INTRODUCTION

Cloud computing has been evolving rapidly throughout the last few years. Along side this evolution, many domains are moving to, and benefitting from the cloud paradigm. Software Engineering is one of the potential domains that can benefit from clouds. Nowadays, software teams are usually distributed across continents, each team member has a development machine and need to install all the necessary tools and applications. Some services need to be provided to the team such as: shared code repositories and issue tracking tools. These services need configuration and maintenance, which consumes a lot of the team’s effort. Therefore, provisioning of software developments on the cloud will be improve the overall performance of the software development teams. This research aims to investigate how best to support software engineering with the cloud paradigm and proposes an open, extensible, and elastic cloud-enabled software engineering platform which uses workflows to represent the software processes activities in order to facilitate collaboration, quality assurance and automation in software projects.

MOTIVATION

Cloud can bring several benefits to software engineering including:

- Saving resources (time, money, manpower) that are wasted in setting up and configuring software development environment.
- Facilitating collaboration between geographically distributed teams involved in software projects.
- Helping software engineers to focus their efforts on the actual business problem they are trying to solve rather than dealing with development environment issues.
- Bridging the gap between development and deployment environments which sometimes results in compatibility issues.
- Utilizing the cloud’s elasticity to optimize the performance of some computing intensive software engineering tools such as: model checkers or provers.
- Software development tools can be managed and updated centrally without the need for user involvement in the update process.
- Software development artifacts will be stored and backed up on the cloud.
- Software developers can try different versions of development tools easily and compare the results. Traces can be stored and used later as a proof for certification authority. This is extremely needed for critical systems and their development tools.

OBJECTIVES

The objectives of this research are:

- Investigate using existing workflow systems for software development processes.
- Investigate the existing software development process modelling and how usable they are.
- Choose/ develop process modelling notation to capture software processes and support their enactment in the cloud.
- Implement an enactment environment to enact software development processes.
- Investigate the potential of applying provenance for software development in order to improve the software development processes.

PROPOSED ARCHITECTURE

In order to support utilizing the cloud for software development, we propose an architecture for a workflow enactment service in the cloud. Software processes can be viewed as workflows since they are a special case of business processes. Using workflows allows to embed data and control flow in the process. The artifacts produced in the process are saved in cloud which makes them accessible by all team members. Development tools are also to be integrated in the enactment environment so that developers can choose to use their preferred tools and versions. The architecture is illustrated in Fig 1.

CONCLUSION & FUTURE WORK

Using workflows for software processes allows modelling the components of the process and the data and control flow between them. Using the cloud as an enactment environment reduces the operational cost and time. Currently, a prototype of the enactment service is being implemented to run on a single cloud initially which will be extended to run on different clouds later. The future work includes: assessing the modelling notation after applying it to more case studies and applying provenance to provide reasoning about the software processes.