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Data Science Project Lifecycle - Group Coursework

Enhancement Report

Understanding Communities In Need

**Introduction to the Project** (*Rawad, Mourad, Kel, Bhavjot*)

The global sneaker industry is a major contributor to environmental degradation, responsible for 1.4% of global greenhouse gas emissions and almost as much as the aviation sector's 2.5%. Every year, 20 billion pairs of shoes are produced, yet 300 million end up in landfills, contributing significantly to waste and pollution. Coupled with this is the social issue of footwear accessibility, particularly for individuals facing poverty and homelessness.

Resole, founded in 2018 by Moosa Nsubuga, addresses these dual challenges through its innovative "Reduce, Reuse, Recycle" model. Operating from its Brixton Village Hub, Resole has redistributed over 25,000 pairs of trainers worth £2 million to vulnerable groups, including the homeless, refugees, and low-income families. The organization partners with charities, shelters, and soup kitchens, bridging environmental sustainability and social welfare.

#### **Problem Domain**

Resole faces several operational challenges, including:

* Assessing the efficiency of its redistribution process.
* Determining which regions have the highest demand for footwear.
* Enhancing inventory tracking and management systems.
* Measuring the social and environmental impact of its initiatives.

These challenges highlight the need for systematic analysis and data-driven solutions to enhance Resole’s operations and maximize its social impact.

#### **Objectives**

This project seeks to:

* Analyze socio-economic, demographic, and resource accessibility data to identify high-need areas across the UK.
* Model deprivation levels to predict future demand and optimize distribution strategies.
* Develop a dashboard to visualize key findings, enabling data-driven decision-making.

By addressing these objectives, the project aims to provide actionable insights that strengthen Resole’s capacity to support communities, reduce environmental waste, and promote sustainability within the footwear industry.

***Interview Insights: Understanding Resole’s Needs*** (*Kel, Mo, Bhavjot, Mourad*)

To gain a deeper understanding of Resole’s operations and challenges, we conducted an interview with a Resole representative, who provided valuable insights into the difficulties of footwear redistribution, storage limitations, and the need for a more data-driven approach to optimize distribution.

| **Questions asked** | **Answers** |
| --- | --- |
| What specific key deliverables would be most valuable to Resole's objectives? | **Cleaning**, it needs to be more effective, **financially** and in 5 to 10 years people should donate a lot more shoes. |
| Are there any seasonal or temporal trends in demand for footwear (e.g., higher demand during winter months or back-to-school periods) that we should account for in our analysis? | * In the summertime we get more parents. * People like to save them as memories * We send more shoes to childrens. * Festive seasons, mostly after christmas * From december to february |
| Does Resole collaborate with any other organisations or government bodies that could provide additional data or insights for this analysis? | They are sponsored by crep protect so they have free cleaning supplies |
| How does Resole currently identify and prioritise individuals in need of footwear, and are there specific groups (e.g., children, homeless individuals, low-income families) that receive priority in distribution? | * The key service users for Resole are primarily homeless individuals, as they are the most common group in need of shoes. * The second priority is young people, helping keep them away from crime by providing shoes that promote education and personal well-being. * Refugees are the third priority group, as they often lack access to basic necessities. |
| Have you encountered any significant challenges when it comes to predicting shoe demand | Challenges are in storage and manpower (team capacity) and software issues.  Sending email and phone calls, which is tedious, (it's a long process, it is tiring)  The location also must be feasible for them too. |
| How should we handle missing or incomplete data? | By keeping the critical information |
| Are there specific socio-economic indicators we should focus on? | * Homeless * Young people * Refugees |
| What are the most important insights we need to provide in our analysis? | Anything that helps Resole to expand and provide shoes in priority order of:   * Homeless * young people * Refugees |
| On the easy read word document, why is there an asylum seeker category for employment if ‘asylum seekers’ also are included in the unable to work category? | How it was input by the user in the survey, |
| Will we be able to receive data from the locations that act as the distributors such as soup kitchens, charities? | Forms are given to them and they fill it out. Resole may be able to provide this data from their partnerships |

**Additional Insights from Resole Interview:**

***Key Service Users and Prioritization***

* People have jobs but are still unable to buy shoes, which is a common issue addressed by Resole.

***Operational Challenges***

* Storage and Cleaning:
  + About 30% of shoes are cleaned every month, and 70% is redistributed.
  + Cleaning process: Shoes are cleaned using a brush, steam cleaner, and a solution. The process varies depending on the condition of the shoes.
  + Shoes are checked for condition, and if they are not usable, they are recycled through incineration.
  + Resole has two hubs for managing operations.
  + Bigger brands charge premium prices for shoes, while Resole works to take shoes away from landfills.
  + The cleaning process can take 3-4 hours depending on the shoe condition. Resole also uses a solution for cleaning, with a minimum price of £20 for the cleaning service.
* Inventory and Distribution:
  + Shoes are stored manually in a storage space.
  + Resole works with food banks and soup kitchens to help identify and prioritize those in need of shoes. They use forms filled out by these partners to gather information on the types and sizes of shoes needed.
  + The organization also sends out appeals for children’s shoes to increase supply.
  + Shoes are distributed based on size, with a focus on size 7 to 11 for adults.
  + Resole’s ideal outcome is a more financially, environmentally, and time-efficient system that involves working with other communities to make a difference and increase awareness.
  + Resole has a circular system for intake and outtake, but they don’t have enough shoes to meet the demand.

***Cleaning Process and Manual Effort***

* Cleaning and Storage:
  + The cleaning process involves brushes, steam cleaning, and applying a solution based on shoe condition.
  + Shoes that are not in usable condition are recycled by incinerating them.
  + Manual labor is involved in both cleaning and storage processes.
  + It can take 3-4 hours (sometimes 2-3 hours) to clean a batch of shoes.

***Cost and Financial Considerations***

* Resole’s goal is to distribute shoes cost-effectively to those in need.
* Packaging for customers paying for cleaning services is important, as it adds a sense of value to the product.
* The minimum cost for cleaning is set at £20.
* Resole has a limited number of people working on cleaning, with a maximum of 4 people involved in the process.

***Outreach and Partnerships***

* Resole works with a range of community organizations, including food banks and soup kitchens, to identify and prioritize individuals in need of shoes.
* They gather information about shoe sizes through forms filled out by these partners.
* Resole regularly works with partners in Manchester, Birmingham, and other cities, though they only have data for London.
* Resole collaborates with sneaker events and receives shoes when people move to new places, which helps increase the quantity and quality of the shoes available for redistribution.
* Shoe donations also come from people who attend sneaker events.
* Resole considers those on universal credit for shoe donations, ensuring that even individuals who are receiving social benefits are not excluded from support.

***Seasonal Trends and Demand***

* There is also a spike in demand during festive seasons.
* During the summer months, Resole receives more requests, particularly from parents for children’s shoes.

***Data and Partner Collaboration***

* Resole uses data from partners like food banks and soup kitchens to determine the sizes of shoes needed.
* Resole has the potential to receive data from their locations, as the food banks and charities use surveys to track their stock and can share this information.

***Data Collection*** (*Mo, Rawad, Kel*)

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The majority of data collected was sourced from government websites, such as commons library.

See below for a link to a table detailing datasets , sources and reasons for collection:

[Data set sources and reasons for choice - Google Docs](https://docs.google.com/document/d/1C4MEDImYRdOyVx53osZkVjW7Jyj3yx3a7gTpttI-Ks0/edit?tab=t.0)

For research part, talk about impacts…

Show how you search for the datasets.

You have to present your data here. For any datasets we decide on.

Someone has to define the data requirements, what data do we need.

Like additional variable it does not have, and stuff like that.

We have to have risk assessment, contingency plan, go back to marking scheme

We need to know who is doing what

Provide a link to it as well of the drive.

***Data Integration and Cleaning***(*Mourad, Bhavjot(supporting)*)

***Preliminary Analysis***(*Bhavjot, Mourad(supporting)*)

***Project Plan***

*Gantt Chart:*

(These two will be provided once completed)

*Test Plan/Meeting Minutes:*

References -

* <https://resole.org.uk/>