The implementation of a framework for utilizing open-source cloud services in tertiary academic institutions

About The Presenter

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What Will Be Covered

- ✓ Brief Intro
- ✓ Potential Benefits
- ✓ Key Activities in Tertiary Institutions
- ✓ Word Cloud of Open-Source Cloud Services
- ✓ Literature Survey of Bespoke Frameworks
- ✓ Framework Design
- ✓ Case Scenario
- ✓ Conclusion

Introduction

- ✓ As technology continues to shape the way we learn and teach, it is crucial for institutions to leverage cost-effective and scalable solutions to provide quality education to students.
- ✓ Open-source cloud services offer a promising alternative to traditional proprietary software, providing flexibility, customization and collaboration opportunities.
- ✓ It is of paramount importance to explore the benefits of open-source cloud services in tertiary education and propose a framework for their implementation.

Key Terms

- ✓ **Open-Source** – refers to software or technology that is freely available for anyone to use, modify and distribute. The source code is openly shared and can be modified and improved by a community of developers.

- ✓ **Cloud Services** – refers to the delivery of computing resources including software, storage and processing capabilities over the internet. These are provided by third-party providers who maintain and manage the underlying infrastructure required to deliver these services.

Potential Benefits (1)

- ✓ **Costs saving**- typically free/low cost allowing institutions to save money on licences.
- ✓ **Scalability** –Cloud Services can easily scale up or down providing flexibility and agility.
- ✓ **Accessibility** –can be accessed anywhere where there is internet connectivity.

Potential Benefits (2)

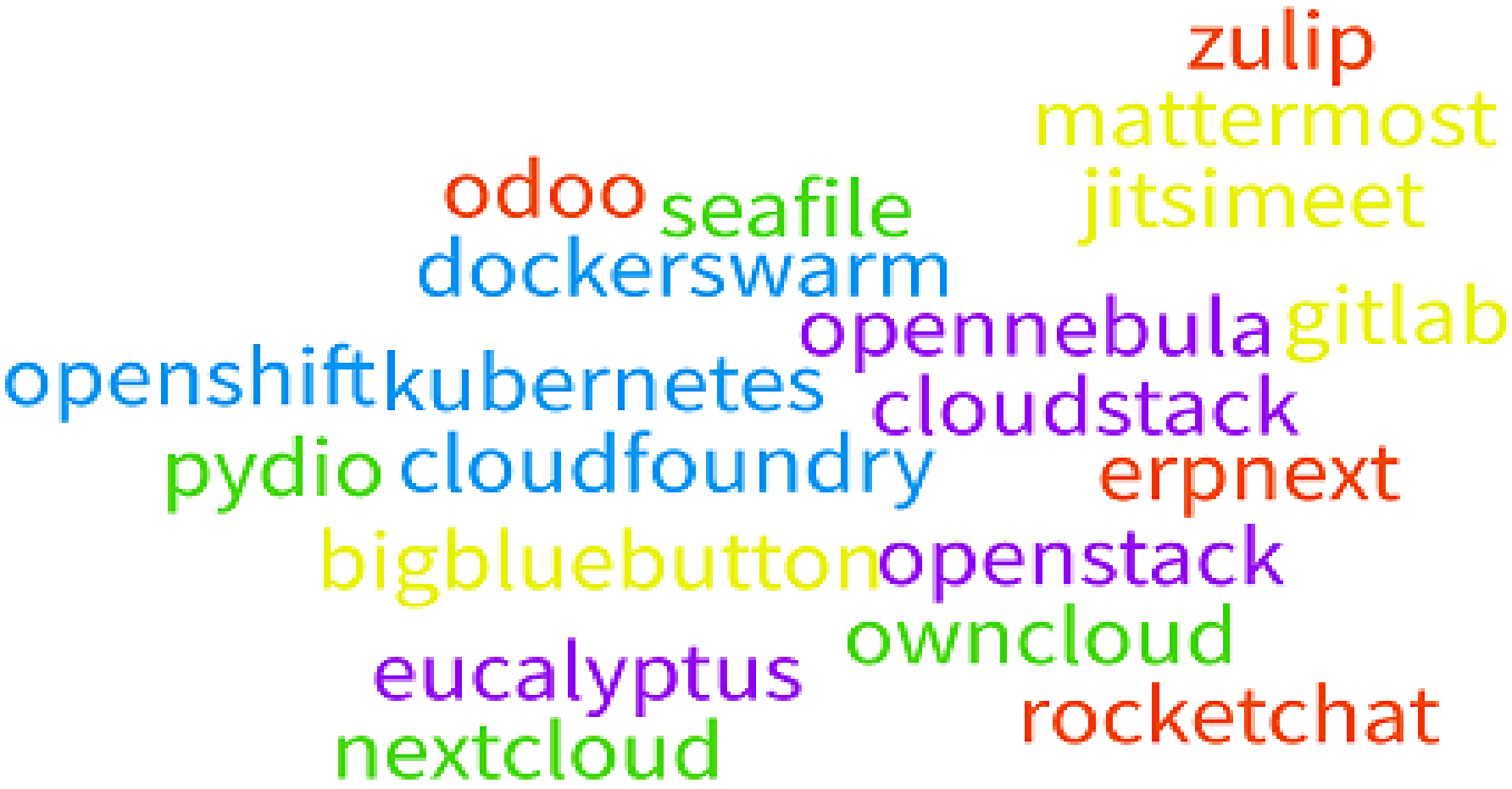
- ✓ **Customization** –can be customized to meet specific needs, providing tailored solutions that meet unique requirements.
- ✓ **Innovation** - constantly evolving and improving
- ✓ **Collaboration** – Encourage collaboration and knowledge sharing among educational institutions, enabling them to work together to solve common challenges and share best practices.

Important Activities in Tertiary Institutions

These are some of the key tasks at tertiary institutions

- Teaching and learning activities
- Research and innovation activities
- Community engagement and outreach activities
- Student support services
- Infrastructure development and maintenance
- Collaborations and partnerships with other institutions and organizations
- Library and information services

Open-Source Cloud Services



Literature Survey

Framework	Key Features
TOGAF	based on four architecture domains: Business, Data, Application, and Technology.
ITIL	The ITIL agile methodology features focus on a distinct component of the IT service's lifecycle: Service Strategy Service Design Service Transition Service Operations Continual Service Improvement (CSI)
Design Sprint	build and test a prototype in just five days. You'll take a small team, clear the schedule for a week, and rapidly progress from problem to tested solution using a proven step-by-step checklist.

Framework Design (1)

Step 1:Preliminary Phase - Self Assessment

The first step for any educational institution is to self assessment of the activities they do. Different universities offer have different activities . This lays the foundation for the softwares to be added in their matrix.

Step 2: Architectural Roadmap

This requirements gathering step focuses on defining the design vision and architectural roadmap, which aligns with the institutional operation strategy and goals.

Framework Design (2)

Step 3: Cloud Information Systems Architecture

This step deals with defining the cloud services and their interactions with the institutitional activities.There should be a marriage between services on offer vs institutional activities. Loose coupling should be encouraged to handle unrelated but interlinked services. For instance, Use of ERPNext to handle adminisrative authentication of registered students to attend a Bigbluebutton offered class.

Step 4: Refactoring and Migration planning

This step involves developing a roadmap for implementing the new designs defined in the previous phases. At this step, it is important to engage a Solution Architecture so as to refactor into new and improved designs. The Migration phase involves the movement of refactored applications from proprietary service providers to open-source cloud services.

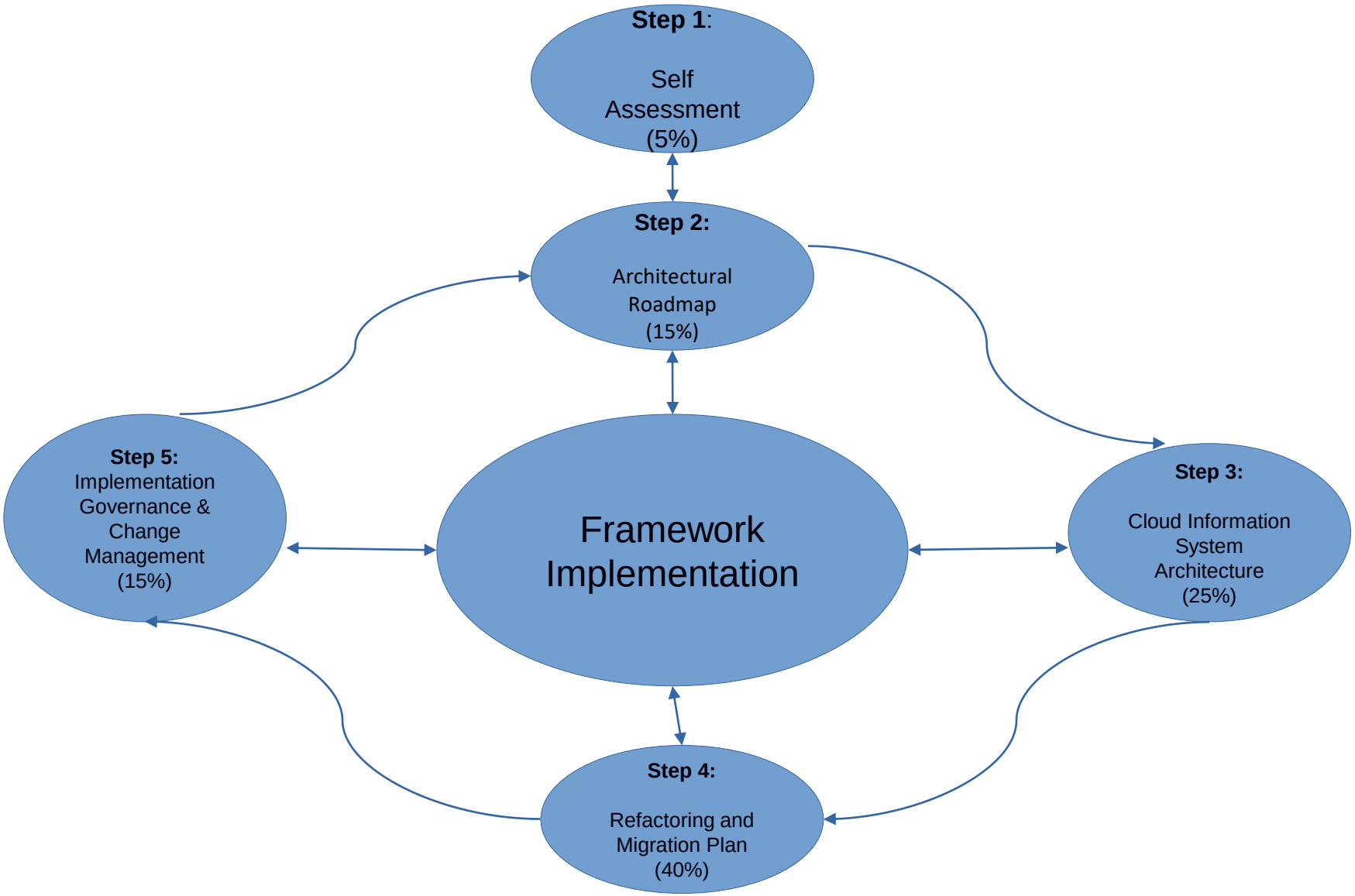
Framework Design (3)

Step 5:Implementation Governance & Change Management

Most organizations resist change and it is important to condition stakeholders for change. This step deals with user acceptance and managing the changes to the architecture over time.

Implementation Governance include drafting and implementation of usage policies,training strategies and getting feedback from stakeholders(mostly the students and the lecturers)

Implementation Matrix



Case Scenario

A small university has about 1000 students and 50 faculty members. The university's limitation is that they have limited IT infrastructure to conduct practical classes. Another challenge they face is difficulties in managing its administrative tasks The university decides to implement open source cloud services to address these challenges.

Solution

The university can use the OpenStack cloud platform to manage its administrative tasks. The university must define the scope of the architecture, identify stakeholders, and create a high-level architecture vision for the open source cloud infrastructure. Openstack can create a centralized database for storing student and faculty information, an email server for communication, a document management system for managing files, and a Moodle server to centrally manage online classes.

Conclusion

Implementing a framework for open source cloud services can provide numerous benefits, such as cost-effectiveness, scalability, and customizability.

However, it also comes with challenges, such as complexity and security risks.

To ensure a successful implementation, it's important to choose the right platform, plan your deployment, train your staff, monitor performance, and engage with the open source community.

By following **best practices** and regularly reviewing and updating the implementation framework, universities can maximize the benefits of open source cloud services and reduce their expenditure on ICTs.

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