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| University of Johannesburg ... |
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| **DEPARTMENT OF**  **APPLIED INFORMATION SYSTEMS**  **Information Systems Architectures (ISM8X03)** |
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**ISM8X03 LU3 Post-class Activity: Architects of Change: Designing Inclusive Digital Education Through Storytelling**

**Group Details:**

**ArchiMinds**

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| Surname & Initials | Student Number |
| SS. Makhoba | 222133036 |
| L. Maleka | 222018432 |
| T. Mahomet | 222155991 |
| P.M. Nedzamba | 222068962 |
| S.C. Ndlovu | 221003947 |
| K. Sekgobela | 222009983 |
| KT. Xaba | 222028581 |

1. **Introduction**

This document outlines the key Enterprise Architecture (EA) components illustrated in the storyboard, providing insights into the narrative choices made and their alignment with inclusive education design and business considerations. The architecture emphasizes accessibility, offline functionality, security, and integration to create an inclusive learning environment.

1. **EA Components Illustrated**

A. Capability Model

The storyboard highlights essential learning capabilities that ensure inclusivity and accessibility:

* Learning Management: Course creation, assessments, progress tracking, gamification, and offline learning support.
* User Management: Role-based access for students, teachers, and administrators with customizable user profiles.
* Communication & Collaboration: Discussion forums, messaging systems, and virtual classrooms to foster interaction.
* Content Management: A resource repository supporting multimedia elements to enhance engagement.
* Analytics & Reporting: Performance dashboards and custom reports to track progress and identify learning gaps.
* Accessibility & Inclusivity: Features such as multilingual support and offline access cater to diverse learners.
* Integration & Extensibility: Support for third-party tools and API integration for seamless expansion.

B. Technology Architecture

The system supports both online and offline learning, ensuring accessibility for students with limited internet connectivity:

* Offline Components: Progressive Web Apps (PWA), local storage, service workers, data compression, and offline data storage enable learners to continue their education without consistent internet access.
* Online Components: Cloud-based infrastructure with load balancing, role-based access control, smart data syncing, conflict resolution, AI-powered content management, and security measures including encryption and multi-factor authentication.

C. Data Architecture

A four-layered approach ensures efficient data storage and synchronization:

1. User Device (Offline): Stores learning content locally for easy access.
2. Local Storage: Maintains content accessibility within the user’s browser.
3. Sync Mechanism: Facilitates seamless data transfer when connectivity is restored.
4. Cloud Server: Provides centralized data storage for access across multiple devices.

D. Application Architecture

The application design prioritizes user experience, accessibility, and security:

* User Interface: An intuitive UI with accessibility features such as high contrast, dark mode, and voice commands.
* Offline Mode: Temporary data storage enables learning continuity during connectivity disruptions.
* Sync & Error Handling: Ensures smooth data synchronization and conflict resolution.
* Background Sync: Transfers data in the background when an internet connection is available.
* Cloud Server: Centralized storage for scalability and real-time data updates.

1. **Narrative Choices & Their Reflection on Inclusive Education**

The storyboard presents a compelling journey toward digital inclusion:

* Digital Divide & Accessibility: Thandiwe, a student in a remote village, struggles with educational access due to a lack of internet connectivity. This reflects the real-world challenge of the digital divide in underserved areas.
* Teacher's Concern & Community Initiative: A teacher highlights the need for internet connectivity, prompting action from a local technician who installs a router, symbolizing infrastructure improvements essential for inclusive education.
* Introduction of New Technology: The unveiling of new digital tools in the classroom amazes Thandiwe and her peers, showcasing the transformative power of technology in education.
* Empowerment & Community Impact: Thandiwe, now able to study at home using a tablet, represents the empowerment that technology provides. The expansion of connectivity to the entire community highlights the long-term benefits of inclusive digital education.

1. **Conclusion**

The EA components depicted in the storyboard showcase a well-structured approach to inclusive education. By leveraging offline capabilities, cloud-based technology, secure data management, and an accessible UI, the system ensures equal learning opportunities for all students, regardless of their digital access limitations. These architectural decisions create a scalable and resilient education platform designed for long-term success.

1. **Link to the contextual map**

Contextual map: <https://padlet.com/malekalethabo95/rural-students-in-eastern-cape-using-digital-education-1mtpulry3o123ou4>

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