



# National Strategic Implementation plan for using Cloud Computing in Education in Arab Countries



January 2018

**Objective : guide project teams from Arab countries in the elaboration of their own vision and national strategy for mass adoption of cloud computing in higher education.**

- The development of a vision and strategy for migration to the cloud requires a **structured approach** that takes into account different facets of cloud computing and the context in which Higher Education Applications' migration will be implemented.
- To meet such requirements, a **general model** of the Digital University (DU) as well as a **contextualization approach and tools** for designing and implementing the cloud migration strategy have been developed.

These tools are designed so that the main actors within the ministries and / or universities can, through **discussion** and **dialogue**, not only reduce / add elements composing these tools, but also review and update their degree of importance in acting on the weights.

This process is initiated by the contextualization of the tools that allow an **exchange based on the argumentation of the actors**. As a result, the process and the tools that underpin it bring views together and foster the emergence of a **shared vision and a consensus around goals**, their priorities, and the means to achieve them.

**This creates the right conditions for the acceptance, commitment, and involvement of the actors**

# **General Digital University Model**

# Digital University Vision and Strategy

Improve experience

Establish Brand

Control Costs

Increase Revenues

Deliver best outcomes

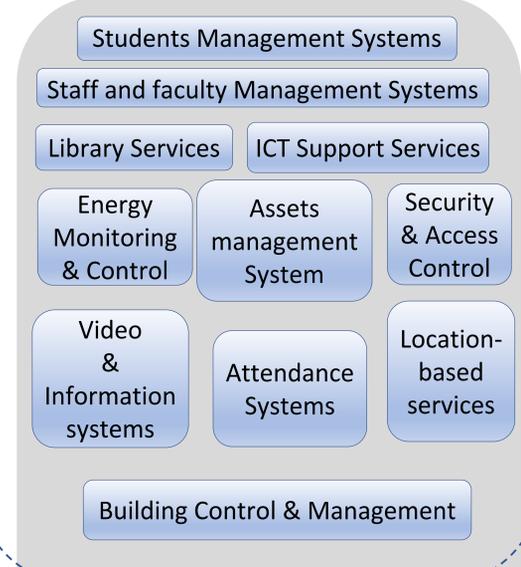
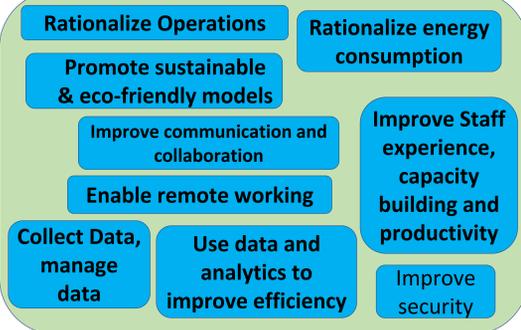
Promote Academic Values

Strategy Planning Service

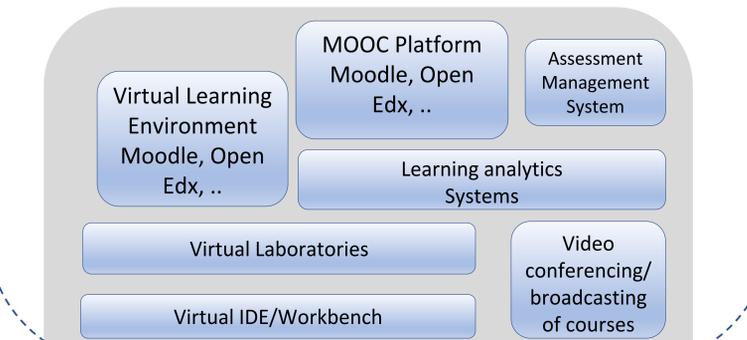
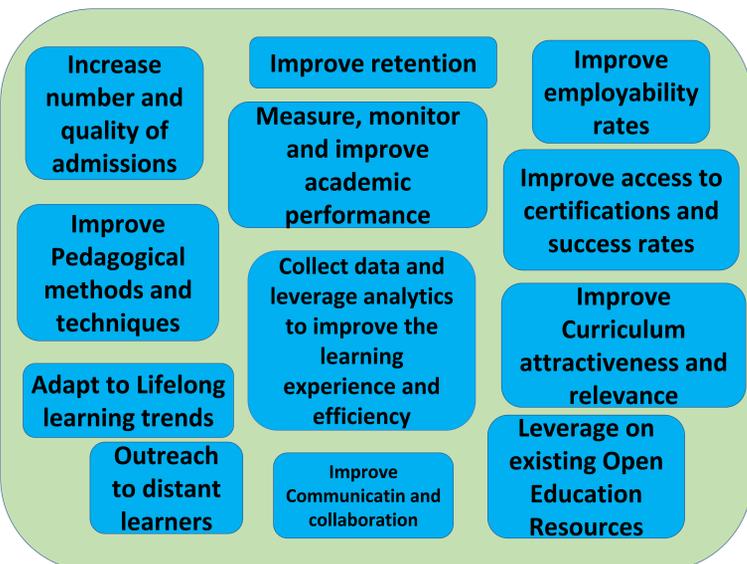
Strategic intelligence and analysis Service

Strategy Monitoring, KPIs, Dashboards Service

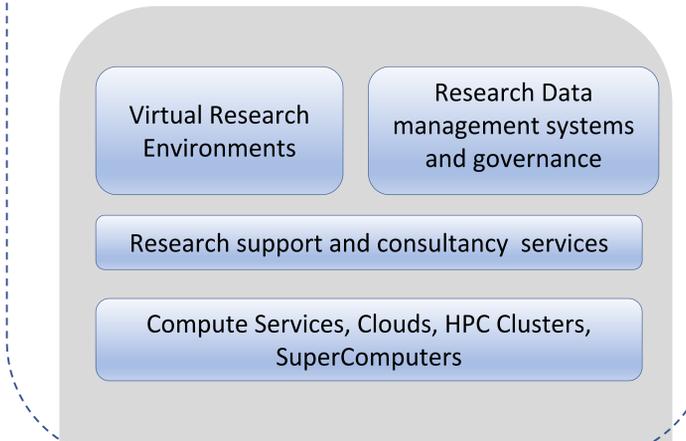
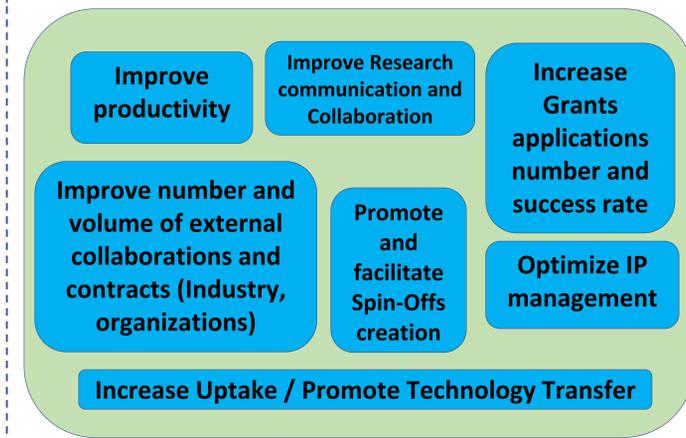
## Digital Campus Management



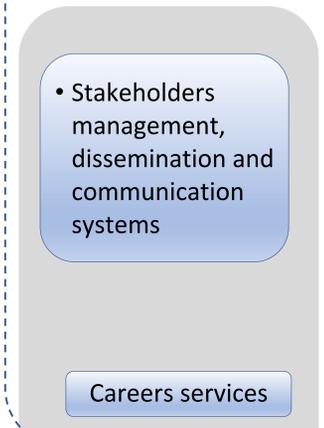
## Digital Teaching & Learning



## Digital Research



## Ecosystem links



Unified Communications  
Emails, Web Conferencing  
and Collaboration

Video Conferencing

Video Capture & Storage

Social Media Tools

Information Sharing Tools

University Portal

Storage services

Collaborative Office Suites

## Communication & Collaboration Services

## IT Service Delivery Platform, End-to-end infrastructure

Wired and Wireless Network

IoT Network

Secure Remote Access

Identity Federation

Data Center / Private Cloud

Brokers

Community Cloud

Public Clouds

# **Customized Digital University Model**



What IT applications contribute most to achieving the selected objectives?

<http://bit.ly/bahrain-oapp>

# **Three-layered decision making model**

# Ministry-driven strategy

## Ministry Objectives and Applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2, DU1-OBJ3 } { DU1-APP1, DU1-APP2}
- Digital Teaching & Learning: { DU2-OBJ1, DU2-OBJ2 } { DU2-APP1, DU2-APP2, DU2-APP3}
- Digital Research: { DU3-OBJ1 } { DU3-APP1, DU3-APP2}
- Ecosystem digital links: { DU4-OBJ1, DU4-OBJ2 } { DU4-APP1}



University strictly follows Ministry strategy

## University Objectives and Applications derived from Ministry Objectives and Applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2, DU1-OBJ3 } { DU1-APP1, DU1-APP2}
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Institution strictly follows University strategy

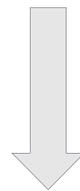
## Institution Objectives and Applications derived from University Objectives and Applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2, DU1-OBJ3 } { DU1-APP1, DU1-APP2}
- Digital Teaching & Learning: { DU2-OBJ1, DU2-OBJ2 } { DU2-APP1, DU2-APP2, DU2-APP3}
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# Ministry enforces subset of common objectives and applications University defines subset of specific objectives and applications

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University follows Ministry strategy and defines its own strategy adapted to its specific context.

## University Objectives and Applications derived from Ministry Objectives and Applications and adds specific new objectives and applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2, **DU1-OBJ3** } { DU1-APP1, **DU1-APP2** }
- Digital Teaching & Learning: { DU2-OBJ1, **DU2-OBJ2** } { DU2-APP1, **DU2-APP2, DU2-APP3** }
- Digital Research: { DU3-OBJ1 } { DU3-APP1, **DU3-APP2** }
- Ecosystem digital links: { DU4-OBJ1, **DU4-OBJ2** } { DU4-APP1 }



Institution strictly follows University strategy

## Institution Objectives and Applications derived from University Objectives and Applications

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- Ecosystem digital links: { DU4-OBJ1, **DU4-OBJ2** } { DU4-APP1 }

**Ministry enforces subset of common objectives and applications**  
**University defines common subset of specific objectives and applications**  
**Institution defines extra subset of specific objectives and applications**

### Ministry Objectives and Applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2 } { DU1-APP1 }
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University follows Ministry strategy and defines its own strategy adapted to its specific context.

### University Objectives and Applications derived from Ministry Objectives and Applications and adds specific new objectives and applications

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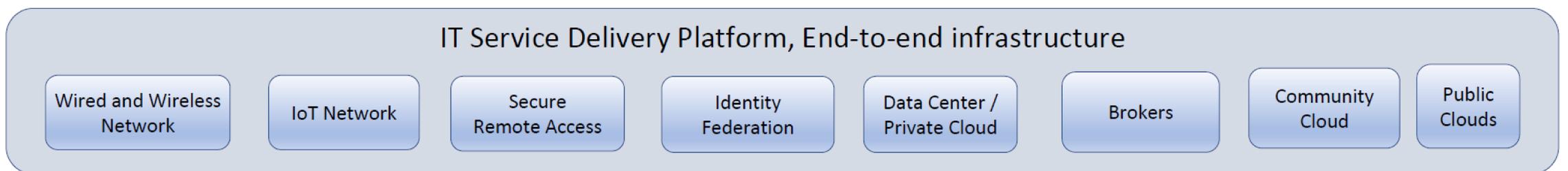


Institution follows University strategy and defines its own extra strategy adapted to its specific context

### Institution Objectives and Applications derived from University Objectives and Applications

- Digital Campus Management: { DU1-OBJ1, DU1-OBJ2, **DU1-OBJ3** } { DU1-APP1, **DU1-APP2, DU1-APP3** }
- Digital Teaching & Learning: { DU2-OBJ1, **DU2-OBJ2, DU2-OBJ3** } { DU2-APP1, **DU2-APP2, DU2-APP3** }
- Digital Research: { DU3-OBJ1, **DU3-OBJ2** } { DU3-APP1, **DU3-APP2, DU3-APP3, DU3-APP4** }
- Ecosystem digital links: { DU4-OBJ1, **DU4-OBJ2** } { DU4-APP1 }

# Contextualized IT Service Delivery Platform layer



# Contextualized SWOT Analysis

- The four dimensions of SWOT are defined as follows:
- **Strengths** :characteristics of the project that give it an advantage to achieve objectives
- **Weaknesses** :characteristics of the project that place it at a disadvantage for achieving objectives
- **Opportunities** :elements in the environment that the project could exploit to its advantage
- **Threats** :elements in the environment that could cause trouble for the project

• <http://bit.ly/bahrain-swot>

## SWOT ANALYSIS



# Contextualized vision for IT governance

# Critical factors and migrability level identification

<http://bit.ly/bahrain-factors>

# Building migration & Implementation strategies

Translate objectives into operational plans and programs by choosing the cloud style, type and provider, and by defining sub-objectives, activities, sub-activities to be implemented and by identifying the resources to be allocated and the teams to be deployed.

<http://bit.ly/bahrain-migration>

# Typical migration scenarios

## **Scenario 1, Migration to a private cloud with OpenStack**

Its objective is to deploy a legacy Students Management System on an OpenStack-based private cloud

## **Scenario 2, Migrating Moodle to AWS**

Its Objective is to deploy a Virtual Learning Environment / LMS based on Moodle on Amazon's public cloud

## **Scenario 3, Migrating Research Computing Services to the cloud using a cloud broker, AWS, Azure and Google Cloud Platform (GCP)**

Its objective is to deploy a Cloud broker and a collaboration portal to access compute and storage capabilities for research on AWS, Azure, GCP and Open Nebula-based research cloud in order to provide each researcher and each PhD student with a managed /monitored personal public cloud account

# Typical migration scenarios

## **Scenario 4, Migrating SharePoint-based portal to Azure 365**

Its objective is to **deploy** a Stakeholders management, dissemination and communication portal/CMS based on Microsoft SharePoint on Azure.

## **Scenario 5, Migrating communication and collaboration services to G Suite for education**

Its objective is the use G Suite for education for communication (GMAIL, HANGOUTS)

Collaboration (G Docs) Courses management (G Classroom) and cloud computing/big data education.

The migration of universities to the cloud is not limited to its technological dimension. It involves a set of actors including decision makers, beneficiaries and teams involved in the implementation of change.

The latter is to be interpreted as a **dynamic process of material and immaterial transformations**, including the **culture** of the university.

This process is part of a **proactive** strategy of permanent renewal with regards to technological evolutions and modes of work and collaboration.

The success in migrating to the cloud in Higher Education is conditioned by the adoption of a **participatory approach** that puts emphasis on the development of the university's capacity to change and adapt. It is essential to conduct and steer change in a way that enables the **greatest autonomy** of the different actors while respecting key **guidelines** and preserving core strategic objectives.