Lab 1 – Team Yellow

Collaborative Outline

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1. Introduction
   1. Societal Problem
      1. Professional movers are expensive.
      2. DIY Movers inexperienced with move logistics
         1. Cost estimation
         2. Keeping track of everything
         3. Efficient space usage
         4. Packing
      3. Truck Loading takes careful consideration
      4. There are so many unknowns!
   2. Market Analysis
      1. Most people already DIY move
      2. Pro movers vs. DIY cost assessment
      3. Size of moving industry
   3. Introduction to Load.In
      1. Hi were load.in
      2. Computer Vision & AI
      3. Combine cost of DIY moving with expertise of Pro movers
   4. Solution Characteristics
      1. Load Plan Generation
      2. Keep track of box throughout move
      3. Tips and tricks
      4. Cost/time optimization
2. Product Description  
   Summary  
   Goals and Objectives
   1. Key Product Features and Capabilities
      1. Load Plan
         1. Measure your furniture
         2. 3D Model Generation
         3. Detailed instructions on how to load the truck
      2. Move Inventory
         1. Catalogue of all stored items and their location
      3. Rental Estimation
         1. Estimated total number of trips
         2. Estimated time to move
         3. Estimated rental truck costs per truck
      4. Expert Tips
         1. Display tips and suggestions for packing
         2. Search for tips
         3. Move experts write articles for help
      5. Chatbot and Live Help
         1. Help user interact though automation with AI that searches through tips
         2. Fallback to live move expert
      6. Vendor Synchronization
         1. Pulls in the data from the 3rd party rental companies
         2. Web scraper
         3. Web API Reader
      7. Move Analytics
         1. Location data
            1. Start location
            2. End location
            3. Total amount of trips
            4. Distance Traveled
         2. Move data
            1. Gas Cost
            2. Rental cost
            3. Supply cost
         3. Feedback Data
            1. Ratings per move
         4. User Inventory
            1. Weight of items
            2. Fragility of items
            3. Measurements of items
            4. Box Dimensions
   2. Major Components (Hardware/Software)
      1. Database
         * 1. AWS
           2. RDS
           3. MySQL
      2. Smartphone Client
         1. Hardware Overview
            1. Storage
            2. CPU
            3. Memory
            4. Wi-Fi Connectivity
            5. Bandwidth
            6. Cellular
            7. Camera
         2. OS Overview
            1. Android
         3. Photo Compression
      3. Website Client
         1. Hardware Overview
            1. Storage
            2. CPU
            3. Memory
            4. Wi-Fi Connectivity
            5. Bandwidth
         2. Browser Capability and Operating Systems
      4. Web API
         1. Java
         2. AWS Elastic Beanstalk
         3. Apache CFX with Tomcat
      5. Website
         1. Java
         2. AWS Elastic Beanstalk
         3. Spring MVC with Tomcat
3. Identification of Case Study
   * 1. Average Family
        1. Moving across town < 20 miles
        2. Need to move approx. 2,200 sq. ft (average house size)
        3. 3 persons and the family dog
        4. Needs moving vehicle because too much to fit into vehicles
        5. Moving Furniture
        6. Need to accurately tell costs because cost is important
        7. Friends or family members may collaborate on the load plan
4. Product Prototype Description  
   TODO: Figure this out
   1. Prototype Architecture (Hardware/Software)
   2. Prototype Features and Capabilities
   3. Prototype Development Challenges
5. Glossary

Algorithm - A finite sequence of well-defined, computer-implementable instructions, typically to solve a class of problems or to perform a computation.

Analytics - The analysis of data, typically large sets of business data through mathematics, statistics and computer software.

Artificial intelligence - The capacity of a computer, robot, or other programmed mechanical device to perform operations and tasks analogous to learning and decision making in humans, as speech recognition or question answering.

Chat-bot - An automated software designed to imitate human interactions and provide information to the user.

Equilibrium - A state of balance due to the equal action of opposing forces, in this case weight within a moving truck.

Heat map - A representation of data in the form of a map or diagram in which data values are represented as colors.

Machine learning - a field of computer science that aims to teach computers how to learn and act without being explicitly programmed. More specifically, machine learning is an approach to data analysis that involves building and adapting models, which allow programs to "learn" through experience. Machine learning involves the construction of algorithms that adapt their models to improve their ability to make predictions.

Packing problems - Are a class of optimization problems in mathematics that involve attempting to pack objects together into containers. The goal is to either pack a single container as densely as possible or pack all objects using as few containers as possible.

Photogrammetry - Photogrammetry is the science and technology of obtaining reliable information about physical objects and the environment through the process of recording, measuring and interpreting photographic images and patterns of electromagnetic radiant imagery and other phenomena.

Professional movers - Professionals who move all your belongings for you from one place to another.

1. References
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TODO: Convert these to APA References

<https://www.hsh.com/homeowner/average-american-home.html>

<https://www.census.gov/data/tables/time-series/demo/families/households.html>