01 23:29:57	
23	bilal travels	Bus. Hiace	peshawar	abbottabad	07:00	10:00	11:00	500	2019-07-01 23:31:00	2019-07-01 23:31:00	
24	moterway express	Hiace, Cargo	peshawar	abbottabad	06:00	03:00	09:00	600	2019-07-01 23:31:59	2019-07-01 23:31:59	
25	niazi express	Hiace	abbottabad	karachi	06:00	13:00	19:00	3600	2019-07-01 23:33:13	2019-07-01 23:33:13	
26	bilal travels	Bus. Hiace	abbottabad	karachi	08:00	12:00	20:00	4000	2019-07-01 23:33:59	2019-07-01 23:33:59	
27	moterway express	Bus. Hiace	abbottabad	karachi	08:00	10:00	14:00	4000	2019-07-01 23:34:05	2019-07-01 23:34:05	
28	niazi express	Bus. Hiace	abbottabad	islamabad	06:00	03:00	09:00	300	2019-07-01 23:36:05	2019-07-01 23:36:05	
29	bilal travels	Bus. Hiace	abbottabad	islamabad	08:00	03:00	11:00	350	2019-07-01 23:36:31	2019-07-01 23:36:31	
30	moterway express	Hiace	abbottabad	islamabad	07:00	02:30	09:30	450	2019-07-01 23:37:09	2019-07-01 23:37:09	
31	niazi express	Hiace, Cargo	abbottabad	karachi	07:00	10:00	11:00	400	2019-07-01 23:37:09	2019-07-01 23:37:09	
32	moterway express	Bus. Hiace, Cargo	abbottabad	lahore	06:00	06:00	12:00	1450	2019-07-01 23:39:42	2019-07-01 23:39:42	
33	bilal travels	Bus. Hiace, Cargo	abbottabad	lahore	09:00	06:30	15:30	1200	2019-07-01 23:40:28	2019-07-01 23:40:28	
34	niazi express	Bus. Hiace	abbottabad	peshawar	06:00	02:30	09:30	400	2019-07-01 23:41:30	2019-07-01 23:41:30	
35	moterway express	Bus. Hiace, Cargo	abbottabad	karachi	07:00	10:00	11:00	400	2019-07-01 23:41:30	2019-07-01 23:41:30	
36	moterway express	Hiace	abbottabad	peshawar	05:00	03:00	08:00	600	2019-07-01 23:42:35	2019-07-01 23:42:35	
37	moterway express	Hiace	islamabad	peshawar	03:00	08:00	500	2019-07-01 23:47:27	2019-07-01 23:47:27		
38	niazi express	Hiace	islamabad	peshawar	08:00	03:00	11:10	400	2019-07-01 23:48:11	2019-07-01 23:48:11	
39	bilal travels	Hiace, Cargo	abbottabad	karachi	07:00	10:00	11:00	3000	2019-07-01 23:49:06	2019-07-01 23:49:06	
40	bilal travels	Hiace, Cargo	karachi	abbottabad	06:00	13:00	19:00	4000	2019-07-01 23:49:55	2019-07-01 23:49:55	
41	faisal movers	Hiace, Cargo	lahore	peshawar	06:00	07:00	13:00	2000	2019-07-01 23:52:10	2019-07-01 23:52:10	
42	faisal movers	Hiace, Cargo	abbottabad	islamabad	07:00	03:00	10:00	4300	2019-07-01 23:53:39	2019-07-01 23:53:39	

Image 5 Listed Services