RollTech

Meeting Minutes

June 7, 2023
4:10 - 4:30pm
ASB 10703

Present: Amrit Mangat, Kaj Grant-Mathiasen, Kate Wang, Colin Buchko, Divyam Sharma, Mike Hegedus, Yalda Foroutan

Purpose of Meeting: To discuss project background, market, current progress, requirements, and risks (Progress Review #1)

Topics For Discussion:

- Introduction and Background of selected project [2 min]
- Market Outline (Target, size, required expertise, etc.) [1 min]
- Current design progress including research and ideation [2 min]
- Key Requirements and any associated risks including potential solutions [3 min]
- Question Period [7 min]

Minutes:

Mike Hegedus called the meeting to order at 4:27, late due to other meetings. Amrit agreed to record the minutes.

No prior meeting minutes to amend, and no prior business.

The meeting commenced with a 7.5 minute presentation on RollTech's current progress:

- **Introduction and Background**
    - The members of RollTech all introduced themselves.
    - Amrit provided a brief introduction to the project.
        - **Goal**: Create an attachment for office chairs that includes a battery-powered wheel system, a footstand, and a user-control system
        - A unique omni-wheel design was also mentioned
        - **Purpose:** He also stated it was a fun project, but mentioned further applications for people with limited mobility in the office environment.

- **Market Outline**
    - Amrit provided the market overview
    - **Target audience**: anyone wanting to add fun to the office and sitting at the desk.
    - **Specific market**: was stated as 15-65 age range, for individuals who spend a lot of time in the office setting.
    - **Expanded market:** for limited mobility, was mentioned with a size of 288,000.
    - Customer expertise required was stated as low due to the easy attachment and control process.

- **Design Progress (Research and Ideation included)**
    - Kaj provided the company's progress, and stated that the
        - Main design included using an omnidirectional ball, a main driving motor, and rotational motor.
        - He also stated that their research shows that 12-24v 240W DC motors were sufficient for their needs.
        - He then mentioned their current issues which included:
            - condensing machinery to fit under chairs
            - determining materials for optimum movement
            - designing a sufficiently strong support system to support enough weight for required friction
    - Colin then went over the drawings for the design,
        - Explaining the use of the driving and rotational motor to achieve the omnidirectional movement of the wheel
        - A backup/simpler plan was also explained which consisted of a basic wheel with motor and a rotating motor.

- **Key Requirements with Risks/Solutions**
    - Divyam stated the requirements for the project.
        - He mentioned that the main requirement was to motorize an office chair at low speeds to carry at least 300 pounds (including the chair).
        - The system also needed to be modular, to allow easy attachment and detachment, with a user-friendly control system
        - They also planned to have a mechanically extending leg rest that was stable enough to support leg weight, and to have the battery rechargeable by a simple power outlet
    - Kate then provided the risks,
        - Possibility of insufficient battery life, for which they will try to get a large enough battery or make charging easy.
        - The second risk mentioned was for damage to the system due to impact with obstacles, for which they mentioned that the modular nature would make replacing parts easy if there was damage.
        - The third risk was the possibility of the cables getting tangled as they rotated, and their possible solution was using a software mechanism to track and untangle the wires if needed.

        - The fourth risk was user control failure, and the suggested solution was to stop movement of the chair.
        - The final risk was for motor failure, and the modularity was again stated to allow for easy part replacement.
        - Lastly, suggestions were suggested to fix all of these problems

A question period followed the presentation

1. Mike stated that that introduction was good, but that the company should add context
    - He asked for context of the project idea, to which Colin replied that he had received the concept from his dad
    - His dad said he would like a work chair that he could drive around to pick things up instead of needing to get up repeatedly

Action: Colin to add context using the conversation with his dad to the project introduction and other documents by June 12th.

2. Mike questioned how the wheel/ball would operate on different materials, such as carpets as floors
    - Colin mentioned that the material of the ball would be tested to ensure it works on typical/basic flooring materials, but it may not work on materials that normal office chairs would also struggle on such as shaggy carpets

Action: RollTech to research material types for wheels that would offer highest traction on the majority of floors by June 30th.

3. Mike asked if the group was planning to buy an omni wheel similar to the image shown in the presentation, or make the entire system including the wheel.
    - He also mentioned that he had only seen one omni wheel design, which was quite different from the proposed idea.
    - Colin mentioned that Shervin had given them that idea.
    - Mike stated that a simpler solution may be better for our application, but that it is a good project to pursue to which Kaj added that they do have some simpler solutions in mind if this doesn't work as intended.

Action: RollTech to explore alternative options aside from the omni wheel as a backup plan should the product implementation prove more challenging than expected. Alternative implementation with high level technical details should be developed by June 30th.

4. Mike mentioned that the requirements presented were very technical, and that they should think of it from the user's perspective.
    - He gave the battery as an example, saying that the battery is a design option but the user's requirements can be phrased as should be rechargeable and last throughout the day.

- Requirements should also provide more details on what the user expects from the control system, with the joystick again being a design decision and requirement being controllable by hand, for example.
- Mike also gave another idea for a requirement, which could be that the wheels shouldn't mark floors and not lose traction.
- Overall, Mike recommended that technical wording should not bleed into requirements and that the language needed to be improved.

Action: RollTech to rephrase requirements from the user's perspective instead of using technical language by June 12th.

5. Mike said that he liked the suggestions and thoroughness with the risks, but also added that risks with project planning should also be considered.
    - Examples can be worries with meeting deadlines, finishing prototype, and backup options if parts of the project don't work.

Action: RollTech to add risks associated with project planning to documents by June 12th.

No other business.

Next meeting date was set as July 7th, 2023 with time to be decided.

Meeting was adjourned at 4:46 by Mike Hegedus.