

## Abstract

The Smart Evaluator of MRO Supplies (SEMROS) is a web-based software solution that analyzes industrial tools and their vending possibilities. SEMROS aims to streamline inventory research for sales teams, reducing manual data gathering and vendibility determination. To begin, users simply upload a basic item inventory spreadsheet, and start the program. From there, SEMROS uses web scraping and ChatGPT to gather key data about the various tools including dimensions, weight, and fragility. Each item is then evaluated based on the collected data, and the optimum storage method is calculated.

## Introduction

Our sponsor specializes in inventory management solutions. Their primary mission is to provide clients with advanced tool management solutions using industrial-grade, highly customizable vending machines. Our sponsor's sales representatives and personnel spend many man-hours gathering and analyzing item data based on a client's inventory in order to provide them with appropriate hardware solutions. Our team was tasked with developing a solution that automates this process.

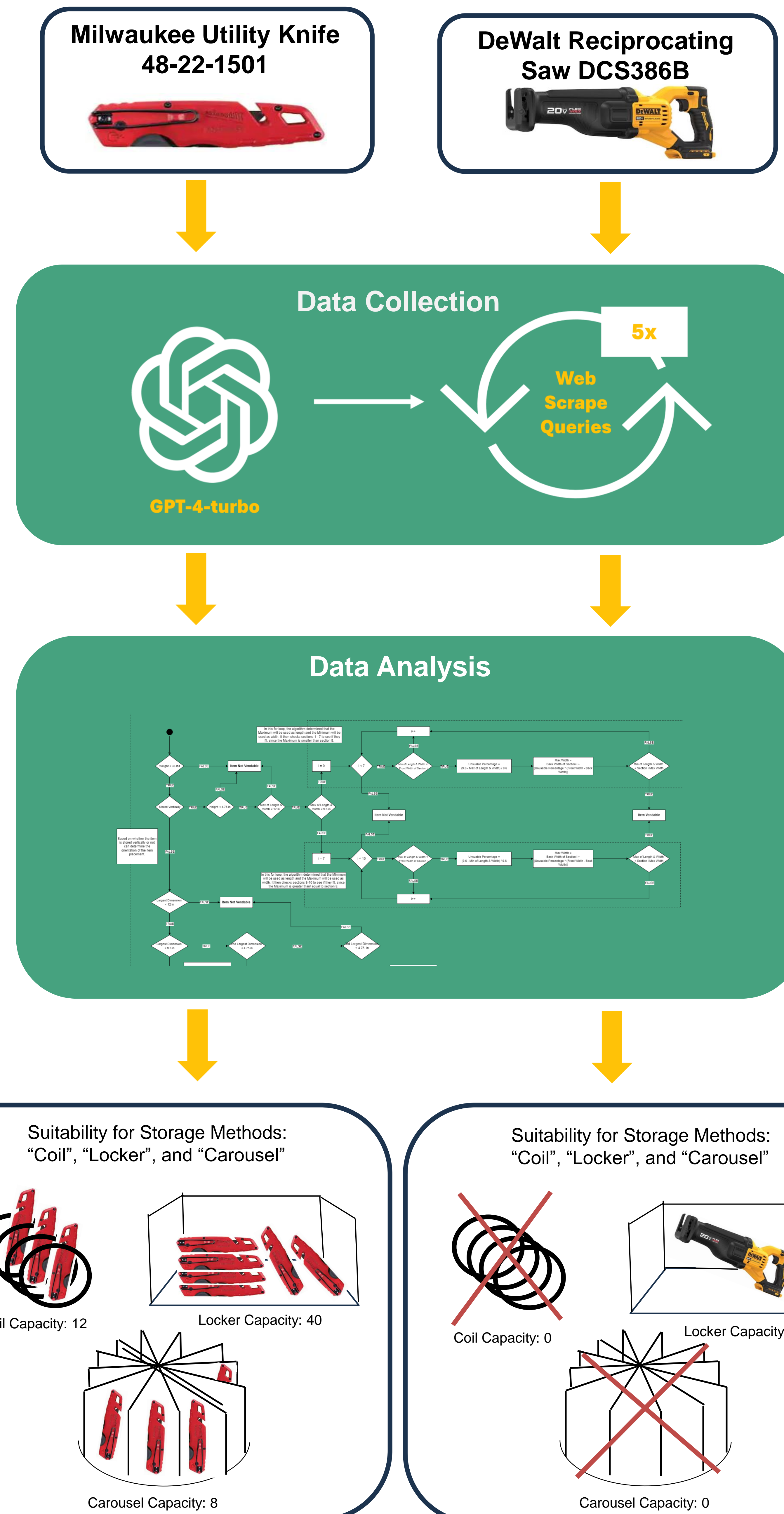
## Project Goals

- 1) Data Generation and Collection:** algorithms that would search the Internet for key information on specified items
- 2) Vendibility Analysis:** Develop a system that calculates vendibility possibilities for the three primary vending/tool storage methods: "coil", "locker", and "carousel".
- 3) Front-End:** Develop a user-friendly front-end interface that uploads and exports inventory spreadsheets with calculated data.

## Materials and Methods

The Smart Evaluator is structured using a Node.js backend and React frontend, with a mixture of vanilla CSS and Tailwind for styling/layout. Additionally, a MongoDB cloud database is used to store all imported and eventually generated data. To generate data, the system parses limited information given about an item and performs a search engine query. The query will provide sites that keywords can be found on. Then, web-scraping calls are made on each of these sites, where 50 words on each side of keywords are collected. This is then loaded into a ChatGPT call that finishes gathering and sorting the data. Once data is found on an item, then the system will perform a vendibility analysis. Based on its weight, height, depth, length, and other critical physical properties, the system will mathematically determine if the item is suitable for placement in a selection of tool vending machines.

## Results



## Results (Continued)

- Users may upload .xlsx and .csv files into the software, which will be displayed in a table.
- Users may perform data generation and vendibility analysis, which updates the table and software database.
- Users may export the generated information as an .xlsx file for further use.
- Users may access old sessions via menu screen.

## Conclusions

The development of the Smart Evaluator of Indirect Supplies has demonstrated promising results and capabilities in automating data collection and vendibility assessments, in which it is able to gather more than 50% of appropriate data for each item. Vendibility tests have also provided feasible insights into item suitability for tool vending machines, which will streamline research and decision-making processes for sales representatives. Overall, SEMROS's current state and ongoing refinement creates a reliable platform for our sponsor's employees, in which manual effort is reduced and productivity is enhanced. Future improvements to this system can include adding AI generated confidence values, human validation, and more spatial reasoning to our algorithms.

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