University of Science and Technology

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AFrameworkForImplementing a Cloud Platform as a Service

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree M.sc. of Information System

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Abstract

The developing phase of applications consider as important and critical step in implementation phase. In this phase programmer can select (write code) language and algorithms to achieve a goal of application. After that test code of application   it is also most important step in implementation phase In this step the developers construct test environment to evaluate result to achieve a goal of application.

Traditional development models have big problems like cost, delay, limitation, etc. Platform as services is best solution for most of problems on traditional development application model that faced by programmers to give them same traditional features but speedy and reduce cost and increase collaboration.

The objective of research is proposed a new framework for building platform based on cloud computing to increase the speed, collaboration, reduce cost and complexity to evaluate the proposed framework, this study conducted an empirical study by setting up an experiment for Nile center, software development department. The achieved results revealed that, the proposed framework can overcome the tradition framework limitation.

المستخلص

الحوسبة السحابية تعد من اكثر المواضيع ذات الاهتمام اليوم نسبة لما تقدمه من خدمات جديدة ومختلفة كليا ولذلك ولذلك اصبح مجال واعد لاعداد مزيد من البحوث والدراسات عليه من اجل اكتشاف المزيد من ميزاته,البرمجة الفعلية للتطبيق تبدا من خطوة كتابة الشفرات البرمجية باختيار احدي لغات البرمجة المناسبة واختيار كل الخوارزميات التي تحقق الهدف من بناء هذا التطبيق وهذه الخطوة يقوم بها المبرمجين , ثم بعد ذلك خطوة اجراء الاختبارات علي هذا الكود البرمجي لمعرفه وتقييم مدي ملائمته للنتائج المرجوءة منه وهذا الخطوة يقوم بها متخصصي تقنية المعلومات، النموذج التقليدي لبناء التطبيقات لديه عدد من السلبيات مثل التكلفة والمحدودية والتاخير في الاعمال وتعد المنصة السحابية افضل حل لمعظم المشاكل في البرمجة التقليدية نسبة لانها تقلل تكاليف البرمجة وتزيد من سرعة بناء التطبيقات وايضا تزيد من نسبة التعاون بين المبرمجين لكتابة الاكواد البرمجية.

الاهداف الرئيسية من البحث هي تقليل التكلفة وازالة التعقيد وزيادة السرعة وزيادة التعاون بين المبرمجين وكل ذلك بالنسبة لعملية برمجة التطبيقات الجديدة .

منهجية البحث تعتمد علي شرح فكرة ومفهوم المنصات السحابية وكيف يمكن ان نستخدمها فعليا في برمجة التطبيقات وايضا بناء نموذج جديد يحدد الية بناء التطبيقات استنادا علي المنصات السحابيه ولتقييم النموذج المقترح اجرينا تجارب عملية كمثال لمجموعة من المبرمجين بمركز النيل للابحاث ، وكانت النتائج ايجابية تدل بان هذا النموذج الجديد قد حل مشاكل الادراة والصيانة والتكلفة والمحدودية التي تعتبر من سلبيات الاطار التقليدي.

Introduction

1.1. Introduction

Platform as a Service (PaaS) is the hottest topic in cloud computing. Whether their heritage is in hosting, application development, network or managed services, cloud service providers are building PaaS components to round out their portfolios and attract new customers.

Many providers are just getting started with their PaaS launches, others are still considering their strategies.

1.2. Problem Background

Building and running on-premise applications has always been complex, expensive, and risky. Each application required hardware, an operating system, a database, middleware, Web servers, and other software. Once the stack was assembled, a team of developers had to navigate complex programming models. A team of network, database, and system management experts was needed to keep everything up and running. Inevitably, a business requirement would require a change to the application, which would then kick off a lengthy development, test, and redeployment cycle. Large companies often needed specialized facilities to house their data centers. Enormous amounts of electricity also were needed to power the servers as well as the systems to keep them cool. Finally, a failover site was needed to mirror the data center so information could be replicated in case of a disaster .

Yet, as the cloud market matures, PaaS may represent the "killer app" that makes the cloud worthwhile for enterprises, and the greatest opportunity to maximize cloud revenue for providers. PaaS represents the glue that integrates custom and commercial apps and corporate IaaS and SaaS, without requiring cumbersome programming. PaaS can also make it possible for non-programmers to create their own applications, thus enabling small businesses and non-technical departments to automate their business processes .

1.3. Problem Statement

The main problem in most software companies lies in:

i. Management of hardware and software components.

ii. Maintenance of hardware and software components.

iii. Cost of hardware and software components.

iv. Limitation of hardware and software components.

Especially for small businesses with limited resources, in the field of software developer there is considerable need to develop and deploy, implement and test the software.

Additional problems:

- Any change in business requirement will require a change to the application, which again starts lengthy development, test and redeployment cycle.
- Software and hardware upgrades must be managed.

- Large amount of electricity is also needed to power the Servers as well as for system cooling.

- Data must be replicated at different data centers so that it can be restored in case of disaster.

1.4. Research Objective

- To develop framework based on platform as a service.

- To develop, store, test and deploy application without need to the purchase of hardware and operating systems, and tools that is obtainable as services via the Internet.

1.5. Scope

The scope of this research is:

- Proposing framework based on cloud.
- Build web applications without installing on any tools their computer to use a platform as a service.

- Deploy those applications without any specialized systems administration skills to use a platform as a service.

1.6. Research Contributions

New framework using Platform as a service to develop applications for software companies in Sudan.

1.7. Thesis Structure

This thesis contain six chapters .Chapter two review the literature of cloud computing and platform as service. Chapter three describes the research methodology, empirical study, operational framework. Chapter four describes the proposed framework model. Chapter five illustrates results of questionnaire and evaluation for framework. Chapter six states the conclusions and recommendation for future work.