**Business Case**



V-TRAIN

VODAFONE TEST DATA RETRIVAL AND

INTELIGENT ALLOCATION NETWORK

March 4th, 2025 – V0.1

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# Executive Summary

# 1.1 Problem we are trying to solve

The **Global Test Data Management Market** was valued at **USD 1.2 billion in 2023** and is projected to grow at a **CAGR** (Compound Annual Growth Rate) **of 12.1%** from 2024 to 2033, reaching **USD 2.55 billion by 2032**.

**Key Growth Drivers:**

1. **Complexity of Applications**: Increasing intricacy of applications and systems necessitates thorough testing, driving demand for efficient test data management solutions.
2. **Agile and DevOps Adoption**: The widespread adoption of agile and DevOps methodologies accelerates the need for quick and frequent testing cycles, highlighting the importance of robust test data management.
3. **Data Privacy and Security**: Growing concerns about data privacy and security regulations push organizations to implement strong data masking and encryption methods.
4. **Optimization of Test Environments**: The need to optimize test environments and reduce infrastructure costs propels the market, as effective test data management helps in efficient data provisioning.

**IT & Telecom** industry relies heavily on test data management solutions to ensure the quality and performance of software applications, networks, and communication systems. With rapid technological advancements, IT & telecom is expected to hold a significant share in the market.

The communication with Vodafone local markets testing leaders and stakeholders, directed us to the real and common problem. Number of local markets has solutions for data creation, anonymization of data within the test environments. However, there are complex and challenging backend process to get the correct data for testing.

We had good conversations and interviews with the testing team and identified below challenges in getting the correct data for test case execution:

1. Limited knowledge of backend systems
2. Limited visibility of data completeness
3. Complex data retrieval processes
4. Time-consuming retrieval
5. Data reservation for specific users
6. Ensuring data relevance and freshness
7. Managing vast and varied data

The market research tells that there are some of the tools within the market as available with customized self-serv utilities, however there is no off the shelf product OR solution is available in market which will help in converting natural language communication to the technical requirements and get the data runtime with reservation functionality. To use the majority of self-serve utilities/tool need technical/database terms knowledge and need some training to use those.

# 1.2 Proposed solution

Future Solution

Our solution, ***V-TRAIN*** *(Vodafone's Test-data Retrieval and Intelligent Allocation Network)*, is a personal, smart Assistant, for an individual to help with providing and reserving required test data by understanding the data requirements through the natural language.

The proposed solution, ***V-TRAIN*** *(Vodafone's Test-data Retrieval and Intelligent Allocation Network)*, is a personal, smart Assistant, for an individual that allows testers to request specific test data through natural language conversations. The ***V-TRAIN*** interprets user requests, translates them into predefined technical terms, and constructs queries to retrieve relevant data and reserve the data for the individual. Key features of the chatbot include:

* **User-Friendly Interaction**: No specific syntax knowledge required; testers can interact with the ***V-TRAIN*** using natural language.
* **Real-Time Data Retrieval**: The ***V-TRAIN*** provides instant access to relevant test data.
* **Data Reservation**: ***V-TRAIN*** ensures that retrieved data is reserved for specific users, maintaining data integrity.
* **Adaptability**: The ***V-TRAIN*** can be configured for various applications across different markets with minimal changes.

We can put some screenshots with functionality explanation once the prototype is ready …

# 1.3 Anticipated Outcomes/ Expected revenue benefit

If ***V-TRAIN*** is implemented, the end users will see increase in the speed and productivity of overall testing phase as the they will get the accurate test data on runtime without spending lot of time in following the complex process. Also, ***V-TRAIN*** helps people to communicate in local business terms and not required to know the complex technical terms OR parameters to find the data.

Vodafone will benefit from deploying ***V-TRAIN*** to its employees, as productivity will rise, and testing delivery will become faster without any adjustment to workload. ***V-TRAIN*** is very simple to use, with a user-friendly design and options, that employees will not see this as “another app”, but as the assistant and coach we have built it to be.

# 1.4 Justification

***V-TRAIN*** should be implemented because of the tremendous impact it can achieve, whilst taking very little of a tester’s time.

As of now there is no option available in the market which can be readily used as conversational bot for test data retrieval and reservation. We have selected the ***V-TRAIN*** as the features of ***V-TRAIN*** are simple, user-friendly and unique. It’s and AI, which try to understand the tester’s request by the prompt in natural language, pick the business terms and convert them into a technical term, build a runtime query and run that on a data base to find the requested test data along with the reservation of that data for this tester. This will assist tester in optimizing their test data retrieval time, including:

* Communication in natural language
* Converting business teams into technical terms and queries
* Real time data retrieval
* Ability of Data Reservation
* Adoptability to multiple applications/stacks, and local markets

Even if a tester can save 10 days in a year for test data retrieval, then a local market having ~250 testers can save almost ~600k€ every year. Refer to section 6.4 for more details.

Additionally, if employees can do the same work, but produce it to a higher quality in less time, that would have radical impacts on their work / life balance. Stress should decrease and focus should increase.

# Idea Team

The core team is composed of individuals from different testing experience and background.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Email address** | **Department/Local Market** | **Role** |
| Abhijeet Waghmode | [abhijeet.waghmode@vodafone.com](mailto:abhijeet.waghmode@vodafone.com) |  |  |
| SatParkash Maurya | [SatParkash.Maurya@Vodafone.com](mailto:SatParkash.Maurya@Vodafone.com) |  |  |
| Prashant Dhage | [prashant.dhage@vodafone.com](mailto:prashant.dhage@vodafone.com) |  |  |
| Rahul Bende | [rahul.bende@vodafone.com](mailto:rahul.bende@vodafone.com) |  |  |
| Akshay Yelsange | [akshay.yelsange@vodafone.com](mailto:akshay.yelsange@vodafone.com) |  |  |
| Nilotpal Das | [nilotpal.das@vodafone.com](mailto:nilotpal.das@vodafone.com) |  |  |

As the above team members are experts in software engineering and testing, they understand the real pain of the testers during the execution. These team members have versatile experience in multiple domains and technologies which will give an added advantage of developing the detailed and common user-friendly solution, to be implemented in different local markets, easy to configure for different applications and stacks.

# Problem Definition

# 3.1 Problem Statement

Test data management is a critical aspect of software testing, particularly in non-production environments. Effective test data allows developers to recreate real-world scenarios, ensuring comprehensive testing. However, testers often face challenges such as limited knowledge of backend systems, complex data retrieval processes, and ensuring data relevance and freshness. This paper introduces a chatbot solution to address these challenges.

Testers encounter several issues when retrieving test data from non-production environments:

* **Limited Knowledge of Backend Systems:** Testers may lack in-depth knowledge of data architectures, making it difficult to identify the correct data set.
* **Limited Visibility of Data Completeness:** Testers might not be aware of data gaps or inconsistencies.
* **Complex Data Retrieval Processes:** Retrieving data often involves sophisticated tools and techniques, requiring significant technical expertise.
* **Time-Consuming Retrieval:** The process of fetching accurate and relevant data can be lengthy.
* **Data Reservation for Specific Users:** Ensuring that retrieved data is reserved for specific users to prevent misuse.
* **Ensuring Data Relevance and Freshness:** Maintaining up-to-date data to avoid discrepancies.
* **Managing Vast and Varied Data:** Extracting relevant data from large datasets requires efficient data management practices

# 3.2 Problem Size

Almost 30% of total workforce within the software industry is working on testing the software. All these people need many kinds of the test data into the non-production environments to complete the testing. Every testing scenario has its own pre-requisites to complete the testing. One of the major pre-requisites is test data and the test data should be accurate enough to get the accurate results.

However, majority of QA engineers are not experts in backend, database and associated data retrieval process. Even if some of them are aware of the technical details the data retrieval processes are complex and time consuming.

Considering the complexity and expertise available with the tester, an average of 10 mins time required for a tester to retrieve the data matching to the pre-requisites i.e. almost ~1 to 1.5 hrs a day. If we consider a **Simple project** consists of 5 testers working for 22 days of execution for each release and 4 such releases happening in a year, then the testers are investing almost **82.5 PDs** for test data retrieval. With similar logic for a **Medium project** consisting of 15 testers invests **247.5 PDs** and a **Complex project** consisting of 30 testers investing **495 PDs** for test data retrieval.

Considering the above conditions as on average **18-20%** of the efforts during the test execution are being invested for Test Data Retrieval and making the test data available for test execution.

# Scaled Solution

# 4.1 Market Research

***V-TRAIN*** is personal data Assistant. It will use AI (Machine Learning and Deep Learning) to learn how each tester requests the data, the important factors covered in a prompt, any additional parameters requested by the tester. With the help of information provided by tester in natural language the ***V-TRAIN*** converts all the information into technical parameters and build a run time query. With the help of executing this query on a desired database the required test data matching to the given criteria is retrieved and is reserved for that tester. Currently there is nothing available in the market matching to these features.

However, there are number of applications are available in the market which give flexibility to user write the SQL queries and execute those on the database OR some applications give flexibility to develop self-service utilities. None of them brings in concept of the natural language communication to overcome the technical/backend knowledge.

Broadly speaking, the different applications fall into two categories: Self Service Utility and Flexible Query Search.

Firstly, Self Service Utilities are the utilities developed as frontend UI with having pre-defined criteria and unique technical values of those criteria to select from dropdown list. These utilities has base query already ready at the backend with values are parameters to be picked from the dropdown list. Once all criteria and associated values are selected the query will be executed on application database to find the data matching to all criteria and the results are displayed on the frontend.

However, these applications do not give ability to reserve the data for any specific user. Maintenance and Customization of these utilities needs development skills, and these utilities do not automatically adopt the database changes.

Secondly, Flexible Query Search tools provide user a platform list SQL Developer to build their own query with the user defined criteria to run these queries on application database to search matching results.

In these types of tools reservation feature is not available. Using these tools need good knowledge of database and query development. Maintenance and customization of these tools will be complex and based on connection configurations.

The comparison of Self-Service Utilities, Flexible Query Search tools and ***V-TRAIN*** is given in below table…

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Self Serv Utilities** | **Flexible Query Search Tools** | ***V-TRAIN*** |
| Data Search | **🗸** | **🗸** | **🗸** |
| Data Retrieval | **🗸** | **🗸** | **🗸** |
| Data Reservation | **🗴** | **🗴** | **🗸** |
| Natural Language Communication | **🗴** | **🗴** | **🗸** |
| Business term conversion to technical parameter | **!** | **🗴** | **🗸** |
| Retrieval based on technical parameters | **🗸** | **🗸** | **🗸** |
| Data Profiling Reports | **🗸** | **🗸** | **🗸** |
| Data usage Reports | **🗴** | **🗴** | **🗸** |
| Integrations with other test management tools | **🗴** | **🗴** | **🗸** |
| Use of AI | **🗴** | **🗴** | **🗸** |
| User-Friendliness | **Medium** | **High** | **Simple** |
| Usage Complexity | **Medium** | **High** | **Simple** |

# 4.2 Solution Description

With nothing available in market which matching ***V-TRAIN’s*** vision of “The Personal Test Data Assistant”, the proposed solution is ***V-TRAIN*** designed to streamline the process of test data retrieval for software testers. This interactive ***V-TRAIN*** will leverage natural language processing (NLP) to understand and respond to user queries, making it easier for testers to access relevant test data without requiring in-depth technical knowledge.

**Key Features**

1. **User-Friendly Interaction**: Testers can interact with the *V-TRAIN* using natural language, eliminating the need for specific syntax knowledge. This makes the *V-TRAIN* accessible to users with varying levels of technical expertise.
2. **Real-Time Data Retrieval**: The *V-TRAIN* provides instant access to relevant test data, significantly reducing the time and effort required to fetch accurate and up-to-date information.
3. **Data Reservation**: The *V-TRAIN* ensures that retrieved data is reserved for specific users, maintaining data integrity and preventing misuse.
4. **Adaptability**: The *V-TRAIN’s* architecture is highly configurable, allowing it to be easily adapted to different markets with minimal configuration changes. It supports multiple languages and can handle various data structures and user interactions.
5. **EoD Batch for V-TRAIN update:** The intelligent batch job designed will be scheduled to run every night (out of working hours) to fetch the changes of the data characteristics to bring ***V-TRAIN*** database in line with application databases.

# 4.3 Implementation Plan

The implementation of the interactive ***V-TRAIN*** will be carried out in two phases:

1. **Minimum Viable Product (MVP)**: The MVP will focus on core features such as database setup, user-friendly interaction and real-time data retrieval. This phase can be completed within 90 days.
2. **Final Product**: The final product will include advanced functionalities like data reservation, EoD Batch for updates and adaptability for various applications. This phase will take an additional 6 months to complete.

**Multi-Stack / Applications Adaptability and Rollout Strategy**

The *V-TRAIN* is designed to be highly adaptable and scalable, making it suitable for implementation across multiple applications / stacks. The rollout strategy includes:

1. **Pilot Implementation**: Start with a pilot implementation in one or two applications to test the *V-TRAIN’s* functionality and gather feedback.
2. **Feedback and Iteration**: Collect feedback from the pilot implementation to refine and enhance the *V-TRAIN’s* features.
3. **Training and Support**: Provide comprehensive training and support to testers in each stack.
4. **Gradual Expansion**: Roll out the *V-TRAIN* to additional applications / stacks in a phased manner.
5. **Monitoring and Maintenance**: Establish a robust monitoring and maintenance framework to ensure the *V-TRAIN* operates smoothly across all applications /stacks.

# 4.4 Value Proposition

**Efficiency and Time Savings**

The ***V-TRAIN*** significantly reduces the time and manual effort involved in managing test data. Testers often face challenges such as limited knowledge of backend systems, complex data retrieval processes, and ensuring data relevance and freshness. By automating these processes, the *V-TRAIN* allows testers to quickly and easily access the data they need, freeing up valuable time to focus on more critical tasks. This efficiency can be quantified through faster project timelines and reduced labor costs.

**Cost Savings**

Implementing the ***V-TRAIN*** leads to substantial cost savings for the organization. By streamlining the test data retrieval process, the *V-TRAIN* minimizes the need for extensive manual intervention and reduces the likelihood of errors. This results in lower operational costs and fewer resources required for data management. Over a five-year period, these savings can be significant, providing a strong return on investment.

**Improved Data Accuracy and Integrity**

The ***V-TRAIN*** ensures that retrieved data is accurate, relevant, and up to date. It addresses issues such as data gaps, inconsistencies, and the need for data reservation for specific users. By maintaining data integrity and preventing misuse, the chatbot enhances the overall quality of test data, leading to more reliable testing outcomes and better software quality.

**Enhanced User Experience**

The ***V-TRAIN*** offers a user-friendly interface that allows testers to interact using natural language, eliminating the need for specific syntax knowledge. This makes the chatbot accessible to users with varying levels of technical expertise, improving their overall experience and satisfaction. The real-time data retrieval feature further enhances user experience by providing instant access to relevant information.

**Scalability and Adaptability**

The ***V-TRAIN*** is designed to be highly adaptable and scalable, making it suitable for implementation across multiple Vodafone markets. Its configurable architecture allows it to handle various data structures, languages, and user interactions with minimal changes. This scalability ensures that the chatbot can efficiently manage and retrieve relevant test data from large datasets, providing accurate and up-to-date information to testers across different markets.

**Strategic Alignment with Vodafone's Priorities**

The ***V-TRAIN*** aligns with Vodafone's strategic priorities of Customer, Simplicity, and Growth in several ways

**Customer:**

* **Enhanced Customer Experience:** The *V-TRAIN* streamlines test data retrieval, making software testing more efficient and accurate. This results in higher-quality software products, leading to more reliable and bug-free applications, enhancing customer satisfaction with Vodafone's services.
* **Faster Issue Resolution:** Real-time data retrieval capabilities enable quicker identification and resolution of issues during testing, ensuring a smoother and more seamless customer experience.
* **Personalized Interactions:** The *V-TRAIN’s* natural language processing (NLP) capabilities allow it to understand and respond to user queries in a personalized manner, making interactions more intuitive and user-friendly, ultimately benefiting the end customers.

**Simplicity:**

* **User-Friendly Interaction:** The *V-TRAIN* allows testers to interact using natural language, eliminating the need for specific syntax knowledge, simplifying the test data retrieval process.
* **Real-Time Data Retrieval:** The *V-TRAIN* provides instant access to relevant test data, significantly reducing the time and effort required to fetch accurate and up-to-date information, enhancing operational efficiency and simplifying the overall testing process.
* **Data Reservation:** The *V-TRAIN* ensures that retrieved data is reserved for specific users, maintaining data integrity and preventing misuse, simplifying data management.

**Growth:**

* **Scalability and Adaptability:** The *V-TRAIN* is designed to be highly adaptable and scalable, making it suitable for implementation across multiple Vodafone markets. Its configurable architecture allows it to handle various data structures, languages, and user interactions with minimal changes, supporting Vodafone's growth strategy.
* **Operational Efficiency:** By automating the test data retrieval process, the *V-TRAIN* reduces the time and effort required for manual data management, translating into cost savings and allowing Vodafone to allocate resources more effectively, supporting business growth and expansion.
* **Innovation and Competitive Advantage:** Implementing advanced technologies like the *V-TRAIN* demonstrates Vodafone's commitment to innovation, enhancing the company's reputation as a technology leader and providing a competitive advantage in the market.

**Quantifiable Benefits**

The value of implementing the Test Data Bot can be quantified through various metrics, including:

* **Cost Savings**: Reduced tester costs and operational expenses due to automation.
* **Time Savings**: Faster project timelines and reduced time spent on manual data retrieval.
* **Improved Accuracy**: Enhanced data quality and reliability, leading to better testing outcomes.
* **Increased Productivity**: Testers can focus on higher-value tasks, improving overall productivity and efficiency.

By addressing the challenges faced by testers and providing a comprehensive solution for test data retrieval, the ***V-TRAIN*** offers significant value to Vodafone. It streamlines operations, enhances user experience, and supports Vodafone's strategic priorities, ultimately delivering a substantial return on investment.

# 4.5 Use Cases

The use cases for the *V-TRAIN* are aligned to achieve a complete simplified solution for testers. Some of them are as below…

1. **User Authentication**: Verifying that the *V-TRAIN* correctly handles user login, registration, and authentication processes.
2. **Conversation Flow**: Ensuring the *V-TRAIN* can manage different conversation paths, including handling interruptions and returning to the main flow.
3. **Error Handling**: Testing how the *V-TRAIN* responds to unexpected inputs or errors, such as typos or unsupported queries.
4. **Data Retrieval**: Checking the *V-TRAIN’s* ability to fetch and display data from integrated systems, such as databases or APIs.
5. **Data Reservation**: Checking the *V-TRAIN’s* ability of reserving the data for a specific user on a given date and time.
6. **Task Automation**: Validating that the *V-TRAIN* can perform automated tasks, like raising the service tickets, perform automated process steps to complete the workflows.
7. **Multi-turn Dialogues**: Ensuring the *V-TRAIN* can handle multi-step interactions that require context retention across multiple exchanges.
8. **Personalization**: Testing the *V-TRAIN’s* ability to provide personalized responses based on user data and preferences.
9. **Language Understanding**: Verifying the *V-TRAIN’s* natural language processing capabilities to understand and interpret user inputs accurately, including handling different languages, dialects, and user intents.
10. **Response Generation:** Verifying the ***V-TRAIN’s*** capability to generate relevant and contextually appropriate responses to user queries.
11. **Data Availability / Usage Reports**: Verifying the *V-TRAIN’s* ability to provide multiple statistical information for any type of reports based on given criteria.
12. **Feedback and Escalation**: Checking the *V-TRAIN’s* ability to collect user feedback and escalate issues to human agents when necessary.

# Prototype Overview

# 5.1 Project Description

The ***V-TRAIN*** is designed to address the challenges faced by software testers in non-production environments. The chatbot leverages natural language processing (NLP) to facilitate user-friendly interactions, enabling testers to request specific test data through natural language conversations. The chatbot interprets user requests, translates them into predefined technical terms, and constructs queries to retrieve relevant data. Key features include user-friendly interaction, real-time data retrieval, data reservation, and adaptability for various applications across different markets.

**Development Approach**

The development of the *V-TRAIN* will be carried out in two phases:

1. **Minimum Viable Product (MVP)**: The MVP will focus on core features such as user-friendly interaction and real-time data retrieval. This phase can be completed within 90 days.
2. **Final Product**: The final product will include advanced functionalities like data reservation and adaptability for various applications. This phase will take an additional 6 months to complete.

The development approach involves:

* **Requirement Analysis and Planning**: Define detailed requirements and scope for the MVP and final product.
* **Design and Architecture**: Design the chatbot's architecture, focusing on core features and scalability.
* **Development**: Implement NLP capabilities, real-time data retrieval, and data reservation functionalities.
* **Testing and Quality Assurance**: Conduct unit testing, integration testing, and user acceptance testing (UAT).
* **Deployment**: Deploy the MVP and final product in a controlled environment, followed by a phased rollout to additional markets.

**Test & Feedback Approach**

The test and feedback approach includes:

* **Pilot Implementation**: Start with a pilot implementation in one or two Vodafone markets to test the chatbot's functionality and gather feedback from testers.
* **Feedback Collection**: Collect feedback from the pilot implementation to refine and enhance the chatbot's features.
* **Iterative Improvement**: Continuously improve the chatbot based on user feedback, ensuring it meets testers' specific needs and addresses any challenges encountered during the pilot phase.
* **Comprehensive Training and Support**: Provide comprehensive training and support to testers in each market, including user manuals, training sessions, and ongoing technical support.

# 5.2 Project Performance

The key performance indicators (KPIs) for the prototype of the ***V-TRAIN***

1. **Efficiency Metrics**:
   * **Time Savings**: Measure the reduction in time taken to retrieve test data compared to the manual process.
   * **Data Retrieval Speed**: Track the average time taken by the chatbot to respond to user queries and provide relevant test data.
2. **User Satisfaction**:
   * **User Feedback**: Collect feedback from testers on the chatbot's usability, accuracy, and overall experience.
   * **Adoption Rate**: Monitor the number of testers using the chatbot and the frequency of usage.
3. **Data Accuracy and Integrity**:
   * **Data Relevance**: Evaluate the accuracy and relevance of the test data retrieved by the *V-TRAIN*.
   * **Data Integrity**: Ensure that the data reservation feature is functioning correctly, and that retrieved data is reserved for specific users.
4. **Operational Efficiency**:
   * **Cost Savings**: Calculate the cost savings achieved through reduced manual effort and improved efficiency.
   * **Resource Allocation**: Assess the impact of the *V-TRAIN* on resource allocation and the ability to focus on higher-value tasks.
5. **Scalability and Adaptability**:
   * **Market Rollout**: Track the successful rollout of the *V-TRAIN* across multiple Vodafone markets.
   * **Localization**: Measure the *V-TRAIN’s* ability to handle multiple languages and adapt to different market requirements.

By tracking these KPIs, the effectiveness and success of the prototype can be accurately measured, ensuring that the ***V-TRAIN*** delivers significant value to Vodafone.

# 5.3 Project Constraints

1. **Integration with Existing Systems**: The *V-TRAIN* must seamlessly integrate with existing systems and non-production environments, which may require considerable resources and effort.
2. **Data Management**: Efficiently managing and retrieving relevant test data from large datasets is crucial. The *V-TRAIN* must handle vast and varied data while maintaining data integrity and relevance.
3. **Natural Language Processing (NLP)**: The *V-TRAIN’s* NLP capabilities must be robust enough to understand and respond to user queries accurately in multiple languages.
4. **Real-Time Data Retrieval**: The *V-TRAIN* must provide instant access to relevant test data, ensuring that the data is up-to-date and accurate.
5. **Technical Issues:** There is a potential risk for bugs or technical issues that could disrupt the *V-TRAIN’s* operations, requiring ongoing maintenance and prompt resolution.
6. **User Adoption:** Ensuring that testers adopt and effectively use the *V-TRAIN* is critical. Resistance to change or lack of familiarity with the *V-TRAIN’s* features could impact its effectiveness.

By addressing these constraints, the prototype of the *V-TRAIN* can be developed and implemented successfully, ensuring it meets the needs of testers and aligns with Vodafone's strategic priorities.

# 5.4 Major Project Milestones / Timescales

Need to prepare info for this section

# Cost Benefit Analysis

# 6.1 Cost Summary

Here is the summary of the expected costs should the project be granted the opportunity to move forward.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Fin. Year / Phasing** | **FY25/26** | **FY26/27** | **FY27/28** | **FY28/29** | **FY29/30** | **TOTAL 5 YEAR** |
| CAPEX | € 422 K |  |  |  |  | **€ 422 K** |
| OPEX | € 174 K | € 174 K | € 174 K | € 174 K | € 174 K | **€ 870 K** |
| **TOTAL** | **€ 596 K** | **€ 174 K** | **€ 174 K** | **€ 174 K** | **€ 174 K** | **€ 1292 K** |

**Expenses of the prototype Solution: NIL**

Internal resources and existing Free / licensed software’s have been used.

* Development and Design:
  + - 3 Hour / Day for 20 Days in Development and Design.
    - 1 Hour/Day for 15 Days during Maintenance
* Infrastructure Used:
  + - LLM
    - UI
    - Backend

# 6.2 Full-Scale Solution

The Solution will be scaled using the following dimensions…

1. **Configurable Architecture**: The *V-TRAIN’s* architecture should be highly configurable, allowing it to be easily adapted to different markets with minimal configuration changes.
2. **Language and Localization**: The *V-TRAIN* should support multiple languages through natural language processing (NLP) capabilities, enabling it to understand and respond to user queries in the local language.
3. **Scalable Data Management**: The *V-TRAIN* should be designed to handle vast and varied datasets, efficiently managing and retrieving relevant test data from large datasets.
4. **Pilot Implementation**: Start with a pilot implementation in one or two stacks to test the *V-TRAIN’s* functionality and gather feedback from testers.
5. **Feedback and Iteration**: Collect feedback from the pilot implementation to refine and enhance the *V-TRAIN’s* features. Continuous improvement based on user feedback is essential for a successful rollout.
6. **Training and Support**: Provide comprehensive training and support to testers in each market, including user manuals, training sessions, and ongoing technical support.
7. **Gradual Expansion**: Roll out the *V-TRAIN* to additional Vodafone markets in a phased manner, allowing for careful monitoring and management of the implementation process.
8. **Monitoring and Maintenance**: Establish a robust monitoring and maintenance framework to ensure the chatbot operates smoothly across all markets. This includes regular updates, bug fixes, and performance optimization.

Complete Architecture diagram,

# 6.3 Cost Details

**Forecast of expenses for the scaled solution (1 Year View):**

Considering the various data sources, connectors and storage capacity being utilized, the following is approximate cost for the year

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Category** | **Type** | **Details** | **Per Month** | **Per Year** | **6 Monts Cost** | **1 Year Cost** |
| Infrastructure | OPEX (Internal) | AI-Booster Platform Cost | € 1,000.00 | € 12,000.00 |  | € 12,000.00 |
| Infrastructure | OPEX (External) | Connectors Cost for Tools like Slack etc. | € 1,000.00 | € 12,000.00 |  | € 12,000.00 |
| Infrastructure | OPEX (External) | Database Costs | € 1,000.00 | € 12,000.00 |  | € 12,000.00 |
| Design, Development and Testing | CAPEX | 1 Solution Architect | € 70,000.00 |  | € 420,000.00 | € 420,000.00 |
| 1 Senior Developer |
| 3 Software Developers |
| 3 Testers |
| Security Assessments | CAPEX |  |  | € 2,000.00 |  | € 2,000.00 |
| In-life and maintenance cost | OPEX (internal) | 2 full-time developers, including one senior | € 11,500.00 | € 138,000.00 |  | € 138,000.00 |

|  |  |
| --- | --- |
| **TOTAL** | **1 Year** |
| Estimated OPEX | **€ 174,000.00** |
| Estimated CAPEX (One Time) | **€ 422,000.00** |

# 6.4 Benefit Summary

***V-TRAIN*** is expected to bring the following benefits…

* Reduced testing timelines
* Increased testing productivity
* Increased accuracy & quality of testing