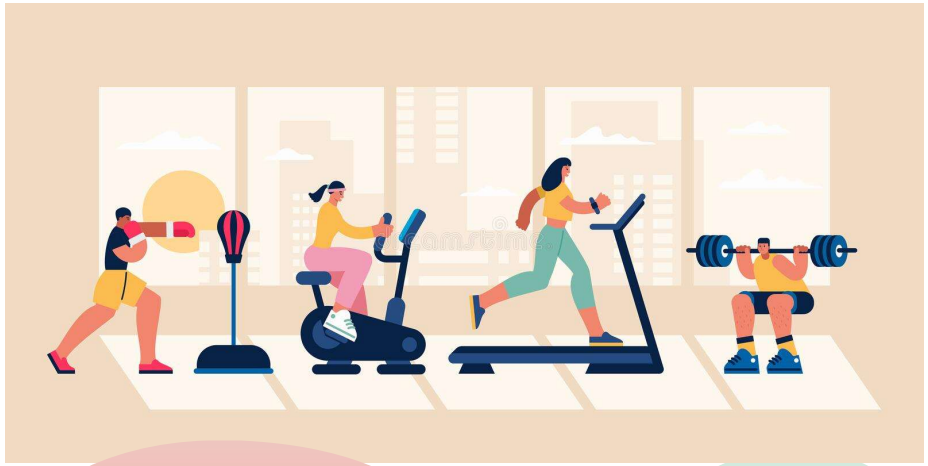
Advanced Gym Recommender (AGR)



Join now!

OUR TEAM

Meet the creator of AGR!

AGR's Developer

01. PROJECT INTRODUCTION

Project scope, background, motivation and goal

02. BACK-END SOLUTION

Recommendations logic and implementation

03. FRONT-END SOLUTION

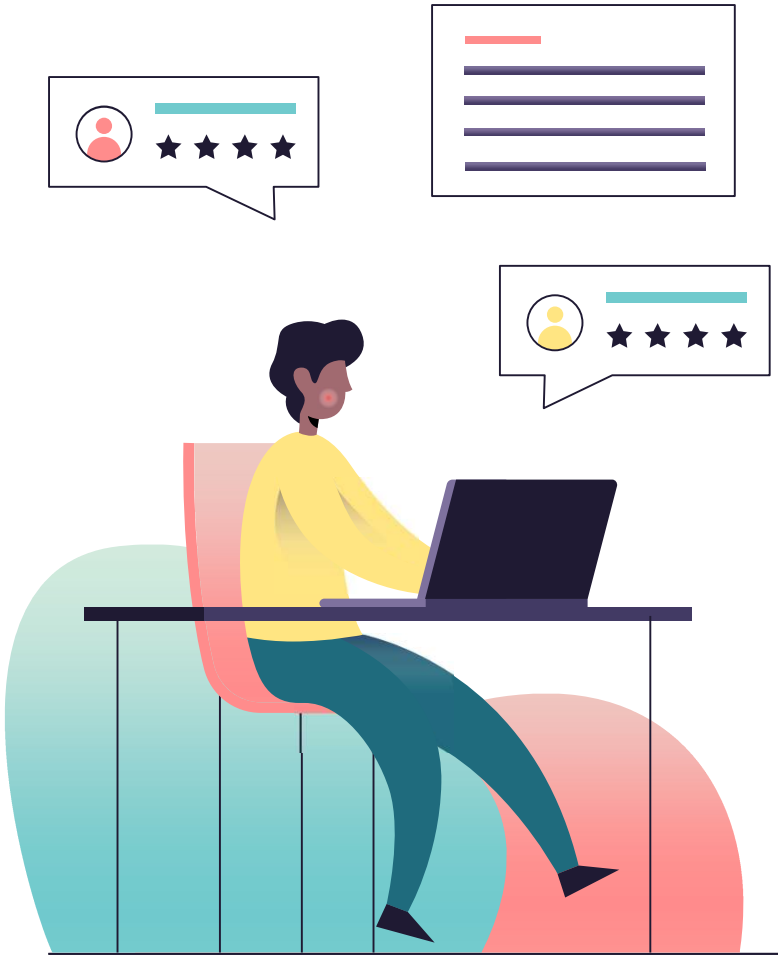
UI application design and back-end integration

04. SNEAK PEAK

Preview of the upcoming application in demand: AGR

05. CONCLUSION

Solution overview, limitation and future improvement



01

PROJECT INTRODUCTION

Market research, project scope and goal

Background & Project Objectives

Market overview

Global gym industry is worth US$96.7billion

Projected 230 million members by 2030, CAGR of 2.9%

Rise of 'Digital fitness'

Global fitness application valued at US$4.4 billion

Challenges in exercise personalisation

Inadequate knowledge for newcomers

Selected routines do not meet fitness goals/preferences

Lack of motivation & accountability

Project Objectives

01

Perform knowledge acquisition, discovery and representation

02

Design Recommender system to curate unique and relevant workouts

03

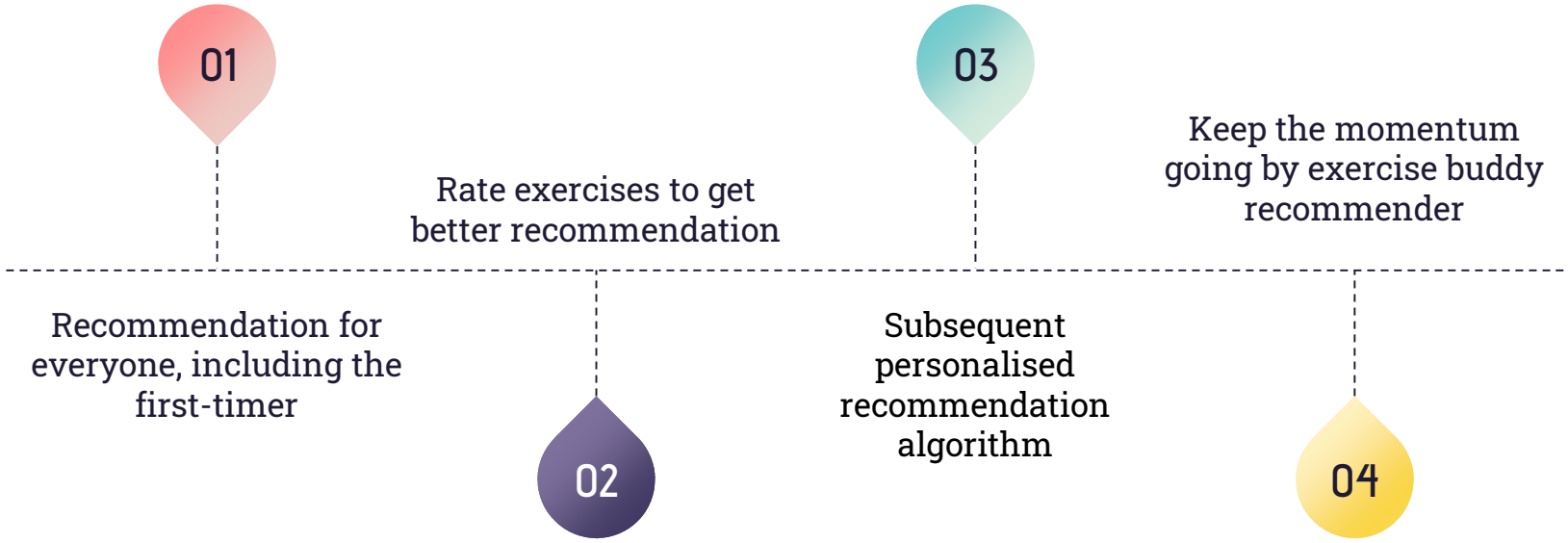
Provide User-user connections to improve retention

02

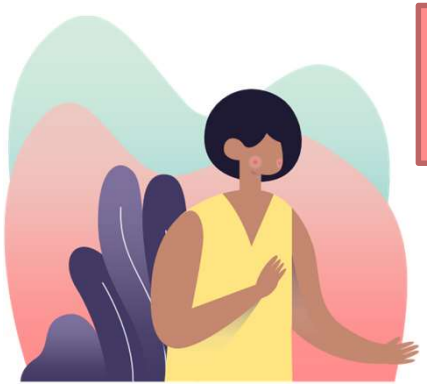
BACK-END SOLUTION

Recommendations logic and implementation

RECOMMENDATION STRATEGY



For the first timer



First time Fanny

I have never used this app before, how will it know what I like?

No worries! I just need some basic information from you and I can get your first recommendation ready

AGR

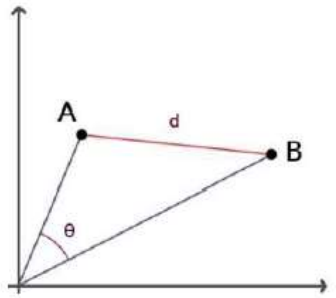
First recommendation needs to:

- Not cause too much hassle for the user
- Work with initially limited data on the user
- Provide a usable recommendation for user to rate afterwards to build up rating data for subsequent recommendations

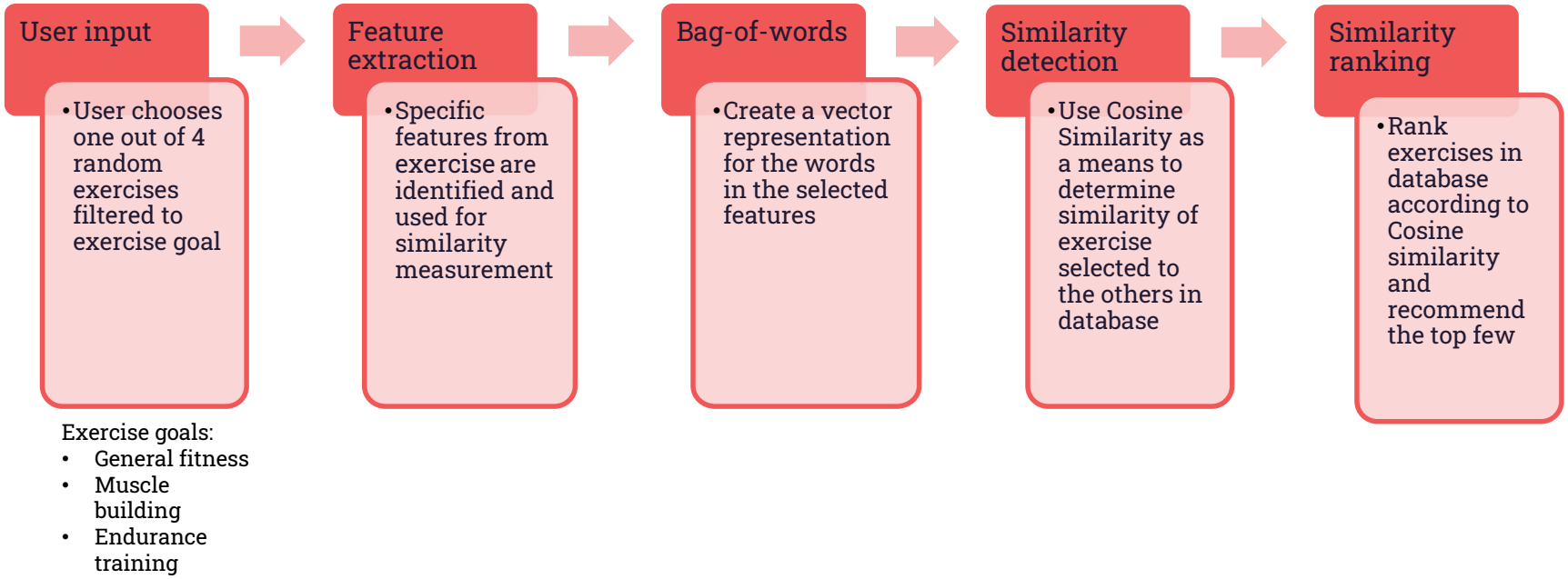
Content-based recommendation: Cosine Similarity

- Initial exercise selected by user serves as a proxy for representing his/her preferences (feature vector)
- Feature vector of selected exercise used as input to calculate cosine similarity with other exercises

$$similarity = \cos(\theta) = \frac{A.B}{||A||\,||B||} = \frac{\sum_{i=1}^{n} A_i \times B_i}{\sqrt{\sum_{i=1}^{n} (A_i)^2}\,\sqrt{\sum_{i=1}^{n} (B_i)^2}}$$



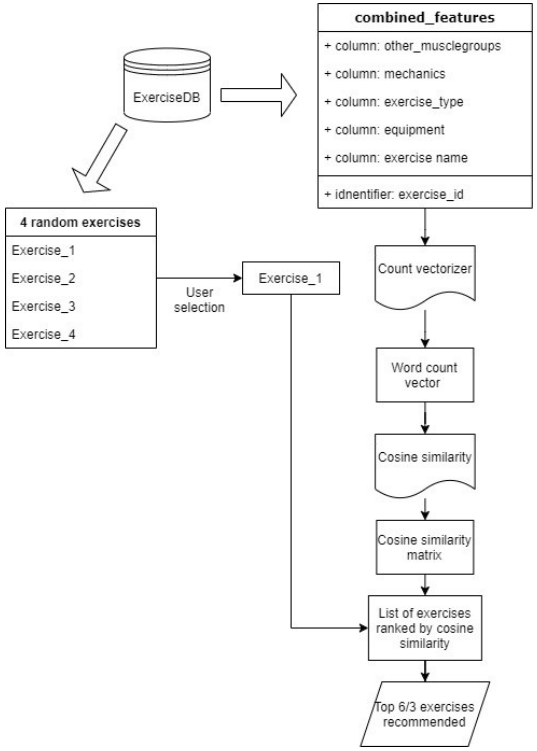
First pass recommendation flow



Exercise goals:

- General fitness
- Muscle building
- Endurance training

First pass recommendation schematic



Ratings for the first set of recommended exercises added to rating matrix

Subsequent exercise recommendations

Model based Collaborative Filtering (CF)

Exercise

User	W	X	Y	Z
A	4.0		3.0	
B		3.0		
C			4.0	5.0
D	2.0		3.0	

Rating Matrix

Latent feature extraction

A	1.3	0.6
B	0.3	1.8
C	0.5	0.9
D	1.9	0.5

User Matrix

X

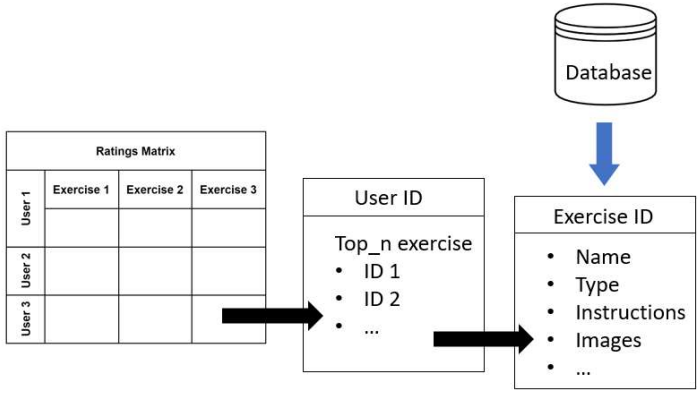
W	X	Y	Z
0.4	1.2	1.5	0.3
1.2	0.8	1.7	1.8

Exercise Matrix

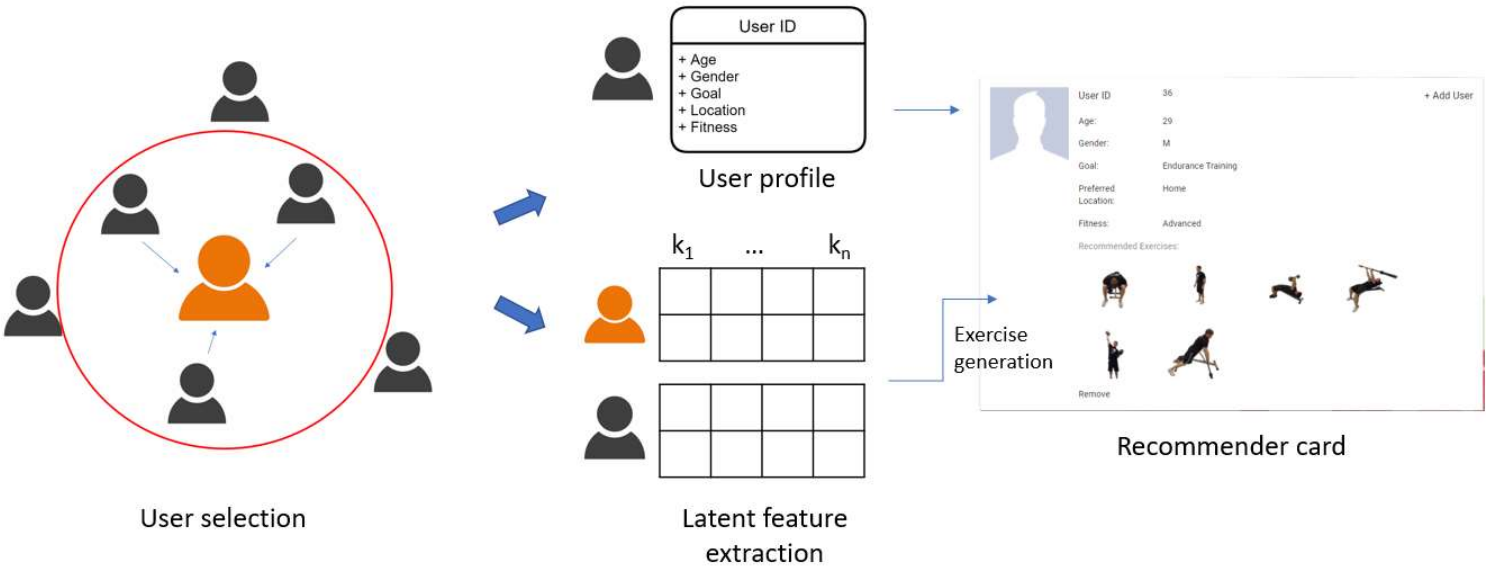
$$\hat{r}_{ui} = \mu + b_u + b_i + q_i^T p_u$$

Predicted score

Exercise set creation & display



Exercise buddy recommendation



Exercise group recommendation

Group Name	ISS Exercise Group
Group ID:	1
Group size:	5
Group limit:	10
Training days:	Tuesday, Friday
Goal:	General Fitness
Fitness:	Beginner

+ Join Group
+ Invite Trainer

Recommended Exercises:

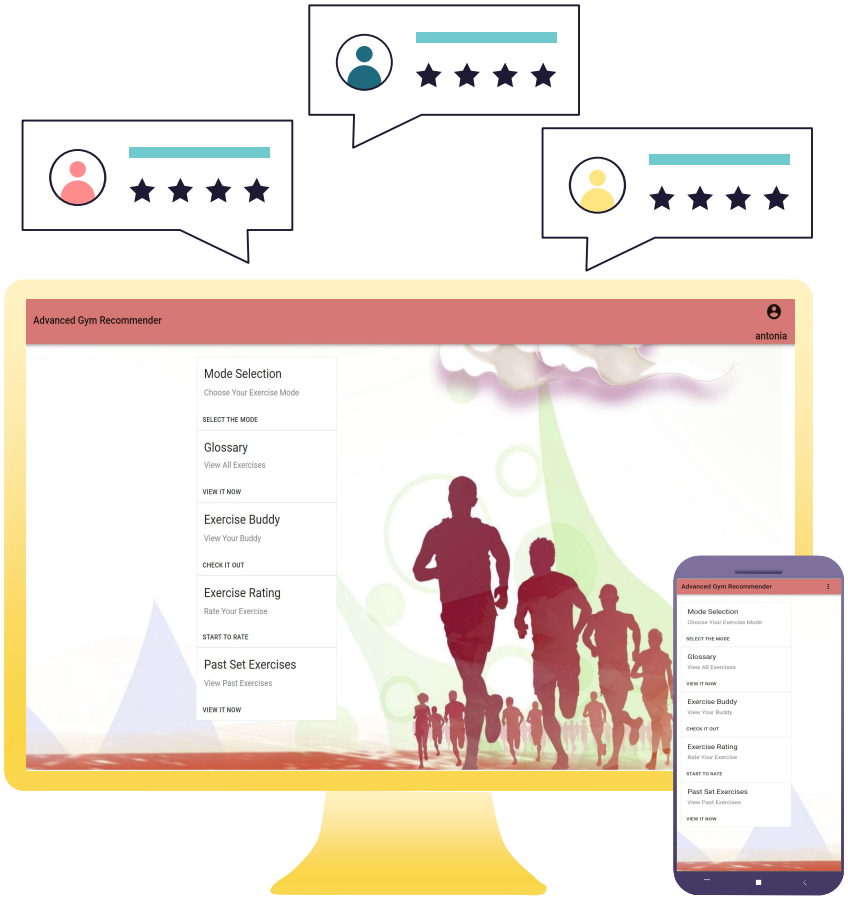
Remove

Group Name	NUS Gym Club
Group ID:	2
Group size:	8
Group limit:	15
Training days:	Monday, Wednesday, Friday, Sunday
Goal:	Muscle Building
Fitness:	Intermediate

+ Join Group
+ Invite Trainer

Recommended Exercises:

Remove

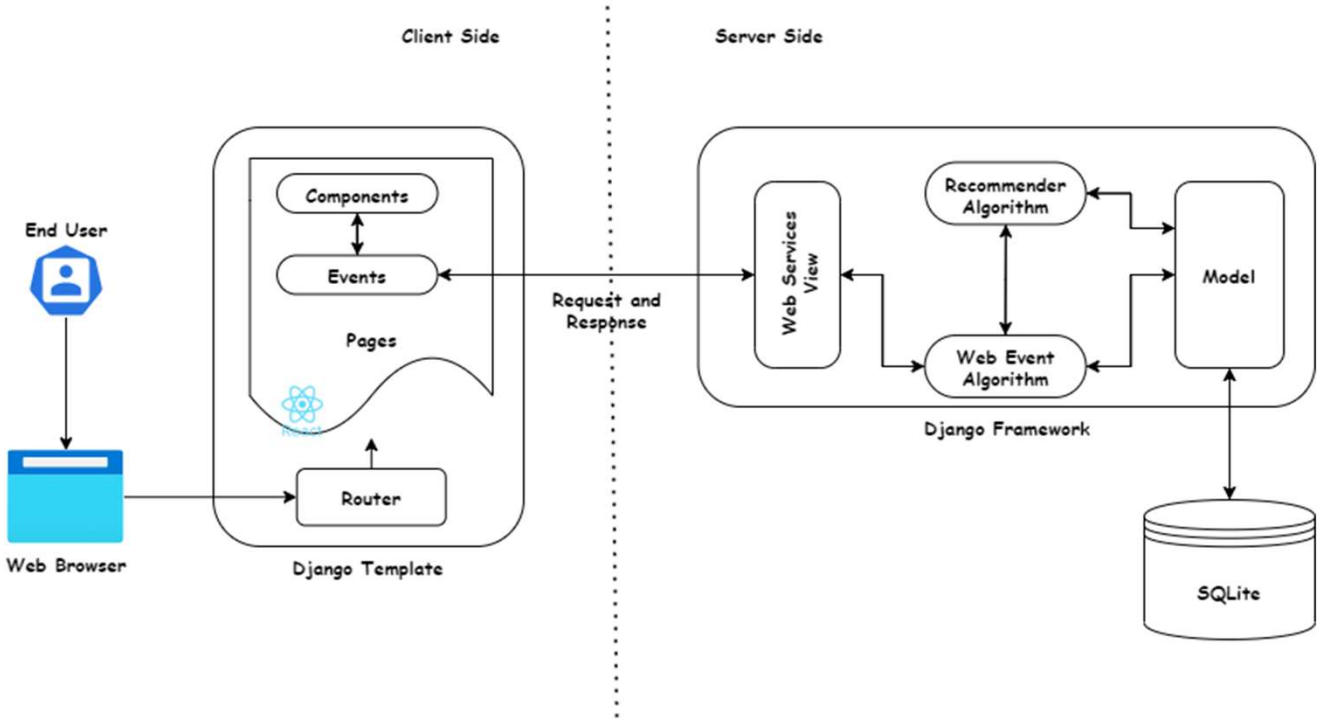


03

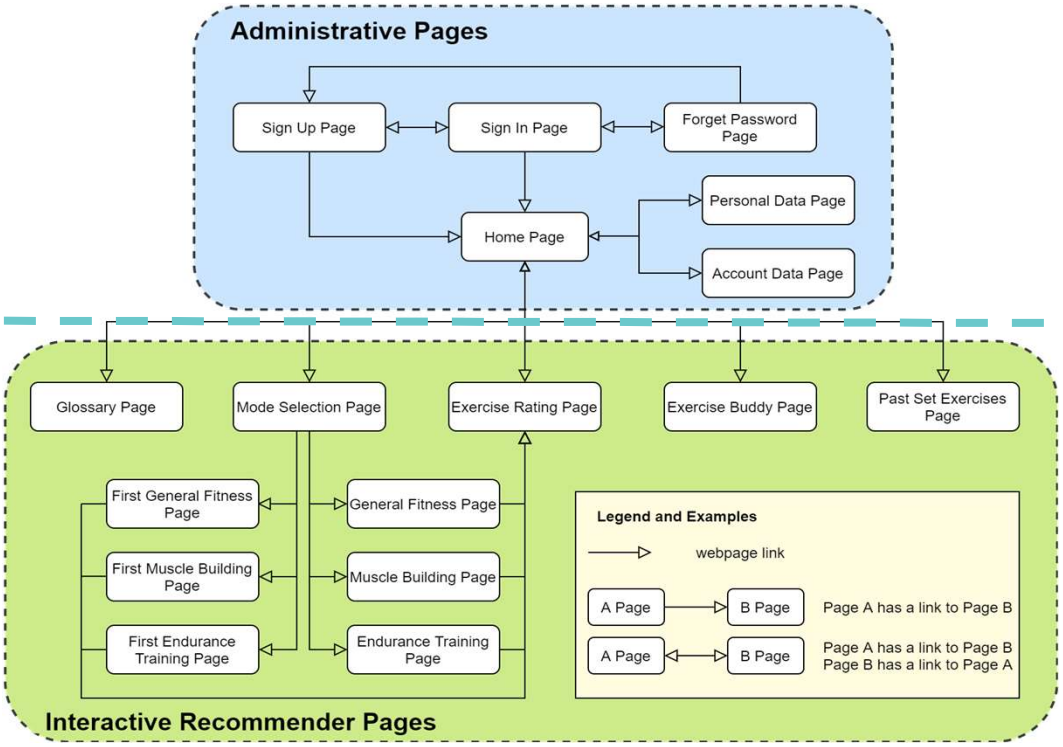
FRONT-END SOLUTION

UI application design and back-end integration

System Architechture



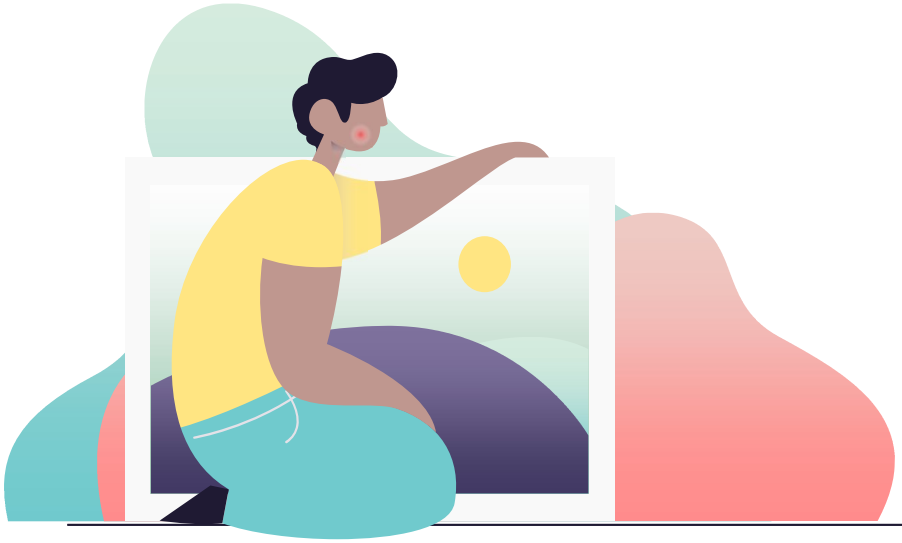
Front-end webpage connections schematics



User database creation and update

Back-end recommendation logic

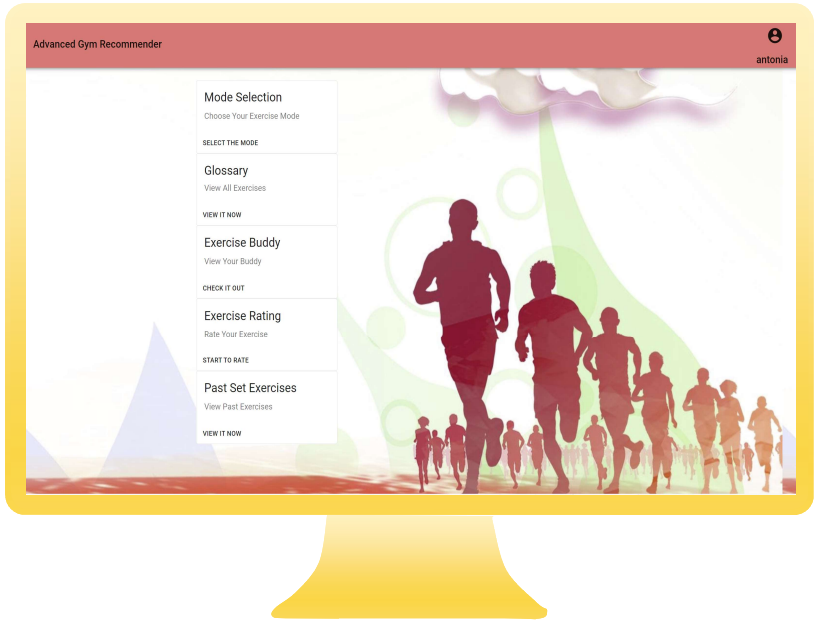
04

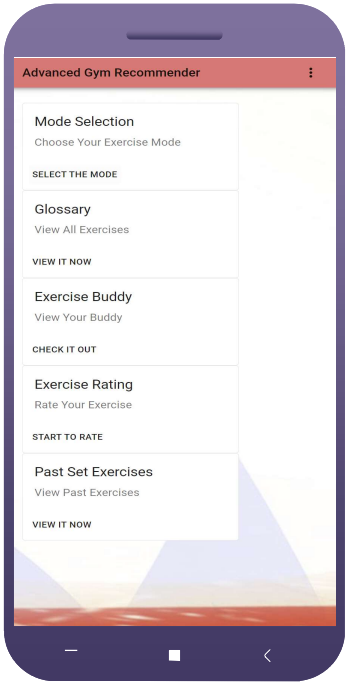


SNEAK PEAK

Preview of the upcoming application in demand: AGR

AGR – Home


Advanced Gym Recommender
antonia
Mode Selection
Choose Your Exercise Mode
SELECT THE MODE
Glossary
View All Exercises
VIEW IT NOW
Exercise Buddy
View Your Buddy
CHECK IT OUT
Exercise Rating
Rate Your Exercise
START TO RATE
Past Set Exercises
View Past Exercises
VIEW IT NOW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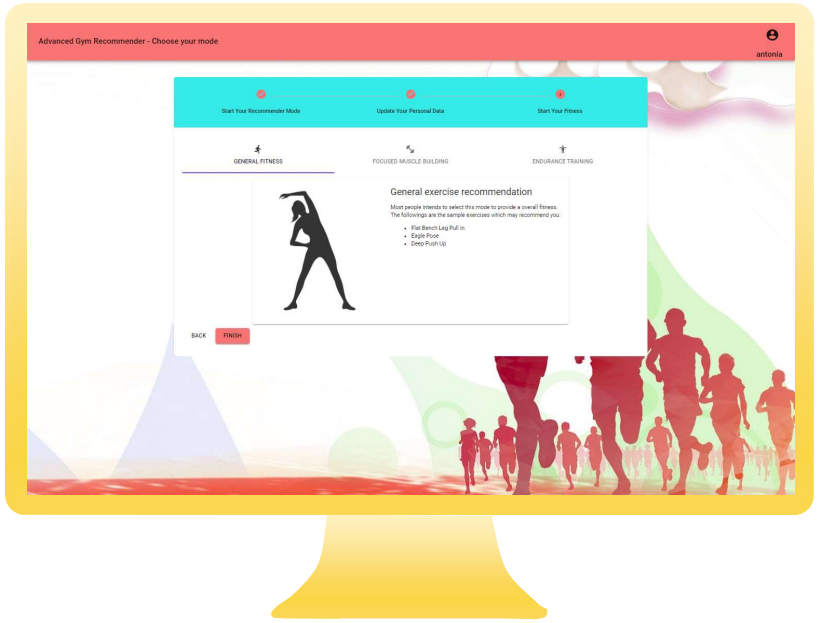
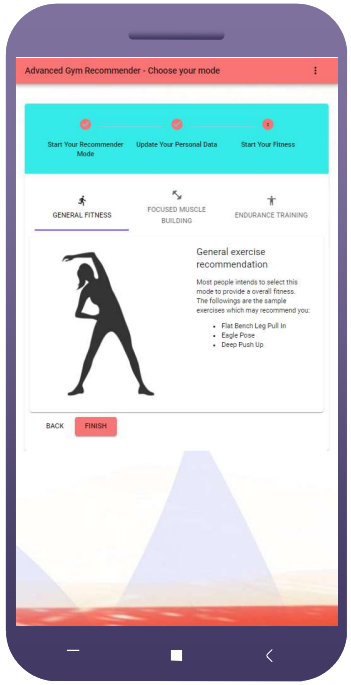
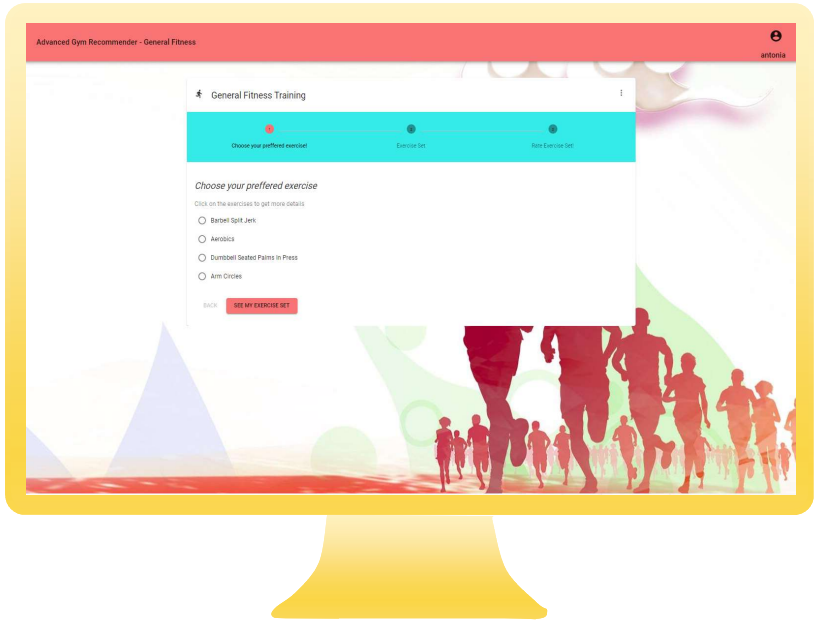
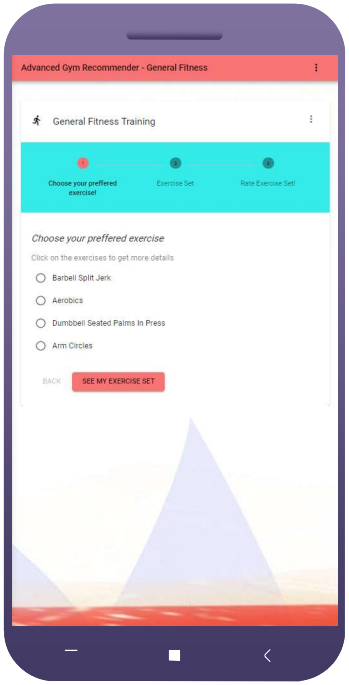
AGR – Mode Selection



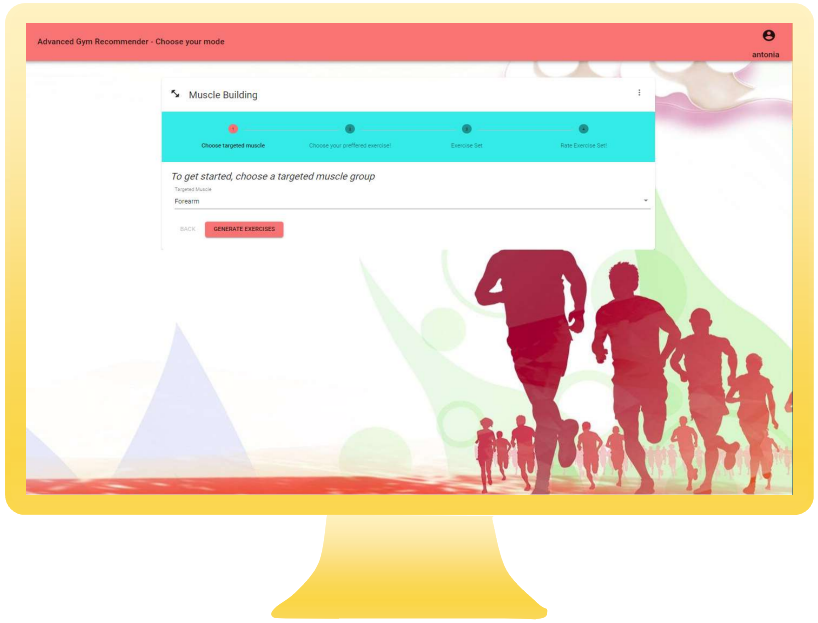


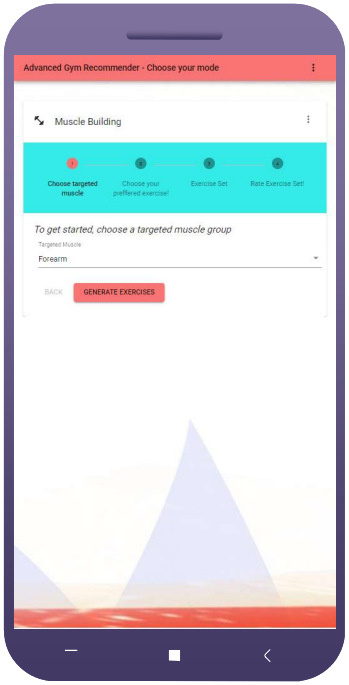
AGR – General Fitness



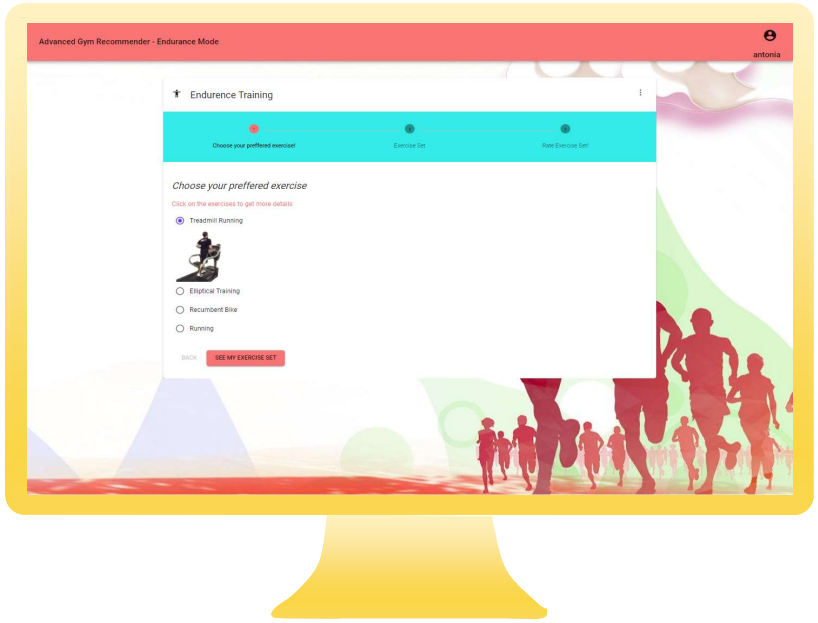


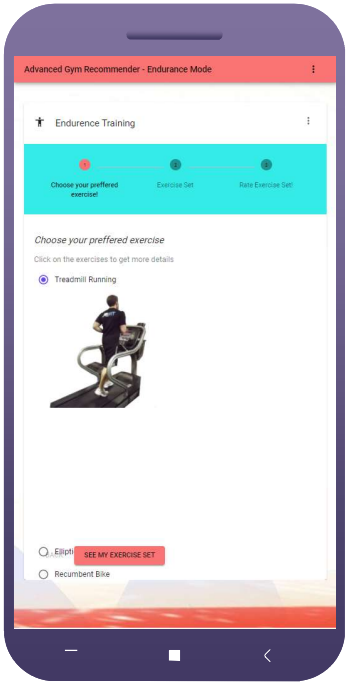
AGR - Muscle Building



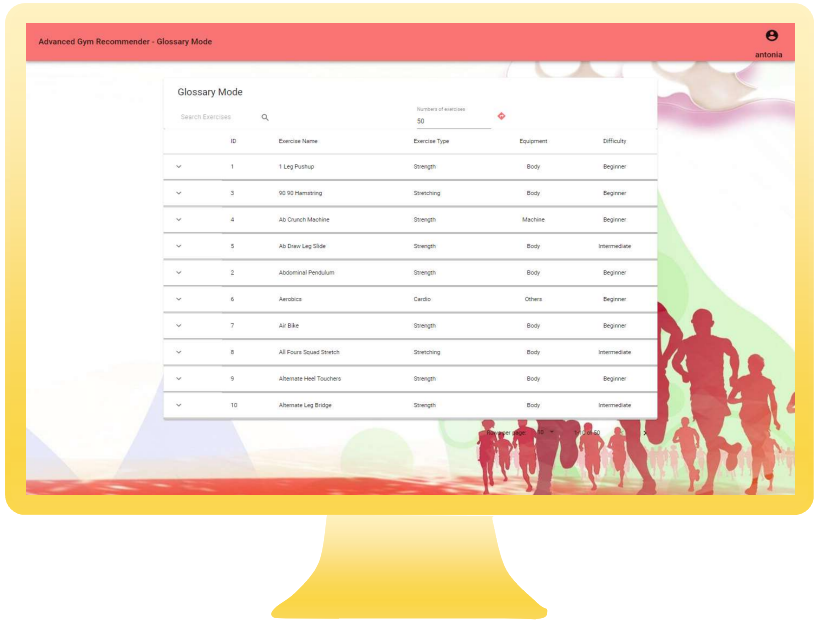


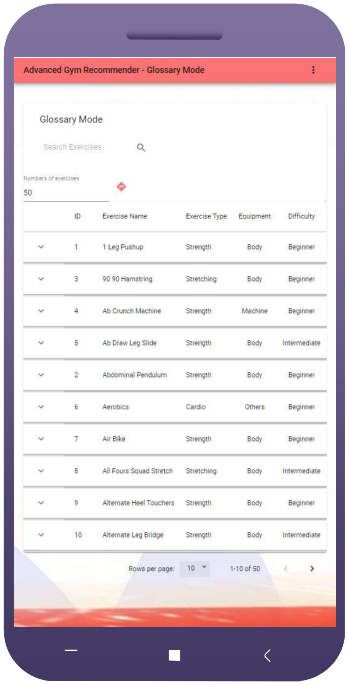
AGR - Endurence



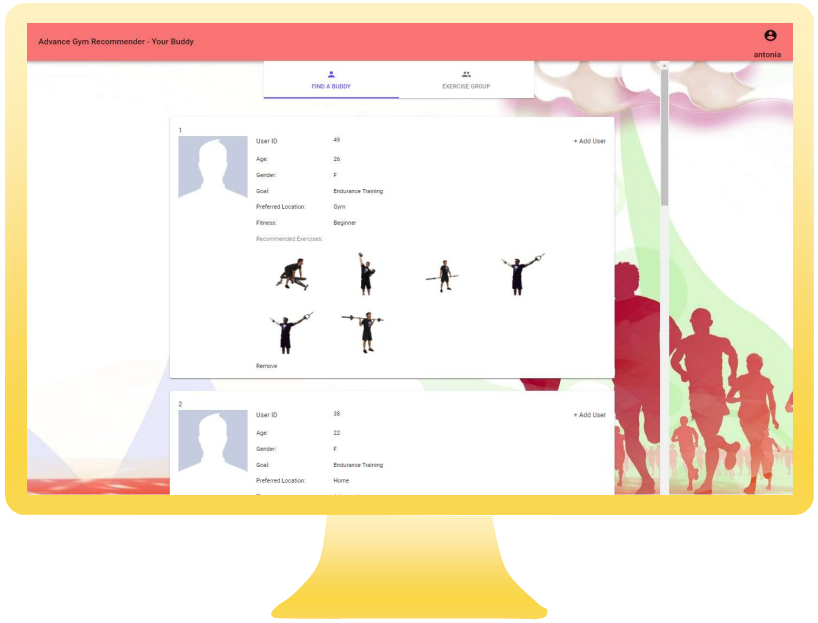


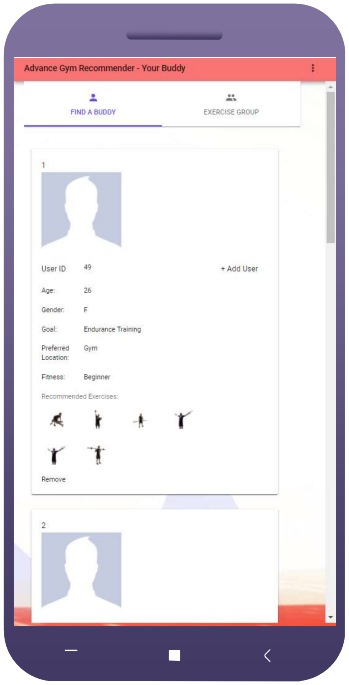
AGR - Glossary





AGR – Exercise Buddy





05

CONCLUSION

Project achievements & future improvments

Project achievements & future improvments

01

Extraction of domain knowledge and design of business rules, knowledge discovery of item features

02

Development of recommender system via model-based approach, with both exercise and user recommendations

03

Development of interactive frontend UI

04

Further improvements include using larger datasets of real user ratings and cloud implementations

THANKS!

Visit us at: https://github.com/chwa0001/IRSPM