CAP2024/Insiders

Fraunhofer IESE

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GenerAItor

Capstone 2024

Software Requirements Specification

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Section 1: History

Name	Date	Reason for Change
All Requirement Engineers	2024-10-06	The initial draft of the document
All Requirement Engineers	2024-10-14	Changes in the document content
All Requirement Engineers	2024-10-23	Refinement in requirements
All Requirement Engineers	2024-11-01	Refinement in requirements
All Requirement Engineers	2024-12-03	Refinement in project scope

Section 2: Purpose

The purpose of this project is to enhance the functionality and improve the user experience of "generAItor," an AI-powered tool designed for automating the extraction of information from various document types, including PDFs, images, and DOCX files. By leveraging advanced AI technologies like ChatGPT, Mistral, Claude.ai, and its own "AutoExtractor," generAItor enables users to automate data extraction workflows, making it a valuable solution for individuals, organizations, and consultants aiming to optimize document management processes.

This project focuses on two key areas. First, it aims to improve usability by developing a comprehensive tutorial that guides users through the tool's functionalities. The tutorial will ensure that both technical and non-technical users can seamlessly onboard and navigate the system. In addition, efforts will be made to standardize the layout and formatting across the interface, providing a more consistent and intuitive user experience.

The project also introduces an important enhancement to the tool's document extraction capabilities. Users will be able to group multiple selected items into a single field, improving flexibility in handling complex data structures, such as multi-part keys or scattered data points. This enhancement is expected to increase the accuracy of AI-driven extraction and streamline the training process by allowing users to provide clearer data input for automation.

Section 3: Project Goal

The goal of this project is to create a system that people find attractive and easy to use. We're committed to making the system intuitive and providing clear guidance

with a tutorial so that users feel confident and well-informed while working on GenerAItor. On top of that, we aim to enhance the existing functionalities of the system, specifically focusing on better field recommendations and improving the understandability of the recommended data.

Section 4: Project Scope

This project is focused on two key objectives: empowering users to independently operate the tool and enhancing the clarity of the data presented to them. To support user training, a novel tutorial system will be developed to guide users through the service creation process. This system will include an option for users to enable or disable the tutorial based on their preference. To improve data comprehensibility, the project will leverage the capabilities of advanced language models, specifically ChatGPT from OpenAI. This will include providing meaningful names for extracted fields and offering users pre-selected fields deemed important for subsequent training steps. Together, these enhancements aim to make the GenerAItor more intuitive and user-friendly, significantly improving the overall service creation process and user experience.

Section 5: Scope of the Document

This document covers the project purpose, stakeholders, project constraints and assumptions. GenerAItor develops an advanced document management system, using both frontend and backend, through specific steps such as service creation, training, measurement and deployment

Section 6: Stakeholders

Stakeholders are the key project drivers, where each stakeholder has the capacity to influence the entire project. During the requirements engineering interviews, we have

obtained the information regarding all the stakeholders and each of them have been described as below:

Stakeholders:

6.1 Insiders Technologies:

They are the product owners having a direct influence on the project. They act as a client to 'RPTU Students' which makes them the decision maker, requirements elicitation, validator and negotiator.

6.2 Fraunhofer IESE:

They are responsible for providing guidance to the 'RPTU Students' and supervising the entire project. They play a key role in ensuring that the project is conducted with certain quality and standards by assisting the students with crucial resources. Importantly, facilitates the communication between 'Insiders Technologies' and 'RPTU Students' to conduct the entire project smoothly.

6.3 RPTU Students:

They are responsible for delivering the fully functional product by satisfying all the functional and non-functional requirements provided by the client – 'Insiders Technologies'. Moreover, Requirements Engineering, functionality development, planning the entire life cycle of the project with detailed breakdowns of each iteration cycle, overseeing and managing the teams to obtain the expected outcome during the whole project, etc. are to be considered under the responsibilities.

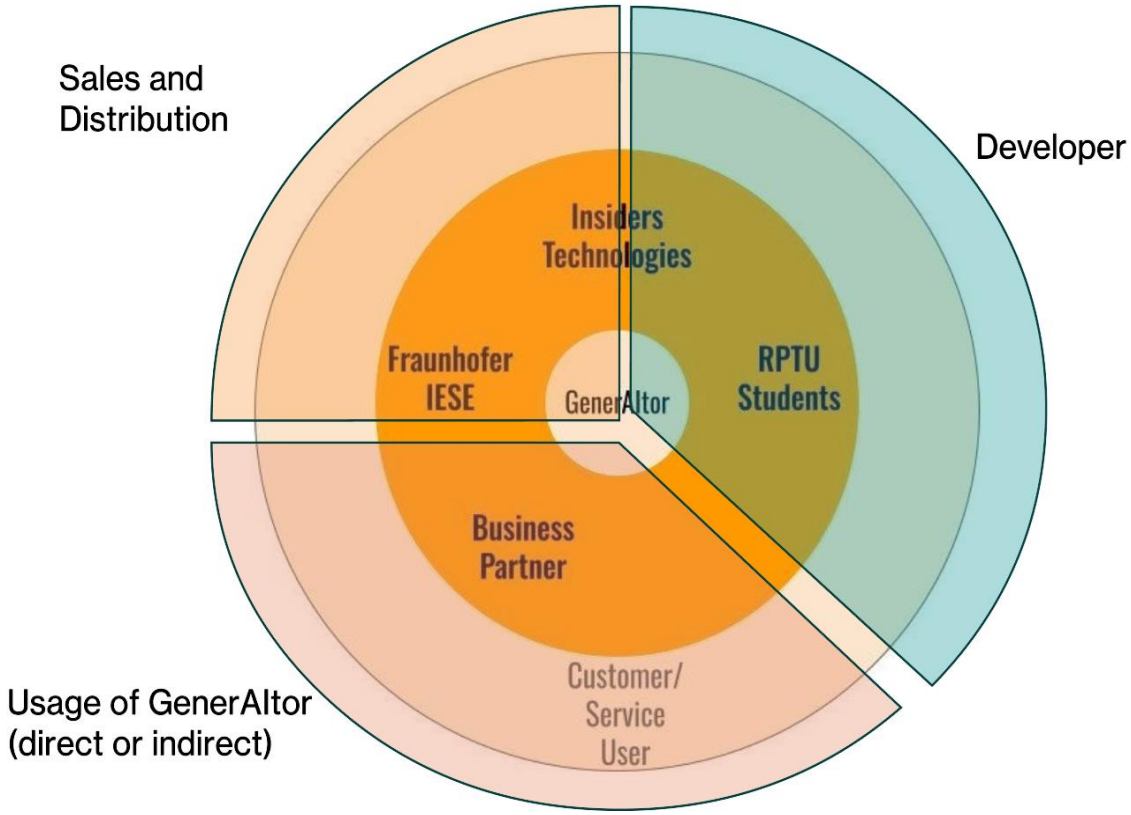
6.4 Business Partners:

They are the type of users who are directly responsible for interacting and using GenerAItor. They use the system to create services for their specific use cases. The primary intention of creating these services is to fulfill the needs of their own customers.

6.5 Customers/Service Users:

They are the type of users who utilize the deployed services which are created by the business partners. The intention of these user groups is to extract information from the documents by means of automation.

Stakeholders Onion Model representation:



Section 7: Project Constraints

7.1 - Time Constraint: The project must be completed by December 16, 2024. Iteration meetings are scheduled for October 1, 2024; October 8, 2024; October 22, 2024; November 5, 2024; November 19, 2024; and December 3, 2024. The final presentation is set for December 16, 2024.

7.2 - **Developer Inexperience**: Limited experience among the development team could impact the project timeline and quality. This may lead to longer development

periods, potential coding errors, and a steeper learning curve for implementing features or best practices. Ensuring adequate training and mentorship could be necessary to mitigate these risks.

7.3 - **Technical Limitations**: Constraints related to existing technology stacks or infrastructure could restrict the use of certain tools, frameworks, or integrations.

Section 8: Relevant Facts and Assumptions

8.1 Assumptions:

8.1.1 Large Language Model (LLM): The assumption of an appropriate language model (LLM) to be available for selection. This model must be able to accurately parse and understand the documents that the service will process.

8.1.2 Tool overview: The *generAItor* tool is an AI-driven document analysis solution designed to extract structured data from unstructured documents, including but not limited to PDFs, images (converted to JPEGs), and DOCX files.

8.1.3 Documents Datatype: The Assuming that training documents are structurally similar. This helps the system identify patterns and improve the extraction accuracy.

8.1.4 Service Deployment: It is assumed that after successful extraction testing, the service can be deployed to Insider Technology's cloud infrastructure.

8.1.5 Document Processing: The system is expected to process structured and semi-structured documents with a high degree of accuracy and efficiency. The primary objective is to streamline the extraction of key information from documents, minimizing manual input.

8.1.6 AI Technologies: The tool utilizes advanced AI technologies such as ChatGPT, Mistral, Claude.ai, and the proprietary "AutoExtractor" to facilitate automated data extraction.

8.2 User Workflow and Interaction

8.2.1 Fact: The tool's workflow requires users to upload a minimum of five similar documents to train the AI model. Subsequently, a test document is uploaded to evaluate automation and detection rates prior to deployment.

8.2.2 Assumption: Users are assumed to consistently adhere to this workflow for achieving accurate results. The tool presupposes that users possess the basic skills needed to select relevant fields and train the AI system accordingly.

8.3 System Deployment

8.3.1 Fact: Upon achieving satisfactory extraction results, users have the option to deploy the AI service on their preferred cloud infrastructure.

8.3.2 Assumption: The tool is primarily designed for cloud-based deployment, and users are expected to have access to suitable cloud environments for deploying the service.

8.4 End-User Profiles

8.4.1 Fact: The primary target audience includes business partners and customers/service user (described in section 5), seeking to automate document processing workflows (e.g., insurance companies).

8.4.2 Assumption: The system assumes that users will have varying levels of technical expertise. Non-technical users will benefit from the tutorial for onboarding, while more technically proficient users will require minimal assistance in configuring the tool.

8.5 Document Types and Processing

8.5.1 Fact: The tool predominantly processes PDFs and image files converted to JPEG format). While DOCX files are supported, their usage is expected to be limited.

8.5.2 Assumption: It is assumed that the documents provided for training are sufficiently similar in structure to allow the AI system to learn consistent extraction patterns across the uploaded set.

8.6 Usability and Interface Consistency

8.6.1 Fact: The project also focuses on enhancing the user experience by improving the consistency of the interface's layout and formatting across all sections of the tool.

8.6.2 Assumption: Standardized and consistent formatting is assumed to reduce user confusion, thereby improving navigation and overall usability. This will lead to higher user satisfaction and operational efficiency.

Section 9: Functional Requirements

9.1 UI/Frontend

FUNC-FE-001: To develop a tutorial system which aims to reduce efforts in user onboarding process.

1. The tutorial system should provide end-to-end guidance to the new user
2. During each step of service creation, the user should be presented with relevant information to perform the necessary tasks.

FUNC-FE-002: Creation of help page for the users to resolve their service creation issues.

3. The help page should contain FAQ's for resolving the common issues faced during the service creation while using the GenerAItor.
4. The help page should contain

9.2 Backend

FUNC-BE-001: After the completion of extraction process, **s**ystem should be able to propose accurate field names for the extracted fields.

FUNC-BE-002: The system should provide the user with a set of pre-selected fields which will be unique to the type of document the user has uploaded for extraction.

FUNC-BE-003: The system should be able to group the extracted fields based on the relationship of the fields.

Section 10: Non-functional Requirements

10.1: Modular Architecture:

NFUN-MA-001: The developed functional requirements should be modular i.e. independently functional so that it can be seamlessly integrated with the existing architecture of the GenerAItor.

10.2: Usability Requirements:

10.2.1: User Friendly Interface

NFUN-US-002: The tutorial system should be intuitive and easy to use for service creation.

10.2.2: Accessibility

NFUN-US-003: The tutorial system should be accessible to the user during the entire service creation process. At any point in time, the user should be able to revisit the tutorial to get assistance.

10.2.3: Scalability

NFUN-SC-004: The tutorial system should be designed to allow clients to add additional tutorials as new functionalities are introduced to the system.