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IMPORTANCE OF API AND ITS APPLICATIONS-A COMPREHENSIVE REVIEW

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ABSTRACT

API is a frame work activity acts as an interface between a language and OS. This frame work include many Number of library functions. Its construction differentiates from one language to another language Base on platform dependent and independent. .NET facilities construction of common API for different language being they are dependent (or) independent but reliability is not achieved. Now a day's artificial intelligence plays a key role in making decision in wide range of applications. Due to this development, it is essential to construct efficient API mechanism. Before implementing intelligent API, it is necessary to study basics of API. This paper concentrates on basic principles and comprehensive study of API frame works proposed by different researchers.

Keywords: *API framework, Artificial Intelligence, .NET framework, Operating System, Programming Language, REST API.*

1. INTRODUCTION

A. API Definition

An Application Programming Interface is a collection of functions**,** activities, assignments and plan of action that aid to develop an application software. It facilitates swap the information between module to module without reconstruction of module. It [1] clarifies software development, creation and invention by permitting applicants to swapping data freely and securely. It is a interface that admit both applications to swap each other.

For example: - a person watching a YouTube whenever notification served by a system the user can easily switchover from YouTube to served notification here API used as interface.

B. API History

- ❖ In 1940's Maurice Wilkes and David Wheeler both scientists worked on a segment software library in The Electronic Delay Storage Automatic Calculator (EDCAC).
- ❖ In the year 1951 Maurice Wilkes and David Wheeler proposed a book "the preparation of programs for an electronic digital computer" it mainly contains information relates to initial API construction as well as future scope to further enhancement.
- ❖ In 1968 the phrase" Application program interface" is the first document in an article called Data structures and techniques for isolated computer graphics presented in an American federation of information processing societies (AFIPS).
- ❖ The term API was found to the concept of database proposed by Chris Date in the year 1974 write an article called the relational database management system and network model.
- ❖ In the year 1990 Carl Malamud describe API was defined as a set of services available to a programmer for performing certain task.
- ❖ Architectural styles and the design of network-based software Architectures at university of California Irvine in the year 2000 Roy Thomas fielding outlined Representational state transfer (REST) proposed an idea of a "network-based Application programming interface" that contrasted with traditional "library-based" APIs.

C. API Design Principles

1) **Discoverable:** If customer unable to find the required information by exploiting API, then the existence of the API can be neglected. API should be developed so that in can be easily discoverable.

2) **Reusable:** Reusability is [1] the main property which decreases construction cost of a component where same properties are needed to reconstruct.

3) **Modular:** Modularity represents reuse of a module which has already created with set of functionalities here the creation of same functionalities not needed by using the reusable property.

4) **De-Coupled:** API may not depend on source, target and vice versa also that it is independent, which increases the cost.

5) **Governed:** APIs utilizes Harvard university information technology (HUIT) standards. This standard provides for security, access management and logging etc.

In the design of API following question may arise for a better construction

1. The API [2] wants to be noticeable, so that another one looking for data can discover it and know which kind of data it provides and how do you access the data?
2. The API can possible to reuse and reconstructed?
3. The API modular had their benefits for doing it more modular?
4. Is this API belongs to a system which may undergo a continuous change, or some other day can be replaced or they widely used? And also, there is a need to disassemble the target and source of this API?
5. Is these wants to implement Harvard university information technology (HUIT) standards for security, compliance, logging, monitoring, specific access controls and provisioning features? Does it want to be governed?

II. LITERATURE REVIEW

Y S.M. Hari Krishna and Rinki Sharma[3] done aSurvey on application programming interfaces in network function virtualization and software defined networks**.** In this digital era, service-oriented applications play a key role in business within the web. The business applications are having high impact when compared with other application. Web interfaces are very important in majority of applications essential in payments especially RPC method is following over a decade and REST is also using widely in such applications. This article proposes software define networks and network function virtualization domains usage in web interfaces.

Lars Buitinck et al. [4] proposed a API structured for machine learning software. Nowadays python become as popular in designing of Machine learning algorithms. Popularity is achieved due to its strength of libraries especially scikit-learn. This work concentrates on discussion of different design choices available in creation of machine learning algorithm as API interfaces using scikit-learn library. The main advantage of this library is inheriting information from the existing things. It is also necessary to discuss how the APIs of python libraries are very useful and consistent in experimenting different ML algorithms by substituting new definitions. The power of scikit learns is identified with great exposure in utilizing real time application.

Xianjun Chen et al. [5] developed a Restful API Architecture depends on the principles of Laravel Framework. In the heterogeneous system, environment utilization web services are most common for the purpose message communication and integration. After the SOAP paradigm restful API become as main stream in providing essential services for web. This work PHP and LARAVEL framework activities are essential things in development restful API. Finally, this work decision about problem during restful structure and its detail implementation.

A Heryandi [6] introduced application programming interface to monitor academic activities of a student by exploiting FCM. Triggering the student information to the parents is very important. Student academic activity monitoring many of the college and universities may not have accessibility with parents and vice versa. To avoid this gap an effective automatic monitoring and messaging passing system is very essential. The present work develops firebase cloud messaging technology to notify the student activity events without making delay.

Utkarsh Singh [7] proposed a REST API framework to develop and design web services.Rest stands for representational state transfer which is a kind of approach used to communicate the data in the web services development. It follows stateless model representation. When client requires any information, it has been processed by via API and response is provided by web server language. The services are rest not limited to cloud computing and internet of things. It may be utilized for any kind of micro services.

Michael Meng et al. [8] did documentation on API. Documentation is a key factor in evaluating the success of application programming interface. The documentation provides necessary information and flow of interface evaluation which able to understand the purpose of API. Sometimes the documentation itself not sufficient to understand the API. To overcome this problem proposed article presents a semi structured environment which helps to understand activities of API. In this method questionnaire, goals, strategy and resources mainly identified as primary sources and applied on API to identify the quality of it. Finally, the result work concentrates on evaluation of overall main features completeness of clarity and relevance of information to maintain the API documentation clearer. Further this documentation may utilize by developer and working professionals for usage.

Chengcheng Wan et al. [9] implemented an automated testing of software which is processed by machine learning APIs. In this digital era, numbers of software applications are developing through machine learning tools to evaluate complex task. To perform such activities the effort of human needs more attention to collect relevant inputs to finalize the behavioural process of given task and compare it with human analysis. Even when task is under the process any misbehaviour is identified. It is essential to eliminate such kind of things by utilizing APIs along with ML procedures. The main intension this work is to generate an API which identifies misbehaviours and changes the activity of the code. Finally relevant judgement is expected from the proposed ML based API.

Supattra Puttinaovarat and Paramate Horkaew [10] developed an application programming interface to predict flood occurrence by using crowd sourcing data and geospatial big data. In this living environment, disasters are very common which are showing severity on human lives and also other living organisms. The most frequently happening disaster is flood. Due to unawareness of predicting the floods causing more damage with the available technology various flood forecasting methods are developed but they are unable to prevent them. Till manpower is needed to collect the previous information and process it to expect the flood arrivals. But in the Real time environment it is still not working out. Nowadays machine learning based algorithms are very useful in predicting such kind of natural disasters especially maximum likelihood classification radial based functions are utilizing in forecasting the natural disasters.

Diego Serrano and Eleni Stroulia [11] proposed an IDE for efficient REST API composition with the help of linked metadata called LRA workbench.Due to digitization access of web services are continuous increasing the time consuming and error pruning process is not automated still today. Data integration is very important. Nowadays linked data technologies, linked rest API methodologies provide description of various formats of web API. In general, unconventional graphs are common associated datasets. This works purposes LRA work bench methodology to provided subsequent conventional graph models with respect to associated datasets. Subsequently a study has done on LRA workbench development environment to evaluate structure complexity, time complexity, manual compositional of APIs.

III. RESEARCH FINDINGS

1) APIs are used to develop interface for various real time applications like natural disaster prediction.
2) REST architecture is mainly used for various API applications.
3) LARAVEL framework can enhance REST architecture.
4) Python libraries help in API construction with its inbuilt packages.
5) API is used construct web interfaces.
6) LRA workbench can be used to evaluate the APIs.
7) API can also be used in recent advances of technologies like machine learning, deep learning etc.

IV. RESEARCH CHALLENGES

1) Simplification of API interface becomes arduous.
2) API construction complexity increases as features increases.
3) Construction of interactive API time consuming and complex conversation trees are need.
4) Integration of APIs requires development.
5) Require different APIs for different application.
6) Portability of APIs is limited.

V. CONCLUSION

The overall study of literature says that the conceptual framework of API provides different kinds of web services variety no of applications are tested by various researchers. The throughput of API with machine learning algorithms being complex problem in a systematic position. The efficiency, simplicity, accessibility and reusability are the context consistently discussed throughout the survey. Composition interfaces are introduced to learn and accomplish complex task with in a small amount of time which has been proved in scikit-learn library usage. REST is the new kind of API development which replacing a remote procedural call.

Further SDN and NFV contribution providing micro services with higher quality. With this comprehensive study it is concluded that API framework designing and accessing not limited to particular domain extensibility. It is useful in various domains like sharing confidential information, providing security, enhancing the efficiency, understand the industry needs according to that changes are to be needed. Further development lifecycle of API is to be enhance according to the knowledge of domain.

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