Decision Support System

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Project Proposal

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Abstract

In this proposal, we describe our project and its goals. The project on Decision Support System will be executed under the aegis of the MRCC (Magdeburg Research and Competency Center) department and the supervision of Mr. Mathhias Volk. We outline a methodology for our proposed project, how we would evaluate the results and the benefits of this research.

1 Introduction

In today's contemporary scenario the use of software for data management is trivial for all businesses and institutions. And having the appropriate software for all the requirements becomes increasingly difficult seeing the range of products available in the market before. Each software has its own features, hardware specifications, implementation ease and maintenance effort. And different users seek to use the software in different ways and finding the best option available in the market, according to your budget becomes the most Important driver for software selection.

SAP is the industry giant in serving large and small businesses for all their user and data management tools. The German software company is known for their software that can be used to track customer and business interactions. Its Enterprise Resource Planning (ERP) and data management programs are also widely used in commercial and non-commercial places. It is quite aptly named Systems, Applications and Products (SAP).

As a motivation, we know that some small scale companies would also like to opt for cheaper alternatives that don't cost a fortune to develop And maintain. Since they are just starting, they cannot afford to purchase or license the use of SAP products, or cannot create an entire ecosystem where each SAP product can be deployed in the company, it becomes imperative to find out which products exist in the open market that are worthy and appropriate alternatives for such products.

1.1 Problem of Interest

SAP produces and sells software that is apt, easy to use and that can be moulded to the size and requirements of the company. But for some companies it would

be preferable to opt for other tools available in the market. The reasons could include the price factor, deployment process, customisability etc. So this is a real need that the alternatives of SAP products are known and classified in a database where referencing and usage could be extracted easily. Since such a simple query and response system does not exist, we would focus our attention on it. Also since there is no universal database for SAP that classifies and arranges them in clusters/classes for generating knowledge that will form the basis of our project repository.

1.2 Problem Statement

In this project, we aim to create a tool where the user can find out alternatives to the SAP products available in the market today. The goal is to find comparative products at a more affordable price or just to provide the options to the users to be able to choose competitive products in the market.

And we propose to create a system with a repository of SAP products that are classified according to their key features and uses. And then we create a repository of SAP-like products in the market today. We match the features like price, user interface, etc and display them to the user when the query is executed.

2 Motivation and Benefits of this Research

- **Price:** The SAP products are proprietary and expensive in effect. Sometimes the deployment and maintenance costs over the years exceeds the budgets specified by any company for such expenses. In other cases, some companies cannot associate with a direct competitor or associate with some products because of company policies could benefit from using the substitutes available in the market.

- **Benefit for Small Companies:** Certain companies that are starting out might not be able to licence or buy the SAP products. Or they might need customisation according to size and company's needs could do better with the other possible software that our tool could recommend them.

- **Deployment, Support and Maintenance:** The process of deployment of a particular SAP product requires the hardware and infrastructure that not all companies or institutes would be able to arrange. The maintenance costs and man-power is also sometimes a constraint that the unconventional products may be able to provide.

- **Open Source:** It is very important for some customers to opt for open source software that can be moulded according to the specific demands of the company and the job at hand. The freedom, and security and customisation ability that an open source software provides can seldom be compared with the features of a proprietary product.

- **Suitable Requirements:** SAP has had products in the market for a very long time that have received updates and mods, but can still be tailored according to different requirements of the user/company.

3 Approach Chosen

Our plan is to create a comprehensive repository of SAP products and respective alternatives, classify them on the basis of common features using Machine Learning techniques. Meanwhile, for querying, we would use Information Retrieval methodologies to parse the user query, break it to keywords and match the keywords in our system to give the best match result.

3.1 Methodology

The methodology that we plan to follow consists of 4 basic steps:

- **Data Gathering:** It will be imperative to find all the products of SAP that exist in the market for commercial and non-commercial use.
- **Feature Extraction and Choice:** After the software is identified, we would proceed to identify the features of that software that we would be able to build the classifier on.
- **Classification:** Finding the common features, building a model and a classifier to properly manage the data at hand.
- **Information Retrieval:** Building on the basics of IR, we would find the requested features from our repository and classified data. Creating knowledge from data using machine learning algorithms as well.
- **User Interface and Query:** Using NLP, and basic information retrieval techniques to display the search results of the query at hand.

3.2 User Interface and Evaluation Measures

The final assessment of the efficiency of the tool will be based on the query results for finding alternatives. When the search query is input, it will move through the information retrieval system and search for the key terms in our list of features. The alternative with the most matching features will be displayed to the user. The details of the alternative tool will also be displayed for ease of understanding and user satisfaction. In case that the search terms do not match entirely, the closest search result and features will be displayed.

The evaluation will be done on the basis of the best match scenarios and test cases for different variants of SAP products. We will try to test the limits of the system by querying using key terms, natural language and similar key terms for finding its robustness. That way we will be able to ensure that users with different levels of technical and business knowledge can use the software well.

4 Why This Approach was Chosen

This project will be an extension of the techniques that our data science degree consists of. We can implement in a hands-on manner to create something that can possibly have a *commercial application*. When executed ideally, this tool could work as a holy grail of searching and finding various replacements for the SAP products. The idea of the project can be likened to creating ontologies that are classically easily interpret-able. But ontologies combine the concepts, attributes, and knowledge sets of the given data and show implicit relationships between objects under study. The approach that we have chosen builds on the concept of an ontology but uses the basics of *machine learning* algorithms to find relationships within our data, does the *classification* based on the most important features and will retrieve results based on the user's query.

Since SAP products are varied and meant for a wide range of tasks, companies and purposes, it becomes even more complex to find the best choice of software as its replacement. Our initial knowledge about SAP products needs to be apt and wholesome so that even distinctive features can be matched from the very helpful and *comprehensive Alternatives' repository* for the best match and sustained user satisfaction. It will be a mix of exact match and best match search results based on the extracted features.

In *very large business applications*, there are multiple tasks that come under Human Resources (HR), Accounting, Marketing and Logistics etc. which each require a dedicated software. Then these applications need to work in an integrated manner for smooth operations of a company. The alternatives would be beneficial for the general public and common people including students and freelancers etc, who would prefer using substitutes that our tool would offer. Sustainability of the software is also a string driver for finding the most suitable software for each person and institution.

5 Deliverables

- Finding the best match results for other queries
- Natural language processing techniques for user queries
- Details of SAP substitute and its features
- Apt classification and accurate results
- Scalable model for classifying new training examples