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FACULTY OF ENGINEERING
& APPLIED SCIENCE

ENSE 405 Project report-out & lessons learned

Project name: FlexAvail

Project sponsor & course facilitator: Dr. Tim Maciag (ENSE 405 professor)



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BackGround/Business need/Opportunity

FlexAvail is an innovative mobile application poised to transform the fitness and wellness industry. In our fast-paced society, maintaining a healthy lifestyle can be a daunting task, especially with the pressures of daily life and the prevalence of unhealthy food choices. FlexAvail is designed to tackle these challenges by offering a comprehensive fitness solution that is tailored to each user's unique needs, schedules, and fitness objectives.

The fitness industry is a vibrant market, with an increasing recognition of the critical role physical fitness plays in overall health. Yet, many individuals, particularly those new to fitness, struggle to embark on an exercise regimen due to a lack of knowledge, guidance, and time. While personal training services can provide these, they can be costly and may not be within everyone's reach.

This is where FlexAvail steps in. Our goal is to bridge this gap by offering a user-friendly, adaptable, and affordable fitness solution. FlexAvail is more than just an app; it's a tool for those committed to enhancing their health and well-being.



Reflections on project planning

State and discuss the United Nation's (UN) Sustainable Development Goals (SDGs) selected and your "why" for selecting the one(s) you did

Our decision to focus on Sustainable Development Goal (SDG) 3, which emphasizes Good Health and Well-being, was not a coincidence but a deliberate choice. This goal resonates deeply with the core mission of our fitness application. Our app is not just a tool, but a commitment towards promoting health and well-being, making it intrinsically aligned with SDG 3.

We believe that everyone deserves access to resources that can guide them towards a healthier lifestyle. Our app aims to provide these resources in a personalized manner, acknowledging that each individual's journey to health and fitness is unique. In essence, our vision extends beyond the confines of a fitness application.

We aspire to contribute to a global community where good health and well-being are within everyone's reach. By providing accessible and personalized fitness resources, we hope to empower individuals to take charge of their health, thereby fostering a healthier and happier global community. This is how we, at FlexAvail, align with and contribute to SDG 3.

Discuss key findings from your community research and understanding/requirements gathering (Community characteristics and technology configuration inventory)

Community Characteristics:

- **Diverse User Base:** Our research revealed a diverse target audience with varying fitness levels, preferences, and goals.
- **Tech-Savvy Demographic:** The community showed a high level of tech-savviness, indicating a readiness to adopt and engage with digital fitness solutions.
- **Time Constraints:** Many users expressed time constraints as a barrier to regular exercise, seeking efficient and time-effective workout solutions.

Technology Configuration Inventory:

- **Device Preferences:** Users predominantly use smartphones, emphasizing the importance of a mobile-first approach in our app development.
- **Connectivity:** Reliable internet connectivity is crucial for seamless app functionality. Users expect features that can adapt to varying network conditions.
- **Integration with Wearables:** The community expressed interest in integrating the app with fitness wearables to enhance tracking accuracy and provide a comprehensive health overview.



Discuss your professional opinion of the processes and documentation used in this course for project planning. Did they help/hinder and how?

Creation of a Structured Roadmap: The course's comprehensive processes and documentation played a pivotal role in shaping a well-structured roadmap for our project. The incorporation of regular feedback loops(cohort) was instrumental in preserving agility and responsiveness throughout the project's lifecycle.

How it helped: One of the significant challenges we encountered was finding the right balance between flexibility and structure. While iterative planning provided the much-needed adaptability, it necessitated meticulous attention to prevent scope creep. This delicate balancing act was a learning experience, teaching us the importance of careful planning and adaptability in project management.

State selected north star & carryover customers. Why are these customers important to your project's golden circle (why, how, what)?

- North Star: The selected North Star for our project is to improve the overall health and well-being of individuals by providing accessible and personalized fitness solutions. Our goal is to empower users to adopt a healthier lifestyle through engaging and effective workouts.
- Carryover Customers: The carryover customers for our project include individuals who have actively participated in our beta testing phase and have provided valuable feedback. These customers are crucial to the project's golden circle because:
 - Why: They represent a user base that has already shown interest in our fitness app and believes in the value it provides. Their continued involvement ensures a dedicated user community.
 - How: These customers serve as advocates for our app, sharing their positive experiences with others. Their word-of-mouth promotion can significantly contribute to user acquisition.
 - What: By retaining these customers, we aim to build a loyal user base that consistently engages with our app, providing long-term sustainability and growth.

Summarize assumptions made and constraints uncovered, re: drafting an emerging picture

Assumptions:



- User Engagement: We assumed that users would actively engage with the fitness app, participating in workouts consistently. The assumption is based on the increasing trend of health and fitness consciousness.
- Technological Literacy: Users are assumed to have a basic level of technological literacy to navigate and utilize the features of the app. This assumption influences the app's user interface and onboarding process.
- Internet Connectivity: The app assumes that users have a stable internet connection for streaming workout videos and accessing real-time updates. Limited connectivity could impact the user experience.
- Device Compatibility: The app assumes compatibility with a range of devices, including smartphones and tablets. This assumption is based on the prevalence of mobile devices for fitness-related activities.

Constraints:

- Budget Constraints: The project operates within predefined budget constraints, affecting choices in terms of technology stack, marketing strategies, and overall development scope.
- Time Constraints: The project has time constraints aligned with the course duration. These constraints influence the depth of features, requiring prioritization based on importance and feasibility.
- Resource Limitations: Limited resources, including the size of the development team, impact the speed and scale of feature implementation. This constraint is mitigated by efficient task allocation and collaboration.
- Technical Dependencies: The project is dependent on the availability and compatibility of third-party services and APIs. Any changes or disruptions in these services could impact the app's functionality.

Discuss initial & the evolution of your technology stack selection, drafted prototypes, and initial Minimum Viable Products (MVPs)

Initial Technology Stack Selection: The initial technology stack was chosen based on considerations of efficiency, scalability, and familiarity.

The stack included:

- Frontend: React Native - Chosen for its cross-platform compatibility, allowing the app to run seamlessly on both iOS and Android devices with a single codebase.
- Backend: Node.js with Express - A lightweight and fast backend framework suitable for handling the expected traffic of the fitness app.
- Database: MongoDB - A NoSQL database chosen for its flexibility and scalability, accommodating potential future data growth.

Drafted Prototypes: The early prototypes focused on wireframes and low-fidelity designs, emphasizing user interface and user experience.

The key features included:

- User Onboarding: An intuitive onboarding process introducing users to the app's features and functionalities.



- Workout Library: A categorized library of workouts with brief descriptions, durations, and difficulty levels.
- Video Streaming: Integration of a video streaming feature for workout sessions, ensuring a dynamic and engaging user experience.
- User Profile: A user profile section for tracking workout history, achievements, and personal preferences.

Initial Minimum Viable Product (MVP):

The initial MVP focused on delivering a core set of features to validate the app's concept and functionality:

- User Registration and Authentication: Users could create accounts, log in, and maintain personalized profiles.
- Workout Library: A basic library showcasing a variety of workouts with static details.
- Video Streaming: Users could stream pre-recorded workout videos for selected routines.
- Basic Tracking: Minimal tracking of workout duration and calories burned.

The evolutions were driven by feedback from initial user feedback, technological considerations for enhanced performance, and a commitment to delivering a more robust and engaging fitness experience. The technology stack and MVP were continually refined to align with emerging industry standards and user expectations.

Reflections on project results

Discuss what you created. Provide key images/screenshots illustrating core functionality

The fitness app, named "FlexAvail," was developed to provide users with a comprehensive and customizable workout experience. Key functionalities were implemented to enhance user engagement and promote a healthy lifestyle. Here is an overview of the core features:



- Workout Library: Curated an extensive library of workouts spanning various categories such as cardio, strength training, and yoga. Each workout in the library included detailed descriptions, durations, and

Recommended Workouts

High-Intensity Interval Training (HIIT)

30 Minutes

Full Body Strength Training

45 Minutes

Yoga Flow

60 Minutes

Circuit Training

40 Minutes

Running Intervals

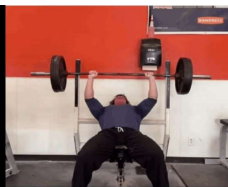
20 Minutes

Home

Profile

amount of kcal burned.

- Video Streaming: Integrated video streaming functionality to enable users to follow workout routines through high-quality instructional videos. Utilized Cloudinary for efficient storage and retrieval of workout-related images and videos.



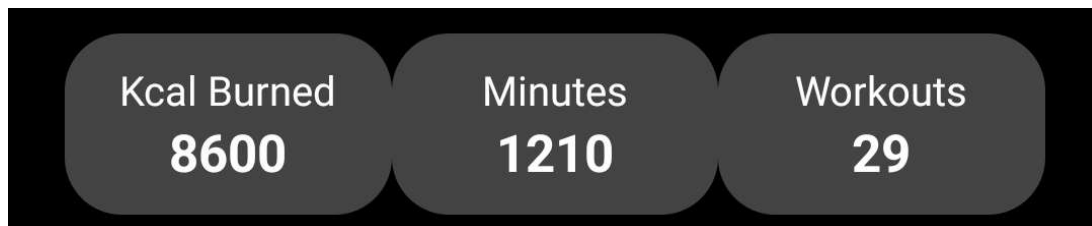
Complete Workout



- User Profile: Developed a user profile section to track individual workout history, achievements, and preferences. Users could set personal fitness goals and track their progress over time.

The image shows a mobile app interface for a user profile. At the top, there is a circular profile picture placeholder with a silhouette of a person. Below the picture is the word "Profile" in bold. To the right of "Profile" is a small "Edit" button. Below this, there are several input fields for user information: "Age" with the value "21", "Weight" with "92 kg", "Height" with "178 cm", "Gender" with "male", "Goal" with "Lose Weight", and "Equipment" with "Home". At the bottom of the form is a "Logout" button. Below the form are two navigation buttons: "Home" and "Profile".

- Real-time Tracking: Implemented real-time tracking of workout duration and calories burned during exercise sessions. Enhanced tracking features allowed users to monitor their performance and make data-driven decisions.



The initial planning and initialization video outlined the app's vision, key features, and the intended user experience. The developed solution closely aligns with the envisioned product, however, we weren't able to implement a complete system for recommending workouts.



Summarize software design activities and findings. Ensure you discuss how you/your team either linked or envision links to design ideas back to topics discussed in class lectures

The software design process involved translating conceptual ideas into a functional and user-friendly application. Key design activities included:

- **User-Centered Design:** Applying principles discussed in class lectures, the app prioritized user needs, preferences, and feedback. User personas and empathy maps guided the design process.
- **Progressive Learning Approach:** The app incorporated a progressive learning approach, providing users with personalized and adaptive workout recommendations based on their fitness levels and goals.
- **Gamification Elements:** Gamification elements, inspired by class discussions, were integrated to enhance user motivation. Achievements and badges were introduced to make the fitness journey more engaging.



- **Digital Habitat and COP (Community of Practice):** The app fostered a sense of community by allowing users to share achievements, participate in challenges, and connect with like-minded individuals pursuing similar fitness goals.
- **Accessibility Considerations:** Design considerations included accessibility features to ensure the app caters to a diverse user base, aligning with discussions on inclusive design practices.

Summarize how you felt about this project (likes/dislikes), from your experiences with the technology stack selected, translating prototypes into real solutions, and the creation/realization of your MVPs

Likes/Dislikes:

- **Likes:** The project provided a valuable opportunity to apply theoretical knowledge to practical implementation. Working with React Native and integrating features like video streaming and real-time tracking was both challenging and rewarding.
- **Dislikes:** Challenges arose during the integration of third-party APIs and managing asynchronous operations in React Native. Debugging and resolving compatibility issues were time-consuming. Additionally, creating recommendations to users presented complexities.

What Went Well:

- **User-Centered Design:** Prioritizing user needs and preferences guided the project, resulting in a user-friendly app.
- **Technology Stack:** The chosen technology stack, including React Native and Node.js, facilitated efficient development and deployment.
- **Adaptability:** The project team demonstrated adaptability by incorporating user feedback and iteratively improving the app.

Not What Went Well:



- Third-Party Integration: Challenges were faced during the integration of external APIs, leading to delays and additional debugging.
- Asynchronous Operations: Managing asynchronous operations in React Native introduced complexities in certain functionalities.
- Time management: There was not enough time to complete certain features.

What Would Be Done the Same:

- User-Centric Approach: Prioritizing user needs and feedback would remain a central aspect of future projects.
- Agile Methodology: The iterative and agile development approach proved effective in responding to evolving requirements.

What Would Be Done Differently:

- Thorough API Evaluation: In future projects, a more thorough evaluation of third-party APIs would be conducted to anticipate integration challenges.
- Device Testing Strategy: A more robust strategy for cross-device testing, considering various screen sizes and resolutions, would be implemented.

Opportunities and Design Ideas for Future Work:

- Enhanced Gamification: Future iterations could deepen gamification elements, introducing virtual challenges, social leaderboards, and in-app communities.
- Personalized AI Recommendations: Implementing AI-driven recommendations for workouts based on user preferences, performance, and goals could elevate the user experience.
- Integration of Wearable Devices: Exploring integration with wearable fitness devices to capture real-time biometric data for more accurate tracking.
- Continuous Feedback Loop: Establishing a continuous feedback loop with users through surveys, beta testing, and analytics to drive ongoing improvements.

General reflections on the class & project experience

Before taking ENSE 405, were you aware of the UN SDGs?

No, I was not aware of the UN Sustainable Development Goals (SDGs) before taking ENSE 405. The course introduced me to these goals and their importance in the context of technology and software.



Typically, before taking this class, when you engineered software solutions, were you concerned with areas encompassing the UN SDGs?

Before taking this class, my primary focus in engineering software solutions was on functionality, efficiency, and user experience. While I was aware of broader societal impacts of technology, I did not explicitly consider the UN SDGs in my engineering work.

However, upon reflection, there have been instances where software solutions I (co)created could potentially contribute to addressing some of the UN SDGs. For example, if a project involved developing educational software or platforms promoting health and well-being, it could indirectly align with SDG 4 (Quality Education) or SDG 3 (Good Health and Well-being). Still, these considerations were not at the forefront of my engineering decisions.

Did learning about the UN SDG(s) help you understand better your role and responsibility as an engineer to society?

Yes, learning about the UN SDGs has helped me better understand my role and responsibility as an engineer to society. It provided a broader perspective on the potential impact and implications of technology on global challenges. The SDGs serve as a valuable framework for aligning engineering efforts with broader societal needs and goals. It has influenced me to consider the ethical and social implications of technology in my engineering practice, encouraging a more responsible and purpose-driven approach.

As a future engineer, what are your thoughts on the UN SDGs as a whole? Do you think they can help or hinder our work as software engineers?

The UN Sustainable Development Goals (SDGs) serve as a transformative framework, guiding engineering efforts toward creating positive impacts on a global scale. As a future software engineer, I see the SDGs as a beacon for purpose-driven work, instilling a sense of responsibility to contribute meaningfully to societal and environmental challenges. The goals provide a holistic perspective, emphasizing the interconnectedness of issues and encouraging innovative, ethical, and context-specific solutions. While challenges such as complexity, local adaptation, and ethical considerations exist, the SDGs offer a compelling roadmap for engineers to align their skills and expertise with the broader goals of sustainability and social equity.



Should we use the UN SDGs to guide our work or is our work dependent on customer requests, regardless of the UN SDGs?

The incorporation of the UN Sustainable Development Goals (SDGs) into our work should be viewed as a valuable and ethical guiding framework. While customer requests and business objectives play a crucial role in shaping software engineering projects, aligning our work with the SDGs can contribute to more sustainable, socially responsible, and impactful solutions. Striking a balance between customer demands and the broader societal context encapsulated by the SDGs is essential. It allows engineers to deliver products and services that not only meet immediate needs but also contribute to addressing larger global challenges. Ultimately, combining customer-driven approaches with a commitment to the SDGs can lead to more purposeful and conscientious engineering practices.

Will you use your understanding of the UN SDGs in engineering solutions in the future?

Yes, I will definitely use my understanding of the UN SDGs in engineering solutions in the future. The SDGs provide a comprehensive and globally recognized framework for addressing critical societal and environmental challenges. By incorporating these goals into my engineering practices, I can contribute to creating solutions that have a positive impact on the world. The SDGs offer a holistic perspective, encouraging engineers to consider not only the technical aspects of a project but also its broader implications for sustainability, social equity, and environmental responsibility. Embracing the UN SDGs aligns engineering efforts with a larger purpose, fostering a sense of social responsibility and ethical decision-making in the pursuit of innovative solutions.

Will your experience learning about the UN SDGs inform your career path decisions in the future?

Yes, my experience learning about the UN SDGs will inform my career path decisions in the future. Understanding the interconnectedness of global challenges and the role that technology and engineering play in addressing them has broadened my perspective. The UN SDGs provide a roadmap for creating meaningful and impactful solutions that go beyond traditional engineering considerations.

Informed by this knowledge, I am more likely to seek out opportunities and projects that align with the SDGs. It has influenced my belief in the importance of using technology to contribute positively to society, whether through environmental sustainability, social equality, or economic development. This awareness will guide my



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decisions in choosing projects, employers, and industries that prioritize values aligned with the UN SDGs, contributing to a more sustainable and responsible engineering career.