

Internship Report At Paxcom India Pvt. Ltd.

Project report submitted in partial fulfillment of the requirement for the degree of

Bachelor of Technology in
Computer Science and Engineering

By

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Under the supervision of

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to

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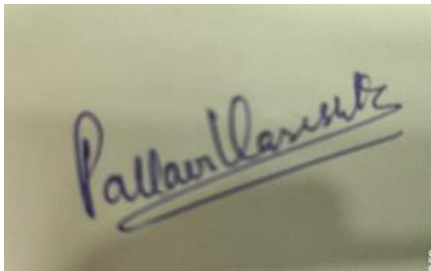
CERTIFICATE

(Student Sign)

Mohit Malhotra, 181309

I hereby declare that the presented report entitled "Internship report at Paxcom India Pvt Ltd" in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from February 2022 to May 2022 under the supervision of Mrs. Pallavi Vasishta. The matter embodied in the report has not been submitted for the award of any other degree or diploma.

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

A photograph of a handwritten signature in blue ink on a light-colored surface. The signature reads "Pallavi Vasishta" and is underlined.

Mrs. Pallavi Vasishta
Development Manager
Paxcom India Pvt. Ltd

ACKNOWLEDGEMENT

This report is not just a result of hard work by me but there has been a joint contribution by a lot of other people who I would like to thank. I am highly indebted to my manager Mrs. Pallavi Vasishta, for her continuous monitoring, providing details and her assistance in the completion of the training. I also want to thank my guide Dr. Ruchi Verma for her guidance without which this report would not have been completed. I want to express my appreciation for Mr. Pankaj Kumar, my parents and for Jaypee University of Information technology for their kind cooperation and assistance in the completion of the training.

I also thank and appreciate my mentor and colleagues for helping in completing the Internship and people who have voluntarily helped to understand the technologies.

ABSTRACT

The internship was focused on learning various aspects of backend development and chatbot development. During the course of my Internship with Paxcom I was able to learn many new technologies. I created various projects during my internship period.

The very first was a quiz tutorial for backend development where I developed a basic quiz application called QuizNow which has various functionalities like new user registration, login, logout. Through this application a user can take or give exam quizzes. Every user has a list of topics . Through this project I was able to learn Django framework, MongoDB as I used it for the database, and some basics of HTML, CSS and Javascript.

The second project was creating a Blog App. The application was a simple blog management app and is built using FastApi . Using the asgi server uvicorn I was able to create this app. The app is able to list,edit and add more blogs .

The third project was replicating the QuizNow project using the runtime environment nodejs.I used Express for creating server-side web applications faster and smarter.

I also learnt deployment of projects on docker and git. The report contains details of my learning during these 12 weeks of internship.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

I got placed at Paxcom India Pvt. Ltd. and carried out my 12 weeks of mandatory internship in the company. I was put in Mrs. Pallavi Vasistha's team. This is basically the chatbot team comprising of software engineers for backend and frontend, business analyst, Quality Assurance and full stack developers. My title during the course of internship was of Software Engineer- Trainee. I was mainly responsible for model training and backend development. The team organizes scrum calls regularly to discuss various blockers. The functioning of team is very smooth due to the core values followed and is also highly productive. We have good number of projects which are operational simultaneously and the outcomes are really impressive.

1.2 ABOUT COMPANY

Paxcom has the trust of some of the world's major brands and distributors, such as Britannia, Wipro, Mondelez and Pepsico, among others. In addition, Paxcom offers e-commerce solutions for product sales on India's biggest ecommerce sites like amazon, lazada, flipkart, etc. We serve a huge range of options including product intelligence, business intelligence and audit and compliance. We assist customers with data-driven decisions on pricing, advertising strategy, positioning, and other aspects of a product. Since 2019, Paxcom has been a member of the Paymentus Corporation. Paymentus, headquartered in North America, is a leading provider of e-billing and payment solutions. Paymentus enables customers to make real-time payments to businesses through any payment channel. It offers consumers a full and comprehensive payment suite, including premier collaborations such as Amazon Pay, PayPal, and Walmart.

Paxcom makes it easier for both brand owners and dealers to simplify day-to-day operations by focusing on optimizing the market, item content/perceivability, and limited-time methodologies of data-driven examination and bits of knowledge.

Paxcom's goal is to be your trusted team with a diverse range of abilities – your analysis consultant, product expert, advancement administrator, web-based industry researcher, data analyst, and expert specialist.

The organization's mission is to provide beneficial interactions to our customers that will allow them to track their competitors, screen their products, advance their content through

commercial centers, increase perceivability, and promote their offers, among other things. Paxcom was acquired by the Paymentus group a few years back, and the company's name was changed from "Paxcom" to "Paxcom India - A Paymentus Company."

Paymentus was established in 2004 as a result of a desire to change the way people pay their bills. Paymentus has grown from a vision to becoming the leading paperless electronic billing and installment arrangement available, with over 1,500 customers including some of North America's largest billers.

Paymentus consistently strives to grow stronger, faster, increasingly safer, cost-effective charging and installment phase and is identified by Deloitte as one of the fastest growing North American entities in 2011, 2013, 2014, and 2016. We are constantly on the lookout for more value for our customers, both in terms of contracts and management.

1.3 CORE VALUES

There are 3 main core values which helps identify what Paxcom actually is. These are the pillars on which we employees stand on. The huge increase in number of clients has been made possible due to these values - Integrity, Fun and Ownership.

Integrity - this is one of the most important values that employees at Paxcom possess as a person with integrity draws others to them and helps identify one as dependable and trustworthy.

Fun - this is depicted in the Paxcom work culture. We believe in hard work and fun. Events take place from time to time in which all the employees participate with enthusiasm. This helps in increasing the productivity and creates a better work environment for everyone.

Ownership - Every employee is responsible for his/her success and failure. Ideas are openly welcomed. Company culture discourages use of Sir/Madam within the office.

1.4 EXPERIENCE

I started my internship with Paxcom India Pvt. Ltd. on 7th February, 2022. I am posted at the Mohali office but due to the current pandemic we are following work from home. I joined the Chatbot team and was successfully able to understand the work pattern and structure. I was given multiple technologies to explore and learn during my internship like Python, Django framework, Git/Github, NoSQL based database like MongoDB, Nodejs, Express, FastAPI project development life cycle and softwares used for implementing the methodologies. I was also provided with multiple projects to understand the project structure and also have idea about its flow. I also got to learn soft skills like working in a team, communication within a

corporate firm. Because of this training I was able to understand about some of company's products.

CHAPTER 2

LITERATURE SURVERY

During my internship at Paxcom I learnt about various technologies like Python, Django Framework, FastAPI, MongoDB, Github. I also learnt about deployment services like docker. Also i learnt about agile methodologies of software development.

Python

Python is a high-level, object-oriented language for dynamic semanticization of our programming. Its high-level integrated data structures and dynamic typing and dynamic linking are highly appealing to the rapid development of applications as well as for use as a scripting and glue language for connecting existing components. The simple, easy to learn syntax of Python emphasizes readability and reduces the maintenance costs of the software. Python promotes modules and packages that facilitate the modularity of the programme and the reuse of code. The Python Interpreter and comprehensive standard library can be freely distributed on any major platform in source or binary form, free of charge. Often because of its improved productivity programmers are in love with Python. The edit-test-debug cycle is amazingly quick, because no compilation stage is possible.

The benefits that Python is ideally suited for AI and AI companies include performance and consistency. Appropriate adaptation, Platform Independence and a global network that contributes to the overall prestige of the language. Some of the libraries I learnt about in python include numpy, pandas, os.

FastAPI

Fast API is basically a high speed and modern web development framework which is used for building Application Programming Interface or APIs and is compatible with Python 3.6+. It is one of the fastest python frameworks available. FastAPI reduces approximately 40% of the errors which are caused by developers. It is highly intuitive as it has got great support for the editor. Everywhere completion. Debugging takes a lot less time. It is simple, very easy to use and understand. Docs are very easy in reading . FastAPI is brief as it reduce duplication of code. Every parameter declaration contains several characteristics, bugs are very less. It is sturdy and we get code ready for production. We get a interactive documentation automatically without any external efforts. It is based on open-standards for the APIs. A lot of people have been these days. Some of the biggest examples include Netflix's crisis management system, Microsoft, etc. Some topics I learnt in FastAPI are - Path Parameters,

Query Parameters, Request Body, Query Parameters and String Validations, Path, Parameters and Numeric Validations, Body - Multiple Parameters, Body - Fields, Body - Nested Models, Schema Extra - Example, Extra Data Types ,Cookie Parameters, Header Parameters, Response Model, Extra Models, Response Status Code, Form Data, Request Files, Request Forms and Files, Handling Errors, Path Operation Configuration, JSON Compatible Encoder, Body - Updates.

Django Framework

Django is a high level Python web development system that promotes rapid development and clean, practical design. Built by seasoned designers, it deals with a great deal of web development problems, so we can concentrate on writing our app without reinventing the entire design. It's transparent and secure. Django has been developed to allow developers to complete applications as soon as possible from the idea to the end. Django seriously takes protection and helps developers avoid making a lot of mistakes. Some of the most busy websites on the Internet use the power of Django to scale fast and flexibly.

In django I studied about how to build a project and how to create a app. Also I studied about different type of files - manage.py, settings.py, views.py, apps.py, urls.py, models.py, forms.py.

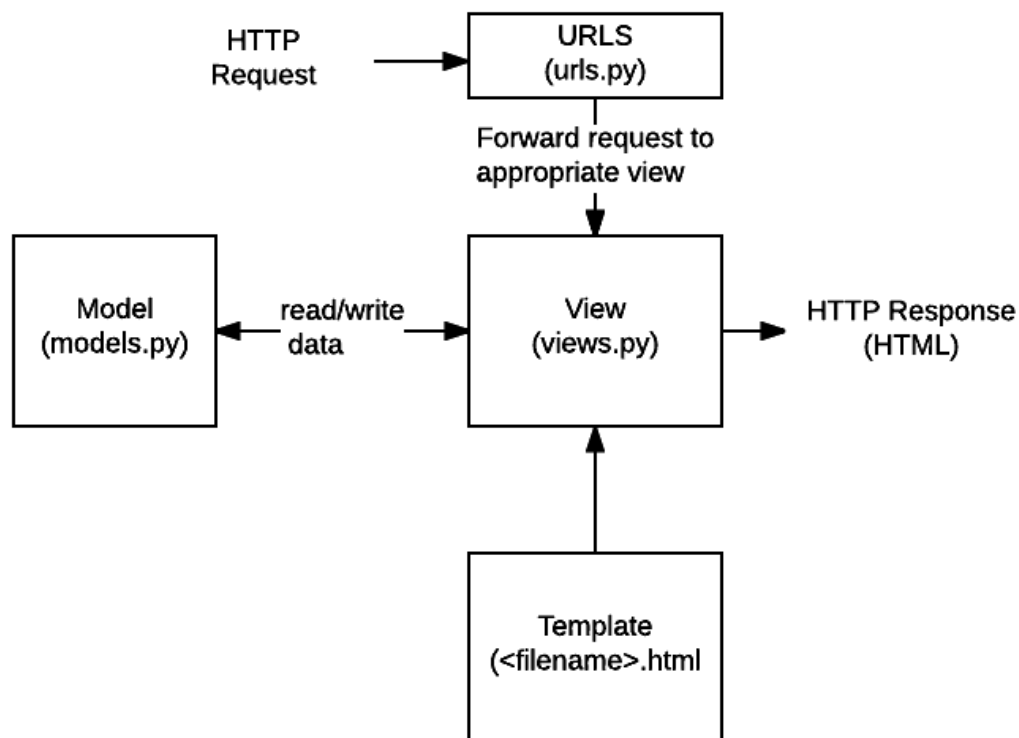


Figure 2 1 Django project architecture

MongoDB

MongoDB is a object based database. It is a NoSQL based database. It stores the data in JSON like format. This format is now one of the most used format for data transfer. MongoDB is a document-oriented, high performing, cross-platform, scalable database. It works on the concept of records and collections. Collection is a group of documents. It will exist in a singleton record. They do not implement any schema.

Documents which are inside our collection can have different fields. But generally the documents inside of a collection are used for storing same kind of data from a source. Any document is like a dictionary in python with key-value pair. MongoDB is better then the conventional row column model in many use cases. Use of such records has its own advantages: In several programming languages, documents (ie objects) match native data types. The embedded documents and arrays eliminate high cost joins. Fluent polymorphism is supported by dynamic schema.

In mongoDB my main focus was on creating a database, adding and dropping a collection, basic insert, query, update and delete operations. I also familiarized myself with the aggregation pipeline and how to use it. I also came across projections and sharding.

Compass is a MongoDB graphics interface. Enables users without previous knowledge of MongoDB query syntax to explore the quality of their stored data. If we explore data in the visual world, Compass GUI can be used to maximize results, manage indexes and apply document validation. The complete MongoDB Compass version is available. It contains all of MongoDB's features and features.

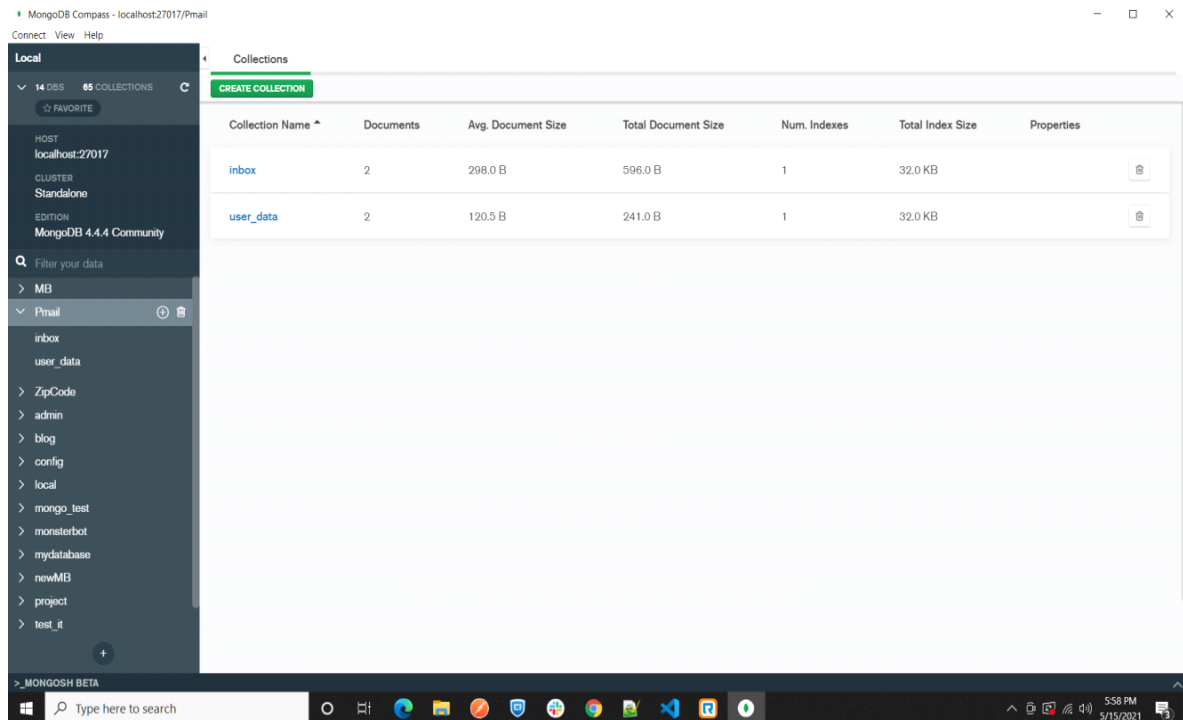


Figure 2.2 MongoDB stores data in the form of collections

Git/Github

Git is a version control system or we can say VCS. Git lets us handle our project and the primary reason to use it is to keep track of the history of items that we have worked upon. During creation of a project it is easy to make errors or work on introducing a new feature into the app without disturbing the stable application or one wants to introduce a new version of the application. Here is where git comes into play. Git offers us features like branching, merging, rollback, etc which are very useful when working for a large scale project. Git also helps people to work together on a single project without disturbing each other's files. Working together as a team with Git is all the simpler. Team members can work on various features and combine modifications quickly

GitHub is nothing but a remote storage for repositories. Repositories act as a storage for our application code. It is the best place to share our application code with friends, teammates, and even unknown developers around the globe. Over 31M people currently use GitHub to build awesome applications across 97M + repositories. There are numerous open source projects available on github with enormous community of developers contributing towards different projects. One such big project is the Android project which google made public and is now getting contributions from a large number of developers.

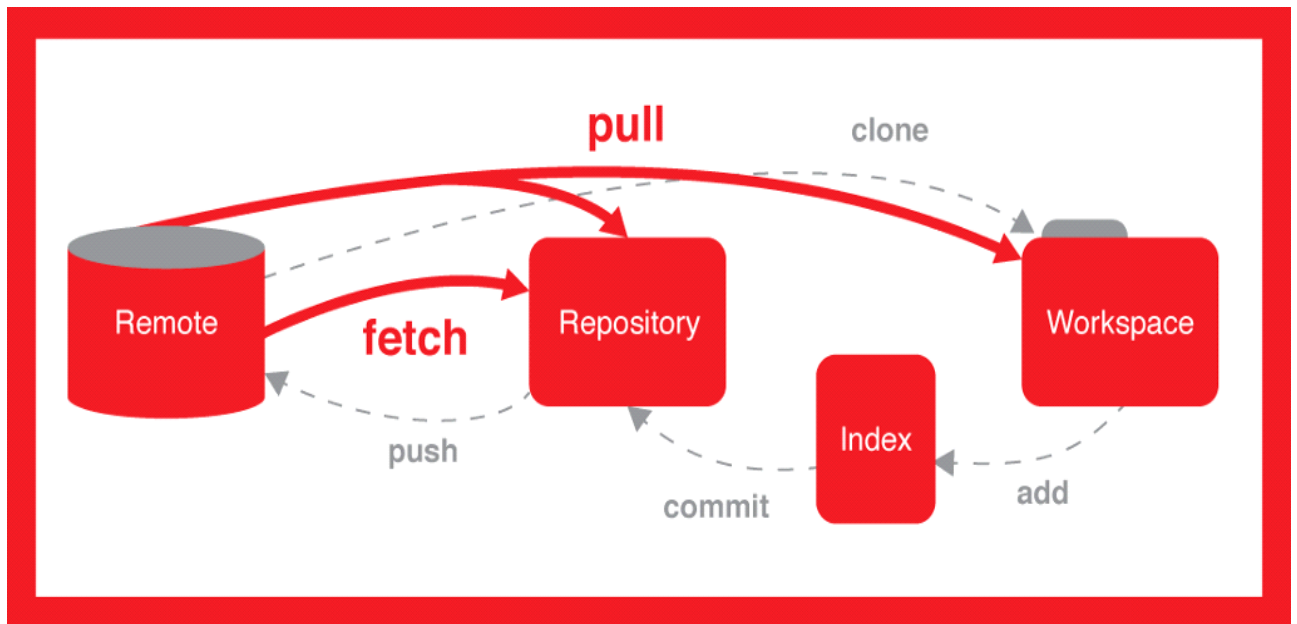


Figure 2 3 Git and github architecture

In git and github my major focus was to learn git clone, commit, branching, log, pull, fetch, merge, rebase and squashing commits and cherry-pick.

Docker

Docker is a containerization platform that is available as an open source project. It allows programmers to bundle programmes into containers, which are standardised executable components that combine application source code with the operating system (OS) libraries and dependencies needed to run the code in any context. Containers have grown in popularity as enterprises move to cloud-native development and hybrid multicloud settings, making it easier to provide distributed applications.

Docker Architecture

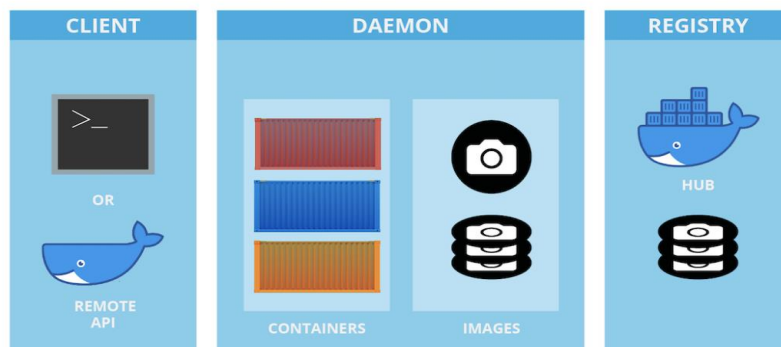


Figure 2 4 Docker Architecture and Workflow[1]

JSON

Python has an integrated package called `json` that can be used for JSON data activity. JSON has quickly become the de facto standard for data sharing since it was first created. We can collect information through an API or store your information in a document database. JavaScript Object Notation is a complete version of JSON. This means, for saving and transmitting the details, a script. The built-in package known as `json` is provided by Python. We import the `json` package into the Python script in order to use this function. The text in JSON is done via cited string containing value in the mapping of key values in dictionaries. It's like the Python dictionary. JSON displays an API that is like standard library users and Python supports JSON functions in a native context.

Serialization is the process of encoding JSON. This term means that data are converted into a set of bytes that are to be saved or transmitted through a network. The JSON library in Python uses a `dump()` feature to control the flow of data in a file, so that the Python objects can easily be translated to their respective JSON objects.

The deserialisation is contrary to serialisation, that is the conversion into their respective Python objects of JSON objects. This is using the `load()` form. If you use Json data from another programme or have it retrieved by Json string format, then `load()` may easily be used to deserialize it, otherwise the root object is in a list or dict.

CHAPTER 3

SYSTEM DEVELOPMENT

I created majorly 2 projects during my internship one is a Quiz web app called QuizNow and a Blog web app . I deployed both the projects on docker . The quiz website is built on Django framework as well as Nodejs and Express and used MongoDB as storage.

3.1 Blog Project

In this project, i was required to make a blog management system. Generally the big scale blog projects have many functionalities but in my project I created only a subset of them. Functionalities included new user registration, login system with proper jwt authentication. Once a user is logged in he can see all the blogs he has posted till now. The user can then perform all the CRUD operations on his blog posts.

Tools and technologies used for creating this project were:

- 1) Backend-- FastAPI
- 2) Database-- MongoDB
- 3) Frontend-- Html, Css and Javascript
- 4) Web Server -- Uvicorn(ASGI)

BACKEND:

It's a huge deal to choose a platform for web creation. There are several industry frameworks, each structured to meet particular project requirements. One of the most quick to gain popularity is the FastAPI framework. The reason and key features which makes it a quick to rise framework are:

- 1) Fast: As the name fastapi suggests this framework provides very high performance which is on par with Nodejs and Go.
- 2) Fast to code: Increase the speed to develop features by about 200% to 300%.
- 3) Fewer bugs: Reduce about 40% of human (developer) induced errors. *
- 4) Intuitive: Great editor support. Completion everywhere. Less time debugging.
- 5) Easy: Designed to be easy to use and learn. Less time reading docs.
- 6) Short: Minimize code duplication. Multiple features from each parameter declaration. Fewer bugs.
- 7) Robust: Get production-ready code. With automatic interactive documentation.
- 8) Standards-based: Based on (and fully compatible with) the open standards for APIs: OpenAPI (previously known as Swagger) and JSON Schema.

FastAPI provides in-built support for testing your apis which works fantastically and nullifies the need for third-party testing api softwares such as postman. This is built over swagger docs.

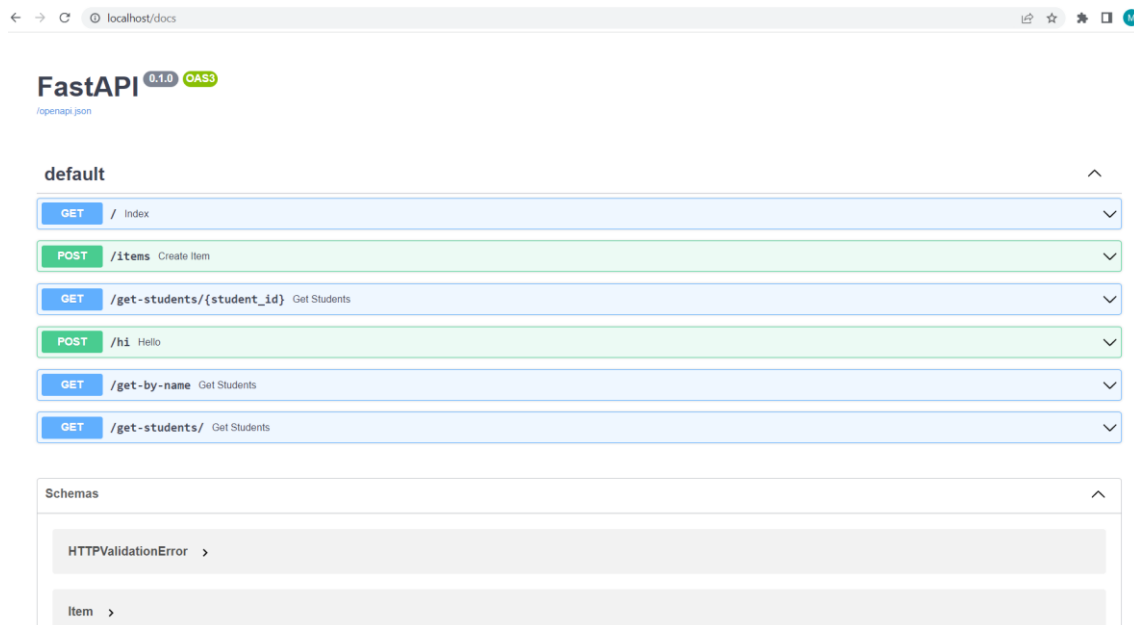


Figure 3 1 Swagger Docs

Since FastAPI supports asynchronous behaviour that's why to take its full advantage we used a web server uvicorn.

Uvicorn is an ASGI (async server gateway interface) compatible web server. It's (simplified) the binding element that handles the web connections from the browser or api client and then allows FastAPI to serve the actual request.

Uvicorn listens on a socket, receives the connection, does a bit processing and hands the request over to FastAPI, according to the ASGI interface.

FRONTEND

HTML, CSS and Javascript are being used in the email project. There are also various languages in the front-end stack. Although these differ from application to application, all web browsers understand only a few common languages. The HTML, CSS and JavaScript are the top three code languages. These are used together to create the primary structure which can then be rendered using any web browser. A browser uses a v8 engine to compile the javascript. These are the three main languages which make all other libraries and front end engineering comprehensive and necessary for any front-end developer.

HTML acts as the basic website layer that provides a 2D skeletal code on a website. This exists for both CSS and Javascript which are used for designing and functionality. HTML stands for Hypertext Markup Language. The most critical thing to note is the word markup, since markups are the proper name for HTML items, also known as HTML tags. HTML in its entirety is the markup that produces the essential items on a website.

A recent styling pattern is to use a pre-processor. This includes SaaS, designers and Less. Pre-processors script languages which are very common for browser compilation to CSS as the development process is expedited. Some programming logic can be adapted.

JavaScript is a web browser execution language. This means the website loads the usual basic JavaScript for a website and any additional JavaScript placed to a page when you open a web page. Parallel to it is loaded by the latest JavaScript, which will take action and decide.

In JavaScript, the back-end languages like Java or Ruby vary, because it is transparent and is not compiled in advance for the curtain to run secretly. It is true front-end engineering programming language and the fundamental language that connects it all.

DATABASE

Most people switch to MongoDB, but many also tend to use a conventional relationship database. This is why it has multiple explanations for using MongoDB as a NoSQL database. This led to the foundation of MongoDB's global fame. Some of the many features offered by MongoDB include -Aggregation Framework, BSON Format, Sharding, Ad-hoc Query, Capped Collection, Indexing, File Storage, Replication, MongoDB Management Service (MMS).

NoSQL is also known as "Not just SQL." NoSQL enables unstructuring, less data scheme in various collections and nodes to be stored, and has no set table sequences, minimal link queries and a horizontal scale. It has not been specified in many NoSQL databases, because no two NoSQL databases are equivalent. Thus, it has been defined that there are not many defined criteria for both Open Source and Open Source bases. No Stored MongoDB procedures The NoSQL data bases can work in a way that relational databases cannot to prevent the database from being a system-wide bottleneck, in particular in high volume environment

- Save high data volumes without structure
- Use of cloud and storage computing
- Fast evolution.

PyMongo has been used for database connectivity in this project. The procedure on the database is carried out by each module within PyMongo. Generally speaking, PyMongo

offers a rich range of methods to interact with a MongoDB node. It offers querying, finding results, writing and removal of records, and executing database commands. You need a MongoClient instance to construct a link to a database. This class offers an instance or server client for MongoDB. Per client object has an integrated communication pool that uses up to 100 server links by design.

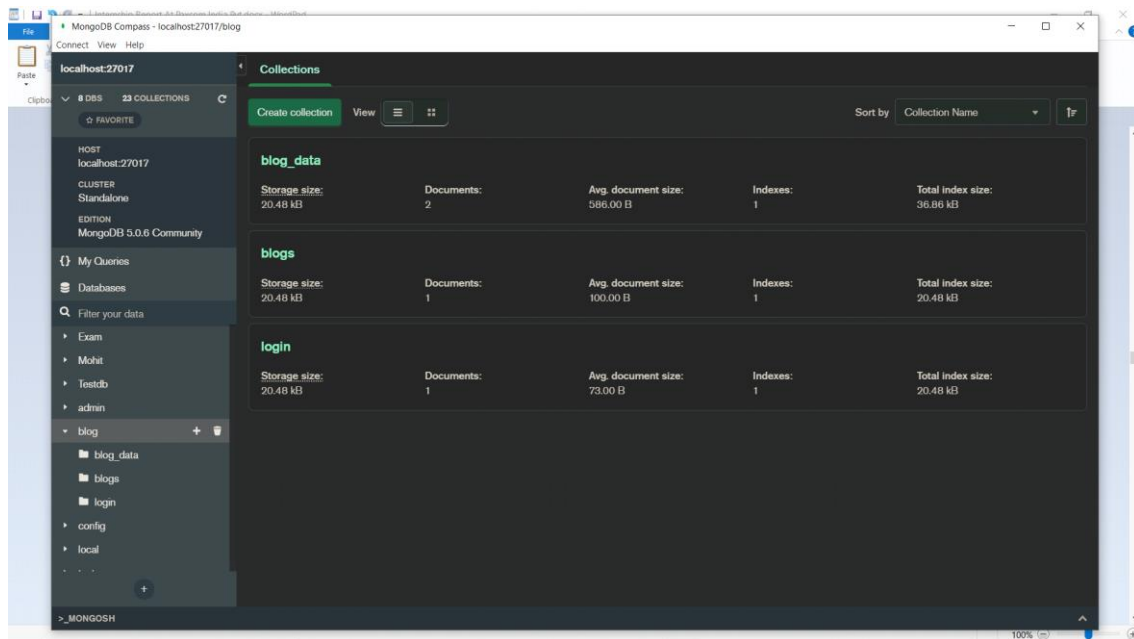


Figure 3 2 Blog Database

3.3 QUIZ APPLICATION

A quiz web application that helps us take and give tests. My quiz application is named "QuizNow". Currently I have implemented a subset of functionalities like register for new user and login functionality for existing users. I have used Jwt tokens for authentication.

Some of the tools I have used for the implementation of this application are:

- Django - for backend
- MongoDB - for database
- HTML, CSS and Javascript - for frontend

BACKEND

It's a huge deal to choose a platform for web creation. There are several industry frameworks, each structured to meet particular project requirements. The Django platform, one of the most common Web Development Frameworks for many businesses and independent projects, is an obvious option.

Django is a backend development open-source architecture built on Python — one of the top web development frameworks. Simplicity, versatility, efficiency and scalability are its key objectives. In all functions and modules Django has its own naming scheme like we generally put our HTTPResponses in a file named as views.py. It also has a admin panel and other technical features which is considered to be simpler to deal with:

- In-built ORM or object relation mapper
- Follows a MVC architecture.
- we have in-built http libraries
- We have middleware support
- unit test functionalities
- has its own server

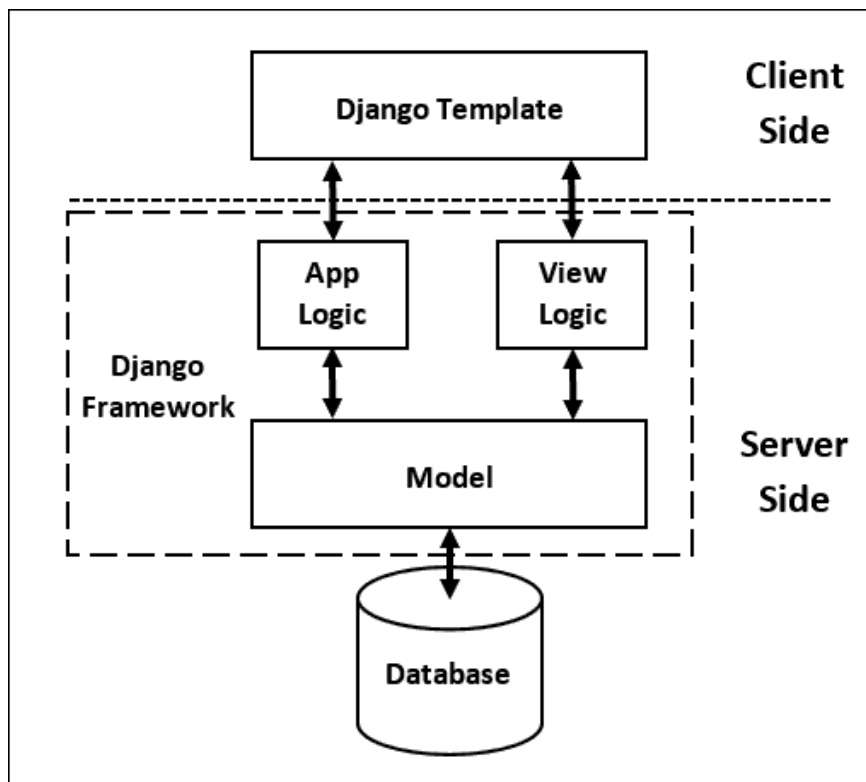


Figure 3 3 Django Architecture[2]

The accelerated development rules that suggest that developers should perform more than one version at a time without beginning the whole schedule from scratch. For Django, safety is

also high on the agenda. It has one of the best safety mechanisms out of the box out there and lets developers prevent problems with popular protection. We can tackle any tasks in Django, be it a small website or a high-load web application, of any scale and capability.

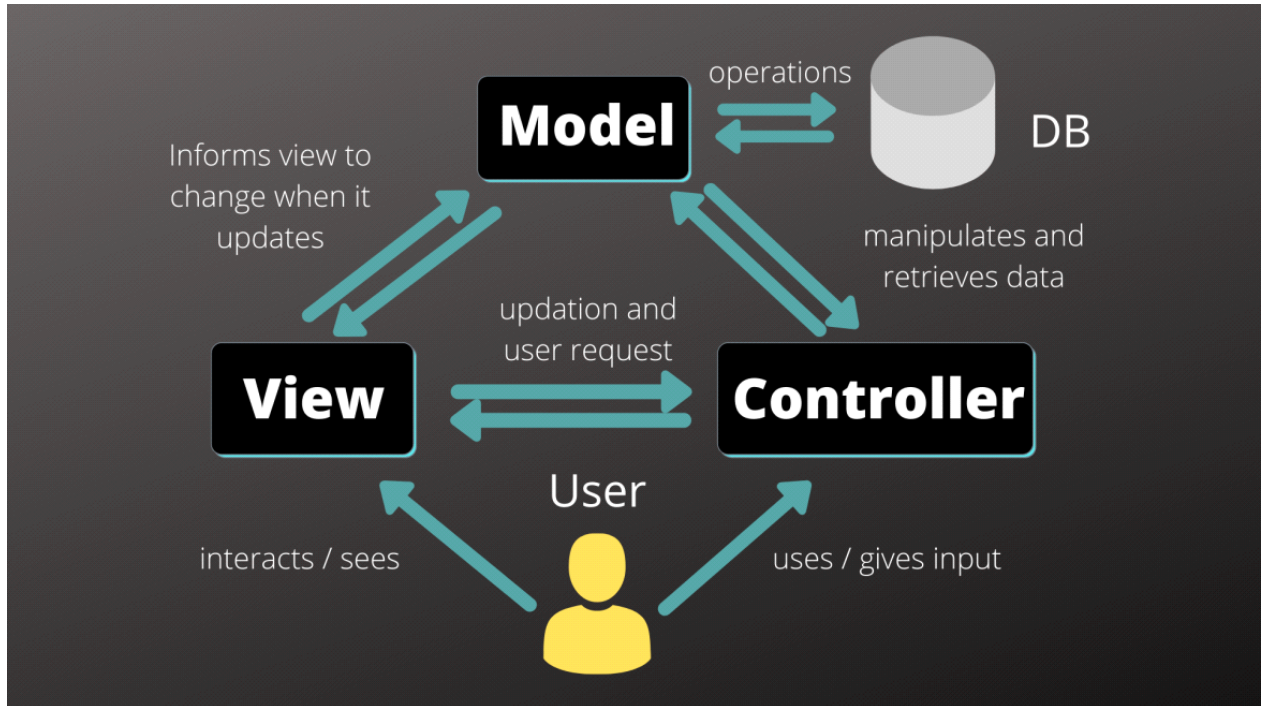


Figure 3 4 Model View Controller Architecture[3]

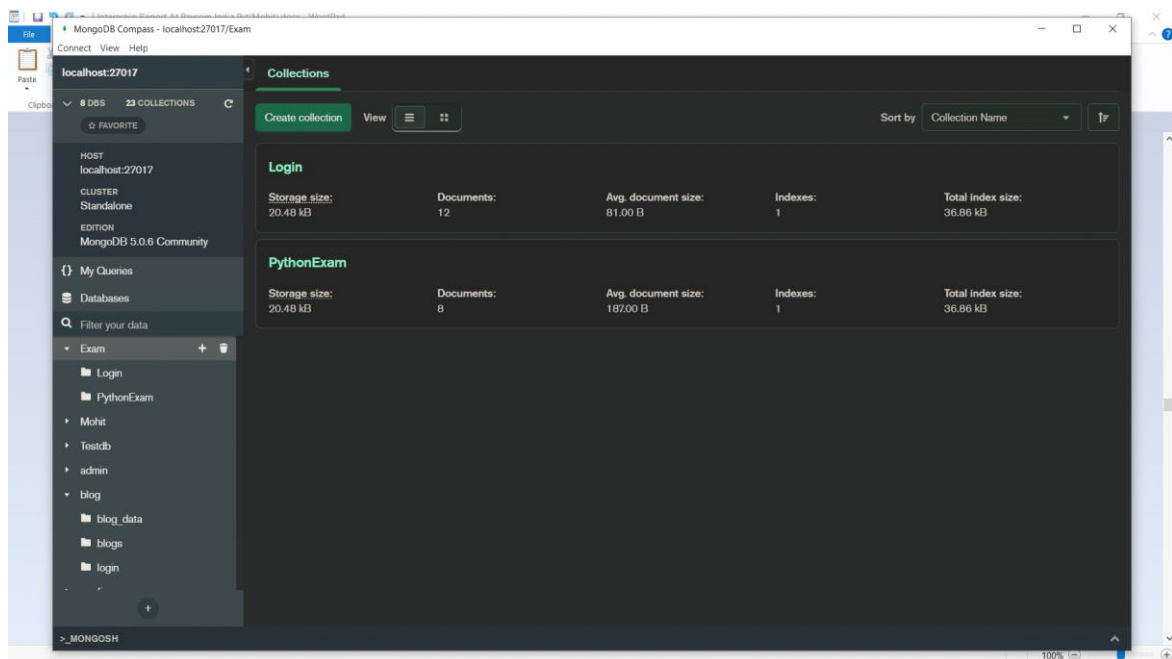


Figure 3 5 User login collection

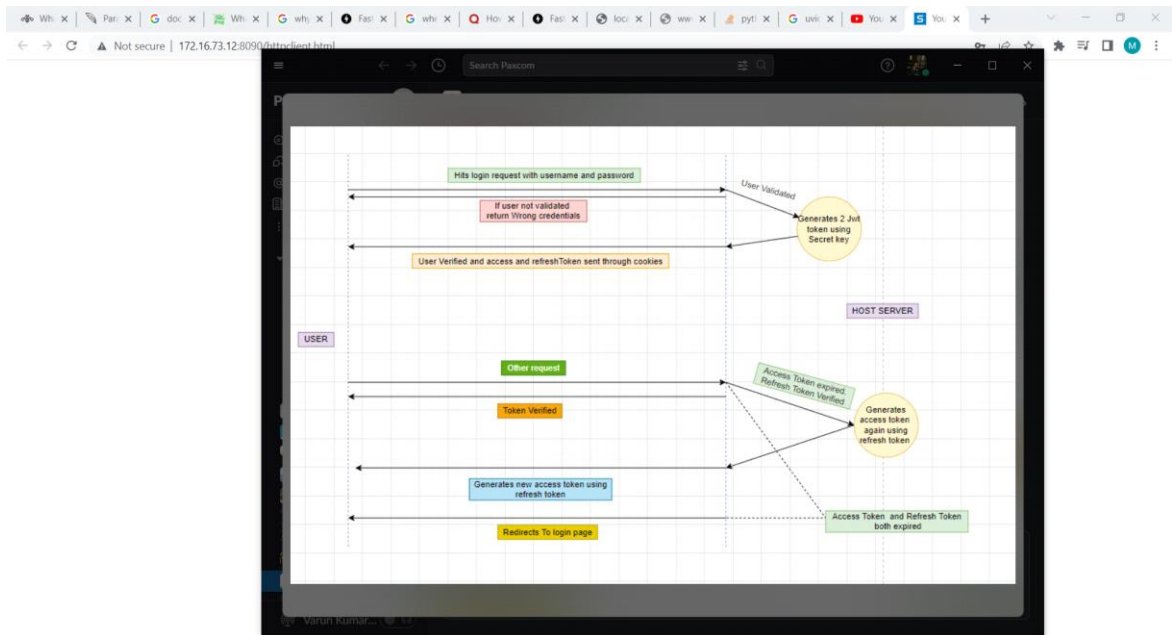


Figure 3 6 Use Case diagram

3.4 SOFTWARE REQUIREMENT

We do not require so many dependencies to run these projects. However some of the important ones are listed below:

- Windows 7+
- Python 3.x
- Django==3.2
- django-crispy-forms==1.11.2
- pymongo==3.11.3
- requests==2.25.1

3.4 DEVELOPMENT METHODOLOGY

The project uses agile development methodologies. Agile development of applications goes beyond systems like Scrum, Feature driven Development, extreme programming, tradition of pairs, test based development, stand-ups, sessions of preparation and sprints. Agile is capable of creating and reacting to transition. It is a way to address an unstable and chaotic world and eventually excel. Agile software development is a key concept for a series of processes and methods focused on the ideals and concepts of the Agile Development Manifesto and its 12 principles.

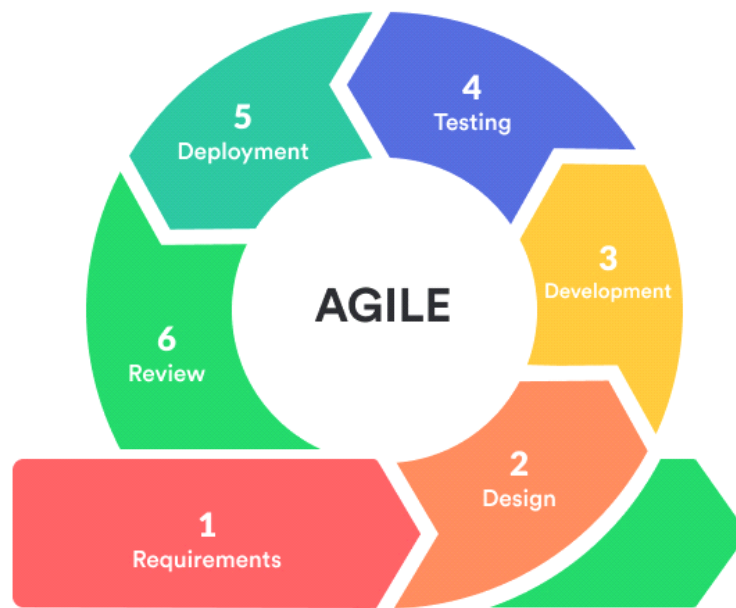


Figure 3 7 Agile development process flowchart[4]

The agile model is an incremental distribution technique, where every incremental component supplied is generated after every time box by an iteration. The Agile model's principal concept is resilience by the removal of repetitive tasks that lose time and effort.

For any iteration the finish date cannot be changed. In order to finish this version on schedule, the developing team would maybe have to reduce the delivered features.

There are numerous modules like Incremental Model of development which can be progressively built and delivered that separate program specifications. The main features are first developed and the program is developed in subsequent iterations with the addition of new features. Also we do not have any preset time for the next model.

Four key principles are highlighted in the agile software growth.

- Interactions between individuals and teams of processes and instruments
- Extensive documents working tools
- Customer cooperation in the negotiation of agreements
- In response to changes to a timetable

CHAPTER 4

PERFORMANCE ANALYSIS

4.1 FRAMEWORK PERFORMANCE ANALYSIS

DJANGO VS FASTAPI

As we know, Django is a mega framework for building web applications, whereas FastAPI is a minimalistic framework based on Starlette and Pydantic for building fast web applications using async IO.

Django is a pretty old language that came into existence in the year 2005, whereas FastAPI is a much newer language that came into existence in the year 2018 and only supports Python 3.6+ versions. Because of this, Django has a bigger support community as compared to FastAPI. So, you can get help quite easily whenever you are stuck in Django, but you may struggle a little in FastAPI.

Performance: FastAPI, being a minimalistic framework, is lightweight as compared to Django and hence offers very high performance, whereas Django is not as fast as compared to FastAPI, which is a micro framework.

Learning curve: FastAPI is very easy to learn and is helpful for those who are new to web development. Whereas Django can be a little tough for newbies but it has many courses, tutorials, and much more online, so it makes life easier for beginners in the web development field.

Flexibility: FastAPI doesn't constrain a developer to a certain code layout, hence it gives a sense of freedom while coding. But Django doesn't work like this framework. It expects the coding standard to be maintained and things to be done in a certain way.

Documentation: Django provides very good documentation support, but it is not interactive whereas FastAPI provides very interactive documentation.

Django is a full-fledged web framework that provides enormous power under the hood. But it is a little complicated for a beginner web developer and may cause some trouble. Whereas FastAPI is a very simple, light, and easy-to-use micro-framework, giving you just what you need. So, Django is very robust, whereas FastAPI is easy to use.

DJANGO VS NODEJS

Django gives better performance, owing to a built-in house template system promoting the execution of a vital task promptly. Django lacks mainly in the execution of asynchronous code because its asgi server which is required for handling async requests is comparatively new.

NodeJS performance is also good, as it permits web professionals with more liberty when it comes to implementations. But this inflates the overall development time needed to produce an application. However, here the concurrency of request execution is much better than Django. Also javascript being faster than python and since these both frameworks are based on these, nodejs wins the race against django.

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

After looking at them throughly, you might be able to choose which one works best for you. In summary, Django is perfect if you want to build robust full-stack websites because it has several functionalities and works very well in production.

Due to its proficiencies to make both, frontend and backend parts of an app, by one programming language – JavaScript, NodeJS is one of the most opted technologies for web application development.

At the same time, FastAPI is perfect if you're looking for speed or scalability. It is always wise to choose a framework based on what you want to use it for, but generally, they are all good and have a good market demand.

5.2 FUTURE SCOPE

Being in the chatbot team,I have to learn and use chatbot flow and its further scope. Artificial intelligence is the main discussion point for business clients who wish to enhance efficiency, implement new concepts, and take the next steps in the transition towards a digital organisation. AI and chatbots are promoting democratisation, creating new alliances and start-ups, and this needs to be prepared for any organisation.

Each company is a technology firm that was just one of the mantras of the decade. Each organisation has begun working and contact with smartphones in every vertically and sector, using cloud platforms to open its data and adopting as one-service solutions for reducing business costs and expanding its business base and employee opportunities.

Ten years ago, experts in maintaining databases and designing websites were required. Now someone with a plan can create a whole business out of the shelf, sell around the world without leaving their desk.

Chatbots are now even used in health sectors. Given that the need for mental health resources is often greater than what is available people in need can contact chatbots online on mental health. Mind chatbots assist service users, engaging them with interaction even when they feel vulnerable. In other situations there is a human aspect. Some chatbots are passive and respond only when they reach out to users. Other users who are on their site or have

downloaded an app will actively communicate with them. So to check with users, they will start talking.

Chatbots for mental wellbeing might only make a friendly ear. A place to address problems, fears, distracting feelings, or "therapeutic" discussions. You can use this feedback to detect the user's mood and respond empathically.

Some chatbots can aid users questioning their negative thoughts with advice or guidance.

Psychological wellbeing bots are widely used to treat people who show symptoms of diabetes or some kind of medical anxiety.

While these conditions are not specifically treated by the bots, they may still provide help to relieve them up till a certain . Chatbot technology is growing in general, there has been a huge demand. Some people even freelance and build and sell bots to companies based on their specific use case. With chatbots moving into customer service work, they become increasingly accustomed to communicating with them.

Via machine learning and language processing chatbots are now smarter and more able to communicate with us. People are inevitably searching for new methods of using them. Bots are growing with the increasing knowledge of mental health. More people are searching for mental well-being assistance. The availability of trained therapists is thus compromised. As a result, patients sometimes have to wait agonisingly for the clinical assistance they require. Then the fundamental usability of bot help lies beyond these rising patterns.

5.3 APPLICATIONS OF CHATBOTS

Media publishers have discovered that chatbots are a powerful way to connect and track interaction with their audiences in order to gain useful insights into the desires of readers. Chat on Facebook Messenger with the CNN and Wall Street Journal Chatbots and receive the latest news directly in Messenger, without having to visit their websites. Many publishers often use their chatbots with AI and machine learning technologies to predict what content their customers will be interested in. This is an exciting chatbot technology framework and it will certainly contribute to instant and more personalised content than ever before.

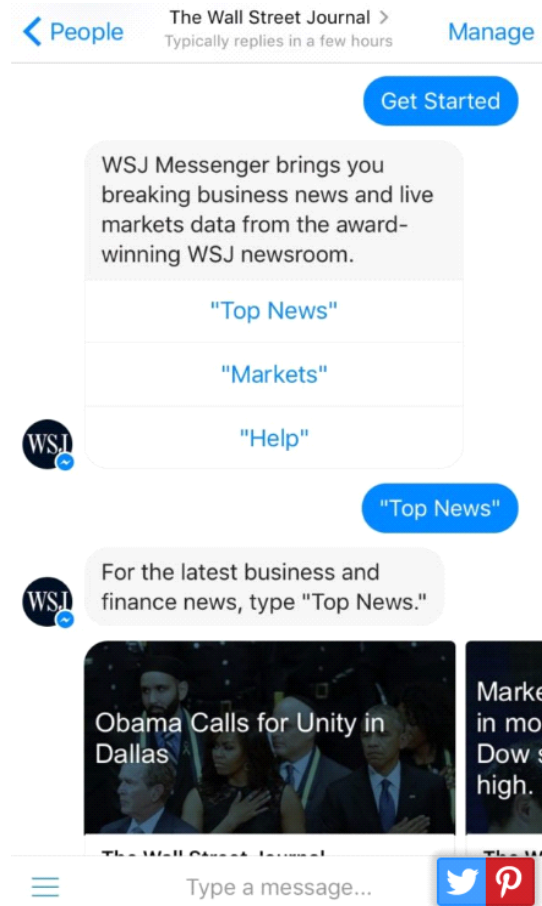


Figure 5 1 The Wallstreet Journal Chatbot[5]

Order Food

In Chatbots, numerous fast food giants such as KFC and Pizza Hut have invested in enabling clients to position their orders via conversations. By giving their chatbot called TacoBot some personality, Taco Bell went a step further to enhance the conversational experience. If the client mentions being hungover, TacoBot cracks jokes, uses emojis, answers questions about trivia, and even adds a cup of water to an order. Chatbots connect with customers, remind them of meals and nutritious foods, or even initiate certain simulated behavior, for example adding a dish to a cart or closing an account if desired. Chatbots may use artificial

intelligence to mimic human responses (AI). Users may not even know they are talking to a computer or a person while they speak with those virtual assistants.

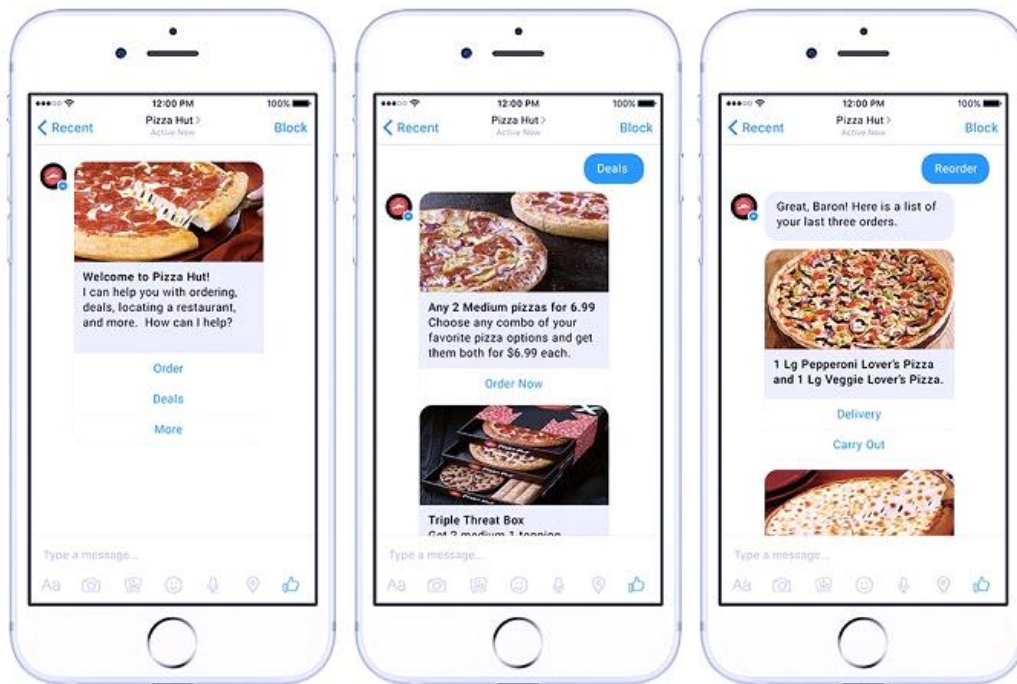


Figure 5 2 TacoBot is a food ordering bot of Tacobells[5]

Companionship

Endurance, a Russian technology firm, has created its companion chatbot for senior citizens and Alzheimer's disease patients. The key role of the chatbot is to be a virtual friend, to talk about general topics such as the weather, nature, hobbies, movies, music, news, etc. with senior people. The chatbot asks questions, responds to replies, can talk about different topics and share interesting Google news and information.

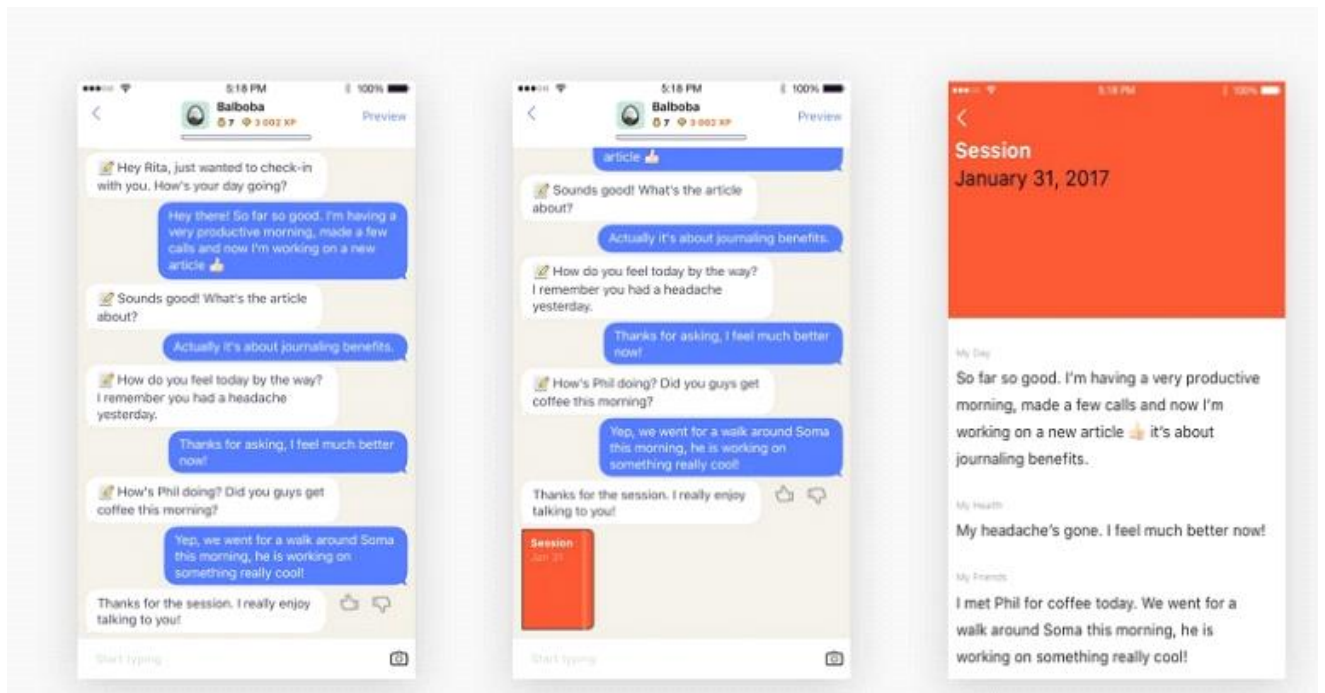


Figure 5 3 Endurance firm Chatbot to help people with Alzheimer's Disease[5]

Health Care

By easing the pressure on medical professionals by enabling quicker medical diagnosis, answering health-related questions, scheduling appointments and much more, chatbots have also made their way into health care. Florence is called an interesting Chatbot in health care. This robot is more like a robotic nurse and has a Facebook Messenger office. Florence will remind patients to take their pills, all they need to do is write in chat the name of the prescription, the number of times they need to take it a day and at what time. Each time the patient needs to take their meds, Florence sends a chat message.

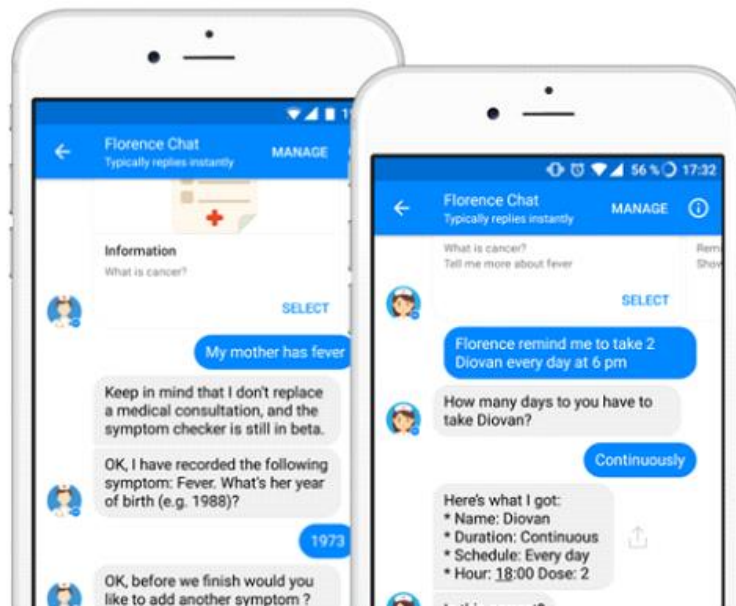


Figure 5 4 Healthcare Chatbot called florence[5]

E-Commerce

Chatbots also improve the shopping experience in the e-commerce industry. With the help of chatbots, clients can now scan and shop more conveniently. Through their ShopBot, eBay has invested in Chatbot technology, a virtual shopping assistant that helps clients locate the things they want at the desired price range.

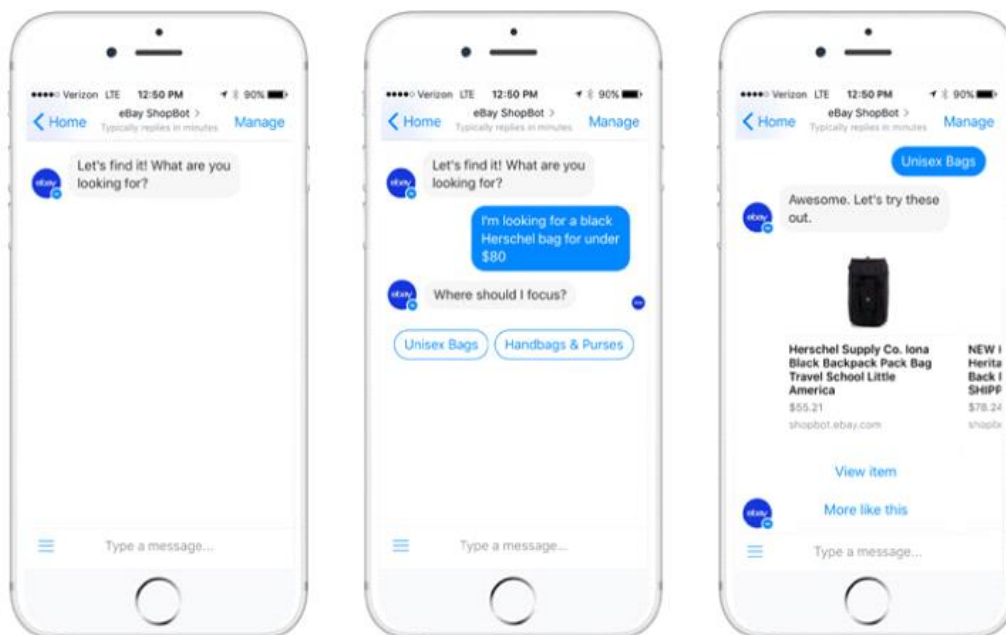


Figure 5 5 Ebay chatbot to help customers shop[5]

Customers only need to enter specifics of what they are searching for (e.g. telescopes under \$150), to find the best fit, ShopBot will ask you all the necessary questions. This is a perfect example of how chatbots can expand the shopping experience beyond what can be provided by traditional e-commerce sites. E-Commerce chatbots add a handy and professional Salesman to the modern world through their interaction experience. The chatbot on e-commerce will engage with consumers, consider their needs through conversations and provide related product suggestions. Through using the power of the NLU, the e-commerce chatbot will enter into discussions, consider their needs and direct them to the things it wants, and make customized product recommendations. This further enhances the consumer retention activities of the e-commerce website.