ILLUSTRATION ON THE SUPERIORITY OF DJANGO OVER THE OTHER PYTHON WEB FRAMEWORKS

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Abstract

The ensuing research paper encloses about the comparison between the various web frameworks of python and why the combination of python and its web framework Django is chosen to be the best and flexible framework. Frameworks offer a wide structure to the developers for the development of application. Recent surveys prompts that Python is going to be the fastest growing and easy to learn language. Python Frameworks are therefore assumed to be the most promising choice for any application development or for improving the skill set of various backend developers. Django takes care of the web development process in easier way and is developed by much more experienced people.

I. Introduction:

We all have the basic knowledge about the construction of a building: we require bricks and iron rods. Bricks are the building blocks that provides the base while iron rods make the structure. Here python plays the role of bricks and Django that of iron rods. Django framework develop and provide structure for web applications, web services and software. We get number of options when it comes to web application development frameworks – including the correct framework, specific language, correct libraries and so on.

Python has gone through an extreme change since its release 25 years ago as many additive features are introduced. There are many advantages of python which can be witnessed by the charts in the recent years over other programming languages and widely popular among programmers. Python has many characteristic features like it is Interactive, Interpreted, Modular, Dynamic, Object oriented, Portable and the list goes so on. Many of the software development companies prefer language because of its multifaceted features and clean and neat programming codes.

There is much to be said about the advantages of Python. It has been the most popular development language in the recent years and it continues to be favoured among many skilled
developers. Now narrowing our discussion on the comparison of the various web frameworks of python and the reason behind Django being the superior.

II. Comparison of Python with other languages:

![Comparison of Python with Other languages (in % approx)](image)

**Fig.1**

1. **C#:**

   C# is a modern, general-purpose programming language which is object oriented, component oriented and easy to learn language. It is a structure language that produces efficient programs and can be compiled on a variety of computer platforms. It is part of .NET framework.

2. **C++:**

   C++ is one of the world's most popular programming languages that can be found in today’s operating systems, Graphical User Interfaces and embedded systems. It is an object-oriented language that can be used to develop various applications and can be adapted to multiple platforms. It is portable and gives a clear structure to programs and allows code to be reused that lowers the development costs.

3. **Java:**

   Java is a popular programming language that is object oriented. It has various features like it is easy to learn, more secure, free and open source etc. It was developed by Sun Microsystems in 1995. It is an platform independent language that follows the principle of WORA (“Write Once Run Anywhere”). It is fast and powerful and is supported by a large
community group. It lowers the developmental costs as it provides a clear structure of programs. It is used for mobile applications, web applications, games, Database Connection and many more.

4. Typescript:

It is completely object oriented with classes, interfaces and statically typed like C# or Java. It is a typed superset of JavaScript that compiles to plain JavaScript. Angular 2.0 is written in TypeScript. Mastering it can help programmers to write object-oriented programs and have them compiled to JavaScript, both on server side and client side. With the great knowledge about it, programmers can build web applications much faster, as it has good tooling support.

5. Kotlin:

Kotlin is a general-purpose programming Language sponsored by JetBrains and Google through the Kotlin Foundation. It is statically typed and a cross-platform language with type interference. It is designed to interoperate fully with Java that mainly focus on JVM but can also compile to Javascript or Native code. It is officially supported by Google for Mobile development on Android.

6. JavaScript:

JavaScript often abbreviated as JS is a high-level, just in time, object oriented programming language. Apart from HTML and CSS it is a core part of World Wide Web. It enables interactive web pages and is a major part of many web applications.

7. Python:

Python a great choice for beginners and experts as it is easy to use, powerful, and versatile. Python’s readability makes it a great first programming language — it allows to think like a programmer and not waste time with confusing syntax.

It is superior than other languages as:

- Easy to learn
- Highly Scalable
- It is constantly Updated
- It has proper libraries to support
- Efficient
- Reliable on a secure environment
- Availability of reliable resources
- Availability of strong support by Community in industry.
Python is popular as a ready made solution to every problem is made available by the community and they work tirelessly to improve the language. It has a number of corporate sponsors which make the language more popular. Tech Giants such as Google uses Python. The demand of python is rising up so much that it is to believe, it will take over Java in the coming years.

The growth of python with the statistical analysis is given below.

### III. Growth of Python over the years:

![Growth of Python (in %) (approx)](image)

According to an estimate, there are 8.2 million developers in the world who code using Python which is larger than those who program in Java, which are around 7.6 million. The adoption of Python has been rapid, and has gained around two million new developers in 2018. Several firms have estimated the number but still it’s not known specifically that how many developers are there in the world.

Frameworks provide support for a number of activities such as interpreting requests, producing responses, storing data persistently, and so on. So, concentrating and narrowing our focus more on the Python Web Frameworks.

### IV. Illustration on Python web Frameworks:

By far, the most popular Python frameworks are Django and Flask. But that doesn’t mean we should discount the potential of other frameworks. Some of the frameworks are:
1. **Pyramid:**

Pyramid is an open-source Python-based web application framework. Running on Python 3, Pyramid keeps up with technological improvements. The most salient feature of Pyramid is its feasibility to work efficiently with both small and large applications. Its goal is to do as much as possible with minimum complexity.

2. **Falcon:**

Falcon is a bare-metal Python web API framework. By “bare metal” we mean that, it is used for building very fast application backends and microservices. The framework is named as falcon, symbolizing how quickly Falcon works. This framework allows developers to handle most requests and craft cleaner designs. Falcon never opposes its developers in the selection of libraries for databases and authorization.

3. **Tornado:**

Tornado is a Python web framework and asynchronous networking library that focuses on speed and the ability to handle large volumes of traffic. It uses a non-blocking network I/O and can handle 10,000+ concurrent connections. This makes it a great tool for building applications requiring high performance and tens of thousands of concurrent users.

4. **Flask:**

The foremost idea behind Flask is to help develop a strong web application foundation. It is a framework of Python licensed under BSD. It provides the usage of any extension that meets our needs. Flask’s lightweight and modular design makes it easily adaptable to developers’ needs. Flask is chosen for any and all projects.

5. **Django:**

Django is a free open-source full-stack Python framework. It tries to include all the necessary features by default instead of offering them as separate libraries. Some of the ideal features of Django are:-

- Authentication
- URL routing
- Template engine
- Object-relational mapper (ORM)
- Database schema migrations.
These features make Django highly scalable, excessively fast, and extremely versatile. Django uses its ORM to map objects to database tables. The databases that Django works with are:

- PostgreSQL
- MySQL
- SQLite
- Oracle

With Django, you can craft any web application from small-scale projects to complex websites. Django’s user base is expected to grow, as many developers see this framework as the best choice for emerging technologies such as machine learning. Also, in 2020, the Django community is planning to release more libraries to meet the growing demand.

6. Others:

Dash is an open-source Python framework, used by data scientists who aren’t very familiar with web development. It is effective in building analytical web applications.

Fig. 3

“Why Django is better and preferred when compared to any other frameworks!”:

A. **Maintain** Modular Architecture:

Django is open source and free and follows the principle of “Don’t Repeat Yourself”.
which means developers can use the existing code again and focus on the unique one. Its architecture is divided into multiple modules which can be used as and when needed according to the user.

B. **Security is the top Priority:**

It hides source code by default, and responds to a new vulnerability quickly. It has a strong user authentication model with the capability to configure different users, and its core team also alerts other frameworks of patches they should make to maintain security.

C. **Precious Time Saver:**

The principles of rapid development is followed by Django, in this developers can do more than one iteration at a time without starting the whole schedule from scratch. As a result, it costs a lesser time to get the project in the market.

D. **Adaptability and suitability** of any Web application:

With Django, projects of any size and capacity can be handled. Project Size is not an issue. It’s scalable, that gives the room to make applications that handle heavy traffic and large volumes of information. It is cross-platform and works with most major databases, allowing using a database that is more suitable in a particular project.

E. **Constant Updation** of modules:

Django is managed and supported by communities, forums, channels and websites. Many updates and additions are released by them that makes the usage of functions and modules to be more convenient to the user.

Many other features and advantages are their that makes Django superior to any other web framework.

**Extension of Python and Django Framework:**

**Python:**

- It is the most vastly used and prevalent programming language since 2015.
- Scope of Python in future is bright, as it provides libraries and tools for high data manipulation.
• One of the most used Python libraries are Matplotlib, that is used extensively by various companies and programmers.
• Developers uses Python for application development and system development programming.
• Reduced coding effort and better test performance make Python favourable among the programmers all over the world.
• Various future technologies that counts on Python are Artificial Intelligence, Big Data, Networking etc.
• Many product development companies such as Acqutek, AstraZeneca etc has been benefitted by Python in creating autonomous devices and software.

Django:

• It is highly community supportive, crowd and time-tested and scalable.
• It is used in the development of applications such as Pinterest, Instagram etc.
• It is a tool that has all the packages required for web development, and the future of Django is very safe and bright.
• Django has many number of generators, management tools for dependency, different libraries, API support etc.
• Django is most extensively used and is popular among all of the python frameworks. It is great for developing complex applications with many individual parts.
• The popularity of the framework is also on a constant hike.
• Django connects large number of third party applications that exist, and accelerates an already quick development process.

V. Conclusion:

In short, things are looking bright for both Python(in general) and Django(in specific), and we will be in a safe place for the next 10–15 years (at least), if we are investing our time in Python(and Django) presently.

New trends in the way of web application is coming in the scenario in a rapid pace. Therefore, we don't have any idea when a new technology will come into existence that will change the scenario completely. So it is suggested to take a peek into any new technology that is gaining enough momentum and stay updated with the current trends.

Thousands of websites are currently using Django, from daily newspapers to social media and sharing sites to major foundations and non profits. Where Python is the most used programming language by the tech giants, Django as a web framework is highly used for quick web application creation. It delivers good quality and transparent code writing that makes it useful for both developers and customers. Django has its own pros and cons. Django doesn’t support real time web application. It also takes away the burden of security.
issues like cross-site request forgery, SQL injection, cross-site scripting, and clickjacking. Developers can manage user accounts and passwords through a reliable user authentication system.

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