EzParking

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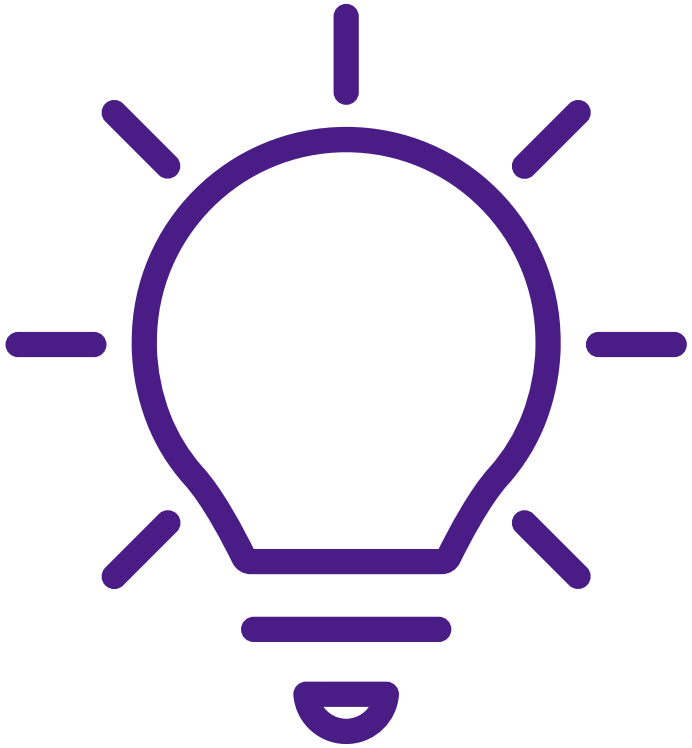
Initial Idea

The objective of this project is to create a distributed parking sharing application that enables users to find and share parking spaces in urban areas with minimal reliance on centralized servers. The system fosters a community-driven approach to solving the challenge of:

- **finding** available parking,
- **reducing** traffic congestion and environmental impact,
- **promoting** collaboration among users.




User
Stories

Account Managment

Resident Functionalities

Parking Search and Driver’s functionalities

Booking and Payment Systems

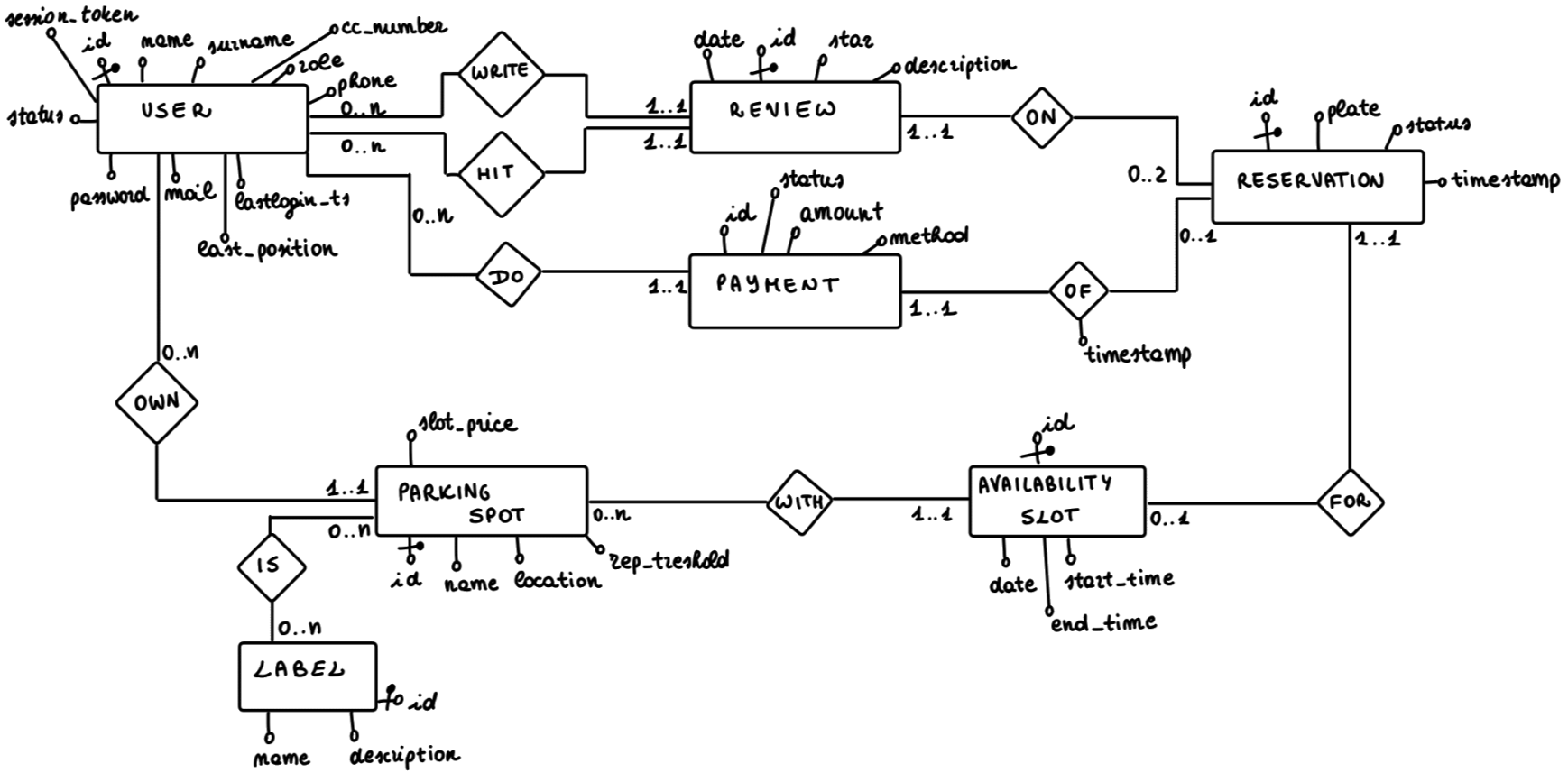
Notification System

Reputation and Rating Systems

Admin Functionalities

Software estimation

Sketch Diagram



Function Points

- 7 ILFs
- 26 Main Functions
- 140 UFP

Unadjusted FP	140

No.	Module	Function Name	Description	Type	DET	RET / FTR	Complexity	FP	Adjust %	FP adjusted
1	Files	USER		ILF	13	1	Low	7		**7**
2	Files	PARKING_SPOT		ILF	6	1	Low	7		**7**
3	Files	RESERVATION		ILF	6	1	Low	7		**7**
4	Files	AVAILABILITY_SLOT		ILF	5	1	Low	7		**7**
5	Files	PAYMENT		ILF	7	1	Low	7		**7**
6	Files	REVIEW		ILF	7	1	Low	7		**7**
7	Files	LABEL		ILF	5	1	Low	7		**7**
8	Admin Functions	View User List		EQ	3	1	Low	3		**3**
9	Admin Functions	Search Users		EI	2	1	Low	3		**3**
10	Admin Functions	Access User Details		EQ	9	1	Low	3		**3**
11	Admin Functions	Enable/Disable Account		EI	2	1	Low	3		**3**
12	Admin Functions	Notification Enable/Disable		EQ	2	1	Low	3		**3**
13	Users Functions	User Registration		EI	6	1	Low	3		**3**
14	Users Functions	Notification Registration		EQ	2	1	Low	3		**3**
15	Users Functions	Login		EI	2	1	Low	3		**3**
16	Users Functions	Logout		EI	1	1	Low	3		**3**
17	Users Functions	Edit Personal Data		EI	8	1	Low	3		**3**
18	Users Functions	View User Dashboard (with reviews)		EO	17	4	High	7		**7**
19	Users Functions	Notification Account Change		EQ	2	1	Low	3		**3**
20	Users Functions	Rate a Resident/Driver		EI	2	1	Low	3		**3**
21	Users Functions	Calendar View of Events		EQ	10	3	Average	4		**4**
22	Drivers Functions	Notification New Near Spot Available		EQ	2	1	Low	3		**3**
23	Drivers Functions	Map/Search Available Spots		EO	7	4	High	7		**7**
24	Drivers Functions	Reserve Spot		EI	4	1	Low	3		**3**
25	Drivers Functions	Process Payment		EI	3	1	Low	3		**3**
26	Drivers Functions	Cancel Reservation Request		EI	1	1	Low	3		**3**
27	Drivers Functions	Receive Confirmation Email		EQ	2	1	Low	3		**3**
28	Drivers Functions	Access Resident Data		EQ	5	1	Low	3		**3**
29	Resident Functions	Insert New Parking Spot		EI	7	2	Average	4		**4**
30	Resident Functions	View Parking List		EQ	4	1	Low	3		**3**
31	Resident Functions	Add Availability Time Slots		EI	3	1	Low	3		**3**
32	Resident Functions	View Reservation Requests		EQ	13	4	High	6		**6**
33	Resident Functions	Accept/Reject Request		EI	1	1	Low	3		**3**

COCOMO II

- Early-Model
- Scale-Driver set to Nominal
- 140 UFP = 12 Months of work

Why have we been so fast?

- AI help
- Strong cohesion
- …

Results

Software Development (Elaboration and Construction) Staffing Profile

Effort = 41.9 Person-months
Schedule = 12.0 Months
Cost = $75412

Total Equivalent Size = 11200 SLOC
Effort Adjustment Factor (EAF) = 1.00

Acquisition Phase Distribution

Phase	Effort (Person-months)	Schedule (Months)	Average Staff	Cost (Dollars)
Inception	2.5	1.5	1.7	$4525
Elaboration	10.1	4.5	2.2	$18099
Construction	31.8	7.5	4.2	$57314
Transition	5.0	1.5	3.3	$9050

Software Effort Distribution for RUP/MBASE (Person-Months)

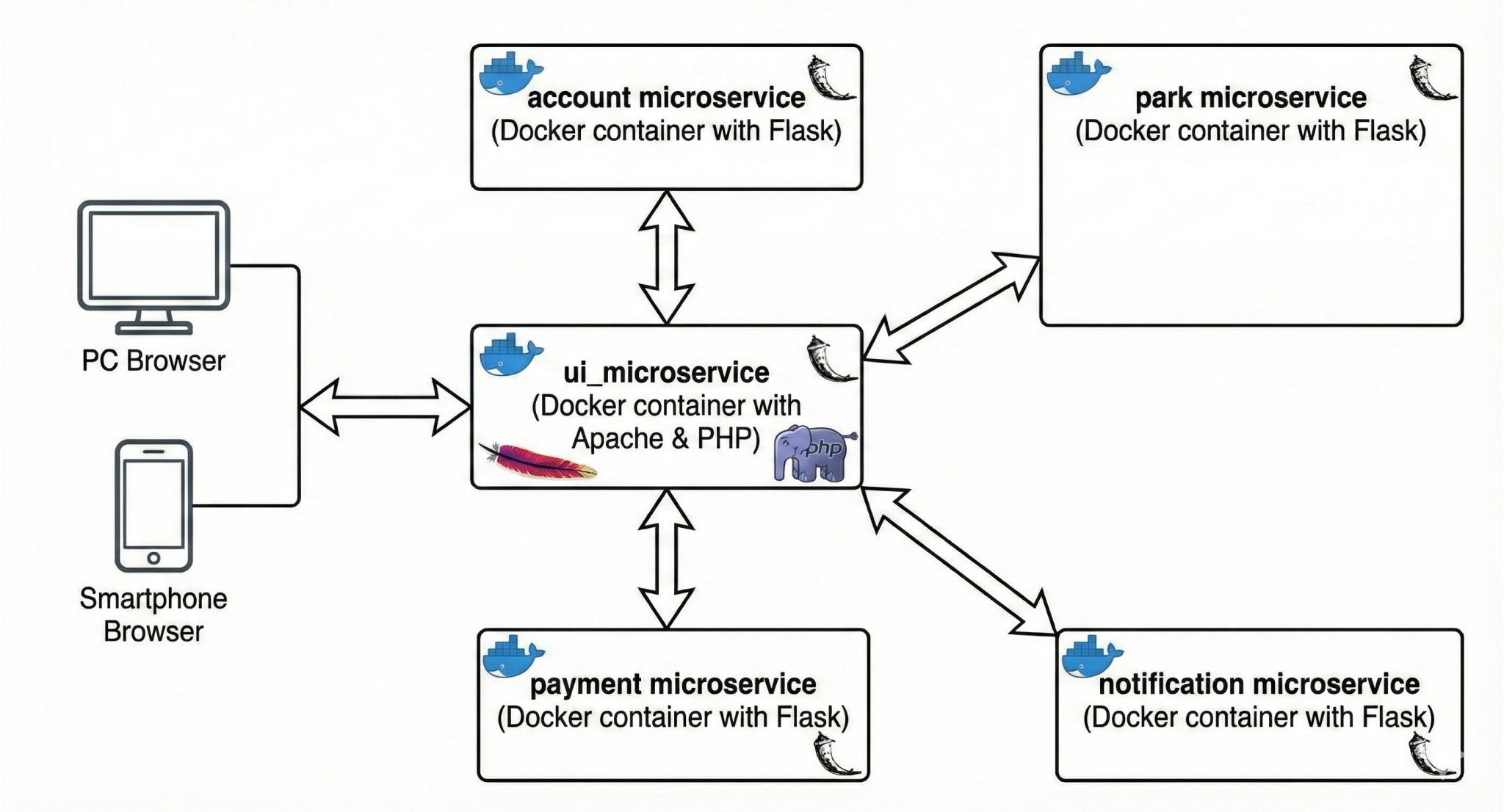
Phase/Activity	Inception	Elaboration	Construction	Transition
Management	0.4	1.2	3.2	0.7
Environment/ CM	0.3	0.8	1.6	0.3
Requirements	1.0	1.8	2.5	0.2
Design	0.5	3.6	5.1	0.2
Implementation	0.2	1.3	10.8	1.0
Assessment	0.2	1.0	7.6	1.2
Deployment	0.1	0.3	1.0	1.5

Your output file is at http://softwarecost.org/tools/COCOMO/data/COCOMO_December_4_2025_14_16_45_365284.txt

Created by Ray Madachy at the Naval Postgraduate School. For more information contact him at rjmadach@nps.edu.

Architecture

Diagram


account microservice
(Docker container with Flask)
park microservice
(Docker container with Flask)
PC Browser
ui_microservice
(Docker container with
Apache & PHP)
Smartphone
Browser
payment microservice
(Docker container with Flask)
notification microservice
(Docker container with Flask)