

A Survey on Knowledge Base: An Internal Platform to Exchange Technical Questions and Related Answers

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Abstract - This paper describes the development of a knowledge base which is an internal platform to exchange technical questions and related answers. Organizations can save a lot of time by answering queries on a sharable platform. Knowledge bases are said to be developed through the process of adding specialized application knowledge to documentation. By creating a reusable knowledge base, it extends the process of sharing knowledge in a single repository or system and enables quicker replies by anyone experienced in the field. Other than traditional methods like relying on personally sending messages and emails, questions and related answers can be answered on one platform.

Key Words: Knowledge base, React JS, Stack Overflow, User Interface, JavaScript

1. INTRODUCTION

Technological advancements will bring knowledge to more and more disparate locations. It is easy to lose track of information in emails, social media interactions, forum discussions, comments, tickets, and even in the minds of people. In a knowledge base, users can look up information about various products, services, departments, or topics on a self-serve website.

Knowledge bases can be populated with data from anywhere. They are usually expanded and enhanced by contributors with expertise in the relevant subjects. Essentially, knowledge bases are encyclopedias that have been extended. Access to accurate information is expected and demanded in today's connected world. Often, they are unwilling to call on the phone to do so, or send out emails or a service ticket. It is important to them that they receive an immediate response. You therefore require a broad, in-depth body of information, the knowledge base.

Knowledge bases are said to be developed through the process of adding specialized application knowledge to documentation. Inquiries with the same intent are mapped to the same response on a user-friendly platform, which aims to transform a variety of questions that customers may have into. Support members have the option of asking new queries or researching previously requested ones. If support personnel have had thorough training on a

module or if readily accessible documentation is available, the majority of client questions and problems can be resolved by them.

There are many advantages with knowledge bases which follow rules, they are listed below:

- Acquiring and maintaining: A developer need not maintain facts. The user can collect all the rules and acquire it themselves. Taking an example, when a user infers about a particular topic, he can use the knowledge base to clarify any doubts relating to that particular topic.
- User participation: Increases user participation and encourages more developers and support to ask and answer questions which automatically builds the knowledge base further.
- Justification: By detaching the knowledge, an engine which is used to infer can be constructed. This engine can get innovative and fresh results and strategies to the developers and support by allowing it to be stored in the knowledge base.

2. BACKGROUND

2.1 The Knowledge Base

Data can be got into the knowledge base from any website, one's own memory about a subject. As and when a developer keeps adding solutions to the users query, the knowledge base keeps automatically getting generated. Knowledge bases are said to be developed through the process of adding specialized application knowledge to documentation. The main purpose of this project is to create a platform where the support team and developers of an organization may share information. The goal is to provide a single platform for developers and the Tekion Support staff to ask and answer queries. It enables easy access to knowledge by looking up and solving doubts on one platform. It saves time by allowing engineers to answer inquiries on this platform rather than via email or Slack. The knowledge base includes explanation with reasoning as well as a major chunk of learning by one self. Developers and support can ask and answer questions on this platform as well as remember information that they

have forgotten by referring to the knowledge base. The methodology for implementing this project can be broadly divided into different tasks as follows

1. **Research & Understanding the current Knowledge Base Domain:** It is vitally necessary to comprehend contemporary technology. The first step is to understand the requirements of the users (developers and support).
2. **Designing a UI with the help of forms:** The required UI is made using a coding platform - Visual Studio code. The FormBuilder component is used for creating fields like subscribed tags, daily subscribed tags and weekly subscribed tags. These tags use an Async MultiSelect renderer to render the tags on the screen. Infinite scroller is used to render all the tags. The tags are deletable and the necessary CSS is used for styling. Form validators are used for all the fields. Features like "Ask Question" contain multiple ways through which developers can ask questions which include code blocks, tags, images, etc. The home page includes the newest and top questions asked. Questions can be commented on and bookmarked according to the user's requirement.
3. **Adding features to the form:** Features like Async MultiSelect, MultiSelectField, DropDownInputField renderers are used to render the components on the screen.
4. **Adding Notification:** To receive notifications, tags need to be subscribed to. Notifications are enabled every time a developer/support:
 - Answers a question - new answers and upvotes
 - Mentions someone in a comment
 - Comments on the question
 - The notifications are provided through emails or slackbots.
5. **Integration of all pages & testing:** After integrating all the APIs to the UI, all the pages of the application are integrated and run together. This is done using the history.pop() which allows you to go to the previous page accessed and history.push() function.

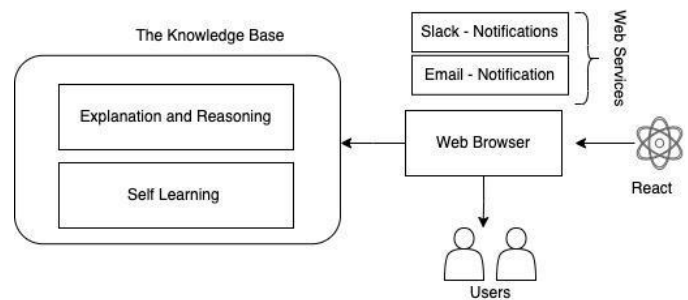


Fig -1: General structure of the Knowledge Base using ReactJS

2.2 The User Interface

The user interface enables the user to interact with the knowledge base. Through different pages designed in the application, the developer or support can post his queries, interact with and expand the knowledge base. Using React a UI can be made, which is easier to debug.

- **A landing page:** A landing page of the application to enter queries and display them in an organized fashion.
- **Asking a question page:** A detailed information entering page where the developer or support can ask questions in any form, like video, text, images, code block, etc.
- **Navigation:** buttons, checkboxes, radio groups should be provided in order to navigate through different pages and save changes accordingly.
- **Notifications:** Notifications can be sent in through emails which includes a daily and weekly digest and slack for organizations.

3. EXISTING MODELS

This section examines a variety of existing systems for the usage of the knowledge base in various fields and shows how they can make a significant difference

3.1 Ontology-based intelligent retrieval system for soil knowledge

The author in this paper [1] talks about how the internet has become extremely popular and everyone reaches out to it for retrieving information. He talks about how gathering and quick retrieval of information using ontology is an efficient and the latest way to search for things on the internet. Here, a knowledge base is built for agricultural chemistry which mainly focuses on helping the farmers know more about soil and get information about it easily. By building a user interface using XML and JSP, they have successfully built a knowledge base. As and when a user enters anything into the knowledge base, the

web page will give an informative and intellectual way of retrieving information. This system is also reusable for other applications and users.

3.2 A Knowledge-Based Approach for Detecting Misuses in RFID Systems

In this paper, the authors talk about whether it is possible to use ontology for the concept of vulnerability scanning in order to replicate RFID objects. Using a knowledge base for the RFID system, made it clearer and easier to understand all scenarios of replicating tags. This method is highly reliable and improves ease of work by updating the knowledge base. There was one issue discovered, which was the time taken for the response of the MDS but there was a positive response for overall execution of the MDS.

3.3 Present day web-development using ReactJS

This thesis [1] describes a comparative assessment of several applications built in different frameworks in order to get applications which work in a more efficient manner. This analyses has recently been used and has increased in usage of applications. Using the frameworks existing in Javascript, it helps in better usage, seamless integration and uses more efficient technologies to help the programmer. Usually in an organisation, it is up to the project lead as to which framework to use.

3.4 The Knowledge-Based Design of Educational Technology

In Present Day Web-Development using ReactJS [2] ReactJS is a part based library which is conveyed for the advancement of intelligent UIs. Presently it is the most famous front-end JS library. It consolidates the view (V) layer in M-V-C (Model View Controller) design. It is bolstered by Facebook, Instagram and a network of individual designers and associations. Respond fundamentally empowers advancement of enormous and complex online applications which can change its information without ensuing page revives. It focuses to furnish better client encounters and with blasting quick and powerful web applications advancement. ReactJS can likewise coordinate with other JavaScript components or structures in MVC, for example, AngularJS.

3.5 Current approaches to handling imperfect information in data and knowledge bases

Styling web applications using text weights, different colours, dimensions like height and width use cascading style sheets which basically are used to design and make web applications more appealing. In this paper [3] the author describes how to use cascading style sheets in react. We can write CSS using inline functions or as separate files. Using CSS Modules is very advantageous over normal CSS sheets. CSS can be implemented through many libraries in JavaScript.

3.6 Building a Knowledge Base on Research-Practice Partnerships: Introduction to the Special Topic Collection

This thesis [4] was aimed at learning more about JS based frontend for developing applications. There are multiple frameworks and packages available for the task of frontend development one of them being ReactJS. ReactJS was developed by Meta and is proven to be one of the best performing rendering libraries till date. The thesis also focuses on the view component of Model View Controller and how its used in application development of varied scales.

3.7 Stack Overflow – Informal learning and the global expansion of professional development and opportunities in programming

In the present age, there is a lot of backlash in the educational systems for not being a reliable source for teaching since learning and grasping information is not the most important foundation for teaching [6]. As an alternative, virtual technology has come to be a very effective way of promoting learning by using software that encourages students to grasp content in a more efficient manner. Since virtual learning has been on the rise since the pandemic hit, online and offline methods have been used to teach. This paper also includes figures and tables which show knowledge based learning which helps in better documentation.

3.8 How to ask for technical help? Evidence-based guidelines for writing questions on Stack Overflow

Stack Overflow has evolved to be a sensation among developers across the globe, with programmers from diverse backgrounds. Also the user base has increased with more coders coming from little to no experience. Stack Overflow provides a platform for new learners to post doubts in coding, and get quick and effective solutions to them. Also ways to optimize the programme can be learnt from the platform.

3.9 React – A JavaScript library for building user interfaces

Current techniques to dealing with faulty data in data and knowledge bases [8] examines strategies for representing and reasoning with faulty data. It begins with an attempt to categorise the various sorts of imperfection that may exist in data, followed by a discussion of the sources of such defects. The classification is then used as a framework for thinking about work expressly concerned with the representation of imperfect information, as well as related work on how flawed information might be utilised as a basis for reasoning. The work reviewed comes both from the field of databases and the domain of

artificial intelligence. Both of these fields have long been a concern with the challenges that arise as a result of faulty knowledge, and this paper emphasises the connections between the methodologies adopted in each.

4. CONCLUSION

The Knowledge Base is an internal application which establishes a peer-to-peer network of the developers and support staff. It helps in accessing answers to commonly arising technical questions such as installation barriers and unknown technical paradigms. It also provides an exposure to the user to approach the community seeking help by posting the questions in The Knowledge Base. The communication between peers which used to be one-to-one is brought to a single platform. This helps in reducing the friction in the communication and resolve the barriers for a smooth development process. Users can access the content present in The Knowledge Base by searching or subscribing tags and also contribute to the community by answering questions. The support staff can use The Knowledge Base to search through the problem statement and quickly access multiple solutions and guide the customers.

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