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Experimental Study of PaaS, Its Implementation Methods and Advantages and Challenges

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Abstract: - This paper will explain the concept of PaaS in detail. PaaS is platform as a service. With the help of cloud computing, there are vendors who will provide platform like hardware and software online to be used by the employees of the business or organisation. The business can send their requirements to the vendor who will provide platform as a service to them based on per service charge basis. The paper will explain types of PaaS, Characteristics. Advantages and challenges in implementation of PaaS.

Keywords: - PaaS implementation, Challenges, Tools, Categories, Benefits.

Introduction: - In the era of cloud computing, many services are provided at a centralised placed and can be accessed by anyone who is authorised user and can be accessed remotely. The user needs to pay only for the type of the services being used. It is convenient method of having the services at one place and easily accessible. The vendor will understand all the specifications and requirements of the client and then implement all those services in one cloud and gives the best possible package for the user to use. PaaS is the way of providing platform as a service to the client to use it for their business. Some companies cannot afford to buy all the servers and hardware and software for business purpose as they cannot afford high budget platforms. This is when PaaS comes into the picture. The cloud computing vendors provides the necessary platform needed by the business at a reasonable cost. The user needs to pay only for the services required by him. The user can modify the list of services based on his requirements. Platform as a service may include hardware and software requirements like storage devices, servers, systems, application programmes etc. It helps to provide infrastructure as well as the platform on which it will be implemented.

Categories of PaaS: - Following are the types of PaaS [1]

1. Public PaaS: - In this type pf implementation of PaaS, the vendor provides the infrastructure and the platform which is available publicly in the cloud. The developers of the organisation need not to develop the infrastructure and platform as they can access it from the available public cloud made available by the vendor. Small businesses and organisations use this type of services as it is reasonable for them to afford and they can increase the performance of their business without wasting time on the implementation of the platform and the infrastructure inside their organisation. Big companies which have

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more crucial implementations of the services will need something which is only available for them to use. So, they do not use Public PaaS for their organisation.

2. Private PaaS: - This type of PaaS is used by large organisations where they will have crucial applications and software to be implemented. They will let the vendor know about their requirements and are ready to pay little extra in order to receive platform as a service which is private and unique to them. The public PaaS is not secure enough for big organisations. The cloud vendor based on the specifications of the business will implement cloud which is for private use for that particular company and can only be used by that company. This way it be secured as compared to the public PaaS.
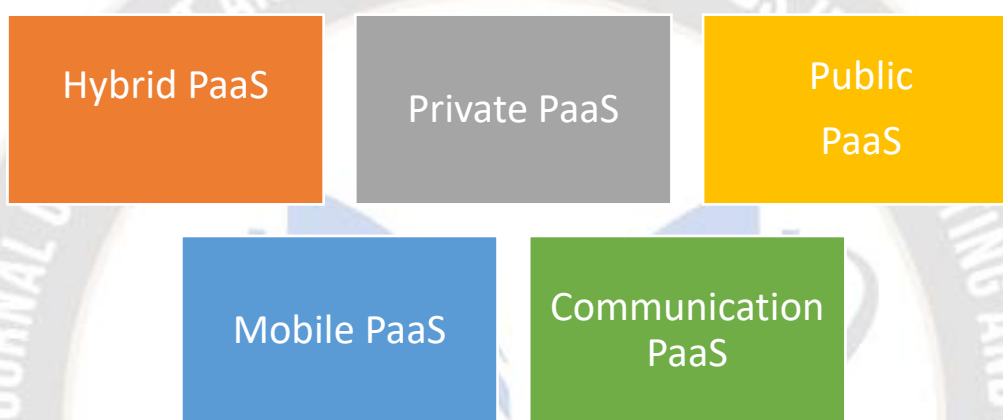

Figure 1 Categories of PaaS

3. Hybrid PaaS: - This is the combination of both public and private PaaS. This will be implemented in hybrid cloud and can be utilised by the organisation. This model will include the advantages of both categories of PaaS.

4. Mobile PaaS: - This category will provide the services through a web browser for the use in mobile phones. In this model, the vendor will provide services needed by the user in the mobile devices. Any number of mobile devices can access those services provided by the vendor. The cost of such cloud providing services for the mobile devices will depend upon the number and type of services used by the client.

5. Communication PaaS: - This is the type of PaaS where the cloud will provide services which are required for the communication of the devices in the network. It provides facility to use video, voice etc used for the communication. The cloud will provide all the necessary platforms, software programmes in the cloud which is needed for communication in the organisation.

All the above-mentioned categories of PaaS help a lot for the business to run their business smoothly. They only need to mention the requirements to the vendor and then the vendor based upon the nature of the services provided by the business, will implement everything in cloud and give for use to the business on reasonable cost.

Advantages of PaaS: - [2]

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> ➤ Time Saving: - A lot of developer's time is saved as there is not need to implement the infrastructure and platform separately. The developer can then spend his time in other major tasks as he can save his time to code the infrastructure of the system.

> ➤ Cost effective: - The cost factor reduces to large extent as the businesses need not buy the whole infrastructure and can access the necessary platform and infrastructure services provided buy the vendor. In this way they are supposed to pay only for the services used by them from the PaaS cloud.

> ➤ Flexible: - Due to its flexible nature, the users can access it from anywhere and anytime that suits them. There is no specific duration or time constraint on the service use. The billing will be done only for the services being used.

> ➤ Secure: - As it is the responsibility of the vendor to provide all the services based on the requirements of the client, it is his responsibility to make sure that the access to these services will be safe and secure. They will use high tech security software programmes due to which the services provided are safe and secure.

> ➤ Increased performance: - This helps the business to increase it performance as a lot f time is saved due to which they can speed up their deployment or delivery process which in turn will increase the performance rate of the organisation.

> ➤ Customisation: - The PaaS cloud computing helps the users to custom their plans based on their requirements. This means that the vendor provides the facility to modify the service plan as per their need.

Challenges in PaaS: -

> ➤ Cannot be implemented fully: - In some cases it is not possible to convert all the infrastructure needs of the organisation in to PaaS cloud. In this case the business need to either implement those platforms in his own company or may need to forget about it and search for other substitutes.

> ➤ Poor performance: - As the services provided by PaaS is available in a cloud, if any of this is down due to network issues then the employees may not be able to work and need to wait till the time the cloud is up and running.

> ➤ Dependency on Vendor: - Organisations accessing the vendor services are completely dependant on the vendors for each and every requirement. They cannot work till the time all the services are implemented by the vendor.

> ➤ Compatibility issues: - If the infrastructure and platform of the organisation is not implemented in synchronisation of the services and applications provided by the business then due to compatibility issues, the performance of the business will degrade.

Points to keep in mind to implement PaaS: - [3]
There are certain points which should be kept in mind while transferring the infrastructure requirements in the PaaS cloud: -

1. Do not ignore already invested technology: - While shifting the services of a business to the cloud, one should not ignore the already existing technology investment. It should be done in such a way that the existing technology can also be of use even after the services are shifted to the PaaS cloud.

2. Simplicity: - The business should not make complex decisions and should keep the PaaS requirements simple and comprehensive. This means the business should choose only one vendor who has the capability to meet all the business requirements.

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3. Migrate development to PaaS: -First of all, the development of the applications of the business should be moved to PaaS which is reliable way of testing the PaaS environment. It proves to be beneficial as it will help tp develop the application in non-functioning environment and the developer and tester can have direct access to monitor the process.

4. Security compliance: - The business should also look for the vendors who will provide better security options for the implementation of the PaaS.

5. Prepare requirement list: - The business should first of all make all list of all the services which they will need. They should do complete requirement analysis based upon the types of the services they provide to their clients. Based upon this requirement list they should start looking for the vendors which can help them to implement all their requirements at a reasonable cost.

6. Requirement analysis by Vendor: - Once the vendor receives all the necessary requirements, he will also start analysing them and will see how they can serve them. They will analyse how the pre-existing infrastructure can be shifted using PaaS and also if there is need of everything new.

Once it is done, they will get back to the business to provide them quotation and best possible solutions according to them. And if the business client agrees to them then they will start implementing.

7. Designing and Testing: - Once the client agrees, the designer of the vendor team will start designing the overall solutions based upon the requirement mentioned. All the coding and technical detailing will be done in this stage once the designing part is done. Now the tester will test the prototype and check for any fault in the PaaS implementation. If there any bugs then the whole process will be repeated until desired result is obtained.

8. Deployment and maintenance: - This is the final step in which the vendor will deliver the PaaS to the business for use. The developer of the business will start using the services provided by the vendor. The vendor maintenance team will continuously watch the whole process to see if there are any issues faced by the employees of the business while using the services provided by them. If so then the vendor will rectify the issues and will help the business till the time they are satisfied with the services.
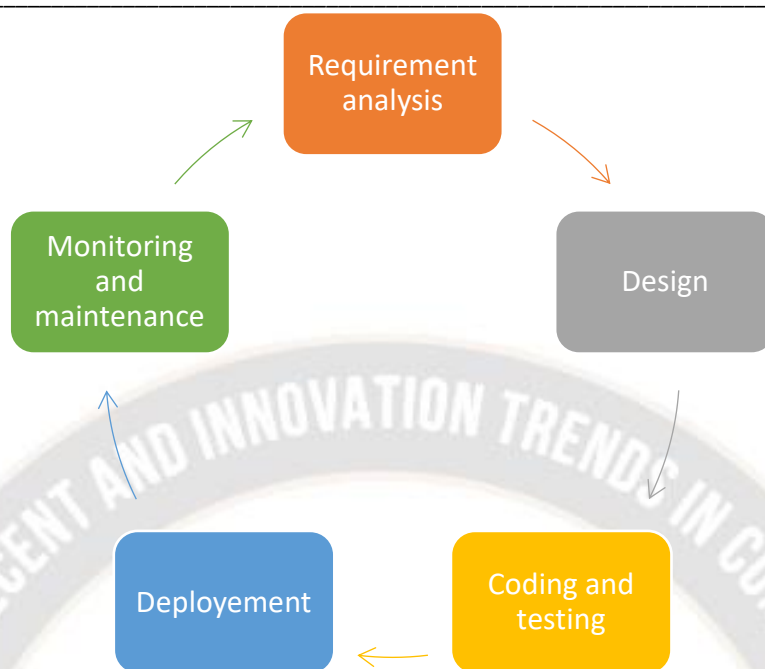
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Figure 2 Process for the implementation of PaaS

Best PaaS providers: - [4]

Following is the list of the PaaS providers: -

1. Sales Force: - It is used by the developers to build many applications which are multitenant. Many tools and programming language like Apex and Heroku are provided.
2. Microsoft Azure: - It will support any king of operating system, language and many more. It also facilitates the developers to use video etc to use in their deployment.
3. IBM- Bluemix: - This is used to provide more security and control. The languages provided are python, PHP etc.
4. VMware- Pivotal CF: -It supports public, private as well as hybrid cloud. It gives the opportunity to the developers to use any language for their coding as it has the concept of flexibility.

Conclusion: - In short PaaS cloud computing is the way of providing infrastructure support and platform support to its clients. The PaaS services will include different variety of storage devices, servers, clients, hardware and software which is available in a cloud and can be accessed by the clients anytime and from anywhere provided they are the authorised clients. Many PaaS Providers are available to provide such services. The performance and efficiency of the business increases if they are able to implement proper PaaS cloud with the help of the vendros.

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