Open-source Project- TYPES OF DEVELOPMENT STACK

JATIN SINGH cs20M008@iittp.ac.in

Sridhar Chimalakonda ch@iittp.ac.in

A Eashaan Rao cs21d002@iittp.ac.in

ABSTRACT

Over the years, web development has become an indispensable element in the success of every industry. And, as you know, the web development world is continually changing, so its technology stacks are as well .

To make your business flourishing , it is essential that you follow the right web development technology. So, I have done a study on which development stack is mostly used.

KEYWORDS

MEAN_STACK : "MEAN JavaScript MongoDB Express AngularJS Node.js",

MERN_STACK : "MERN JavaScript MongoDB Express ReactJS Node.js",

DJANGO_STACK : "JavaScript Django Python MySQL",

LAMP_STACK : "LAMP JavaScript Linux Apache

MySQL PHP Perl Python",

RUBY_ON_RAILS : "JavaScript Rails Ruby PHP

MySQL"

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1 INTRODUCTION

Experts consider MEAN technology the best for web development due to its various benefits. It's comprised of MongoDB (a NoSQL DB), Express.js (a backend web framework), Angular (a front-end framework), and Node.js (an open-source cross-platform server), and can be used for developing complex mobile and responsive web applications.

The single language used throughout this stack is JavaScript. Its components are JSON savvy and excellent in data transmission with free module library access. This means web developers can reuse this code across the whole app without reinventing the wheel. Knowledge of JavaScript is sufficient to work with this web development technology stack. The stack also aids in developing fast, highly efficient, and scalable software applications.

MERN is nearly identical to MEAN with a bit of technological change, where Angular is exchanged with React. The main benefit of using MERN is the integration of React and its powerful library and capability to use code simultaneously on servers and browsers. Additionally, it has phenomenal full-stack development (front-end and backend) possibilities. React utilizes JavaScript XML and Virtual DOM, and these components work and implement changes seamlessly.

React is a popular framework known for its flexibility and performance-oriented approach,

enabling the building of top-end single-page apps with interactive interfaces. The MERN technology stack comes with an extensive suite of testing tools and is open source with community backing. It is the second most popular web technology stack of 2021.

LAMP is an old classic industry standard when it comes to time-tested web development stacks, which comprises MySQL (Relational Database Management), Linux (Operating System), PHP (Programming Language), and Apache (HTTP server). It is open-source and available for free.

The stack runs efficiently on all operating systems. In web development, it provides the website with the best performance, cost efficiency, and flexibility. Its components can be interchanged or modified within the same stack.

Today, the LAMP stack's simplicity, power, and stability have made it one of the preferred platforms for developing custom and advanced web apps for 2021.

Ruby on Rails (RoR) is a developer-friendly web development stack. It is open-source, object-oriented, and uses a dynamic programming language called Ruby. RoR facilitates the development of lightweight applications that increase flexibility.

The stack works in tandem with HTML, CSS, and JavaScript for creating interactive user interfaces, and XML or JSON for data transfer. It allows the use of default structures for web pages and database management. It also provides developers with a detailed error-log to build bug-free applications.

Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design.

Rapid development, Open source and Great community are the key factors why developers consider Django .

2 DATASETS

I have used the project from github repository. Firstly around 700 repositories were downloaded which were written on any programming language.i have used the python code to download the repository.

Secondly I have extracted description of the repository, languages used in the repository, Name of the repository and repo url of the repository and I stored all the data in same order in a json file named as data_scrap_url.json.

Thirdly , I have used spacy package "en_core_web_lg" model to calculate the similarity score of each development stack (mern stack , mean stack, django stack, lamp stack, ruby on rails) for every repository.

So in a json file named as predict_stack.json file I have stored repo_name of repository ,repo url of repository , similarity score for each development stack.

And after that i have made a bar graph of similarity score of development stack for each repository. After this we have calcuted the maximum similarity score in each repository and if that maximum similarity score is greater that 0.6 then the development stack associated with that maximum similarity score will be the development score for that particular repository. But if the maximum similarity score is less 0.6 then we say that for this repository we donot have any development stack.

After this I tried to find the most popular development stack for that I have counted the occurrence of each development stack in the whole repository and plot a bar graph based on the frequency of occurance of each development stack. And whichever development stack has maximum frequency that stack is the most popular development stack.

3 EXPERIMENTS IN THE EMPIRICAL STUDY

RQ1: How well does my stream downloaded the relevant project from repository?

I was able to download top 700 open source repository from the github.

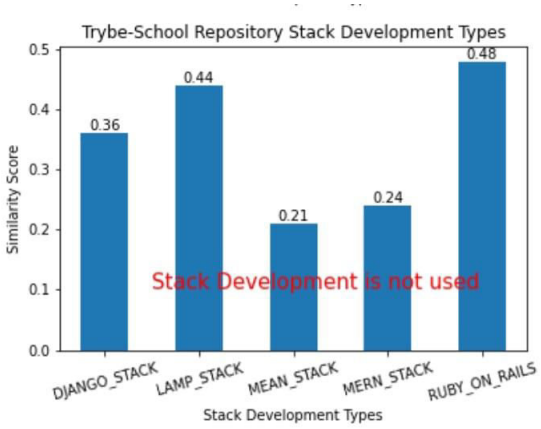
I have Extracted repository and its information such as description , languages used in the project , name of the project , repo url of the project. I have stored all the extracted data in a Jason file.

RQ2:how to predict the development stack used in a project ?

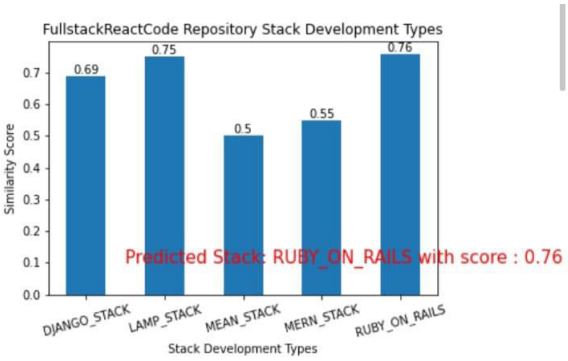
I have used a spacy model to calculate the similarity score for each development stack .After that I have stored the similarity score in a Jason file.

After this I have selected the development stack with max_similarity score as the predicted stack for the repository if the max_similarity score is greater than 0.6 if the max_similarity score is less than or equal to the 0.6 then we said that no development stack is used.

As we see in the below figure the repository according to our prediction has not used any development stack.

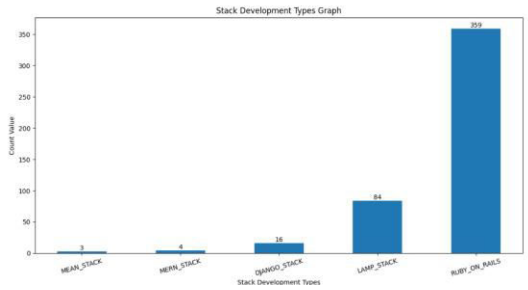


As we see in the below figure the repository according to our prediction has used ruby_on_rails development stack.



RQ3: Which is the most used development stack?

In this research question I have plot a bar graph of development stack used in the repository . As we find by our prediction that ruby_on_rails is the most used development stack.



4 RESULT

In first research question I am satisfied as I easily downloaded the relevant project from github repository.

In second I have predicted the development stack based on similarity score for each repository.we get development stack only if max similarity score is greater than 0.6.

In third research question I have calculated which is the most used stack among the five stacks we have taken based on our prediction.

5 LIMITATIONS OF THE STUDY

I have used already build model from a spacy package to compute similarity score, we can build our own model also.

we have taken less keywords to predict , if we will increase the keyword we will get more correct output

The work is fully oriented and based on GitHub repo and we have taken only few repositories for predicting our result , so apart from this lots of other open source form are available online so the better analysis and result will be come if we do the analysis through extracting the heterogenous open source data and using more keywords.

6 RELATED WORK

[1] Cloudboost.io,'MEAN and MERN

[2] Stackchief.com,'MEAN stack'

[3] Digi117.com,'Choosing the right stack'

7 CONCLUSION AND FUTURE WORK

In this in future we can build our own model to calculate similarity score .

We can add more development stacks like Meteor.js Stack , Flutter ,etc.

We can increase keywords for a stack in future.

8 ARTIFACTS

Github link for my emphirical study.

https://github.com/cs20m008/TYPE-OF-DEVELOPMENT-STACK/upload/main

9 REFRENCES

[1] Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, NODE Book by Vasan Subramanian

[2] Getting MEAN With Mongo, Express, Angular, and Node Book by Simon Holmes

[3] React: Up and Running: Building Web Applications, Book by Stoyan Stefanov

[4] Cloudboost.io,'MEAN and MERN' [Online]. Available: https://blog.cloudboost.io/mean-and-mern-stacks-eb4cee991390.