Jordan Ministry of Higher Education and Scientific Research Smart Education Project

Unlocking Knowledge — Everywhere, for Everyone

I.Basic Information of the Project

Today, education is ever-more personalized, ever-more hybrid. With new digital models emerging across the board — in classrooms, research labs, and administrative offices — intelligence and the vitalization are increasingly critical, supported by fresh innovations in Information and Communications Technology (ICT) that are utterly transforming the education industry. Digital transformation is vital for transforming the education sector in Jordan, ensuring accessibility, quality, and relevance in the face of technological advancements. Globally, there are 120+ Countries and regions, 25,800+ Universities and research institutes, 3500,000+ Primary and secondary schools which benefit from the new ICT solution.

This time will start the Jordan Smart Education Project, the assistance of the project is to help the 10 most important Jordanian public universities build a smart education system, help them share high quality education resources, facilitate students' learning, and improve teaching quality. In the future, the system can be opened to more colleges and universities and the public to learn the latest scientific knowledge.

II.Project Justification

The education of Jordan has always been the most important government mission for people's livelihood. How to improve the quality of teaching more effectively and make it easier for students to obtain the latest scientific knowledge has always been a concern of His Majesty King Abdullah II and the Ministry of Higher Education and Scientific Research.

Through this project, MOHE can quickly build an education platform, share high-quality education resources, improve students' learning efficiency, and enable students to have a more cutting-edge technical vision and research environment to stand out in competition.

III.Project Details:

The project cost is estimated to be 9 million JOD, to start education digitalization solutions

designed to enhance the backbone education network, streamline education platforms, implement intelligent smart classroom applications, and establish efficient smart campus. The details are as follows:

Item	No.	System or solution	Sites
Data Canter	1	Cabinet and Aisle System	For 1 site
	2	Power Supply and Distribution System	
	3	Cooling System	
	4	Fire Extinguishing System	
	5	Monitoring System	
Education Platform for MOHE	1	Software- Live broadcast system	For 1 site
	2	Software- Student license	
	3	Management System	
	4	All network equipment is included such as (core switches, routers, firewalls and cables)	
	5	Storage Solution with licenses	
	6	Server Solution	
	7	Local Backup and disaster recovery solutions	
Intelligent recording and broadcasting host	1	Small DC center	10 sites
	2	Server solution	10 sites
	3	Storage Solution	10 sites
Network Management, Control, and Analysis System	1	Campus Management System	1 Site
Passive Ethernet All-Optical Network	1	Firewall for Aggregation Site in University	10 Site
	2	Access Router for Aggregation Site in University	10 Site

	3	PEN Core Switch	10 Site
	4	PEN Aggregation Switch	100 Building
	5	PEN Edge Access Switch	1000 Classrooms
	6	WiFi for each room	1000 Classrooms
Smart classroom	1	Smart classroom Solution	1000 Classrooms
Training	1	20 Persons	

1. Data Center: Data center ((Tier3) >60 m ^{2})

1.1 Module Datacenter (MDC)

Dual-Row Smart MDC adopts Allan-Room construction mode and medium data center integrates cabinets, power supply and distribution system, cooling system, monitoring system and integrated cabling system.

MDC can install directly on cement ground without raising floor to reduce site engineering. It mainly adopts 1200mm cold/hot aisle containment

1.2 Power Supply and Distribution System

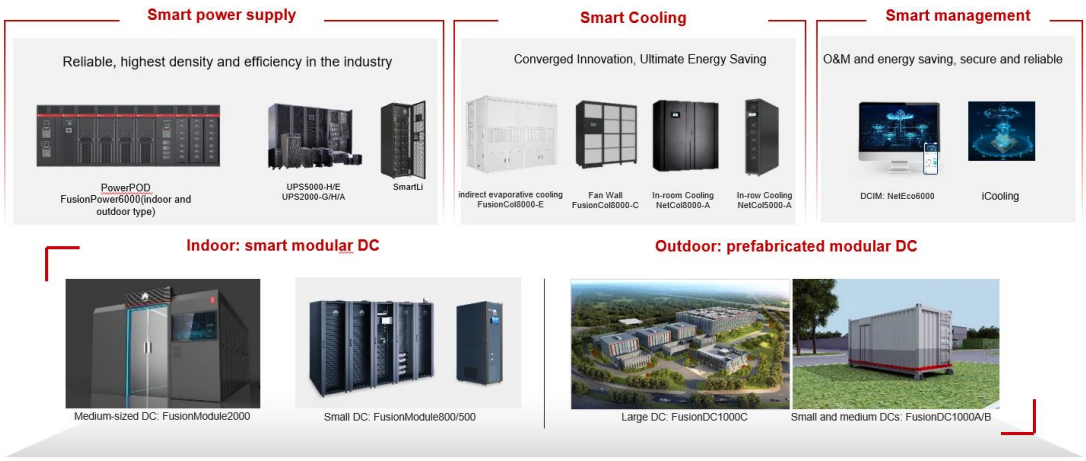
The integrated UPS cabinet has the following features. Uses a unified architecture, and provides reliable quality, comprehensive functions, and consistent appearance. Integrates an ATS or MCCB and components for distributing power to IT equipment, air conditioners, lights, and UPSs, N+1 Houses 50 kVA power modules.

1.3 Cooling System

NetC015000-A 25kW, the cooling system adopts air-cooled in-row precision air conditioners and the aisle containment as a cooling method. The air-cooled in-row precision air conditioners and equipment cabinets constitute an aisle containment to separate cold air from hot air, as shown in the following figure.

In-row air conditioners are close to heat sources, which shortens the air supply distance, reduces airflow pressure loss and cold air loss, and maximizes the use of cooling capacity.

Figure 1-1 Smart Modular Data Center



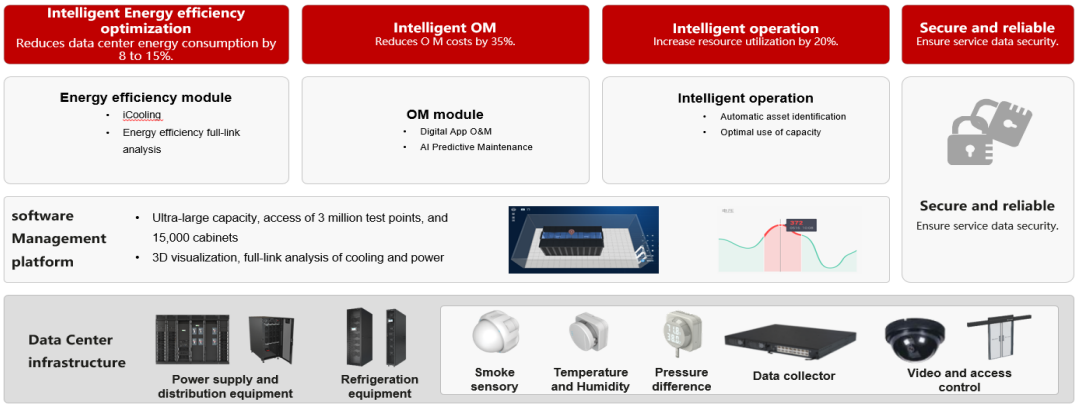
1.4 Fire Extinguishing System

The Data Center should provide corresponding fire automatic alarm system and fire extinguishing system. Inner equipment room should configure smoke sensor, temperature sensor and gas fire extinguishing system or other permissible fire extinguishing systems

1.5 Monitoring System

The management system consists of the management software and other components, ensuring data collection and management for data center infrastructure. With a flexible structure and modular design, the system can manage infrastructure of a single data center or manage infrastructure of multiple data centers in different regions in a centralized manner.

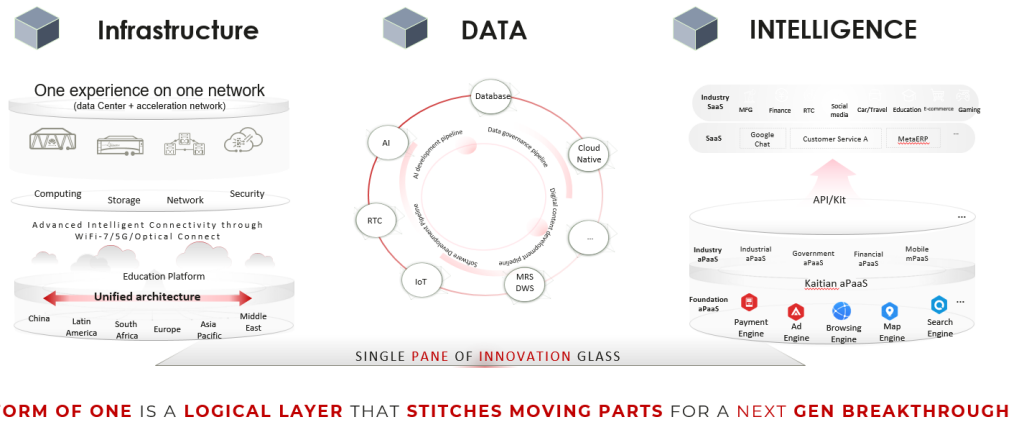
Figure 1-2 Data Center Management System Product Panorama



2. Education Platform

Education platform is designed to empower educational institutions with scalable and secure services. MOHE education platform provides you with secure, stable, quality services whether you are an online education organization or training organization. And the platform also breaks the boundaries of time and location and allows students to learn anytime, anywhere through services such as Video on Demand (VOD) and Live Broadcast. Learners can enjoy a new learning experience provided by intelligent.

Figure 1-3 Platform of One the New Era of Education Intelligence



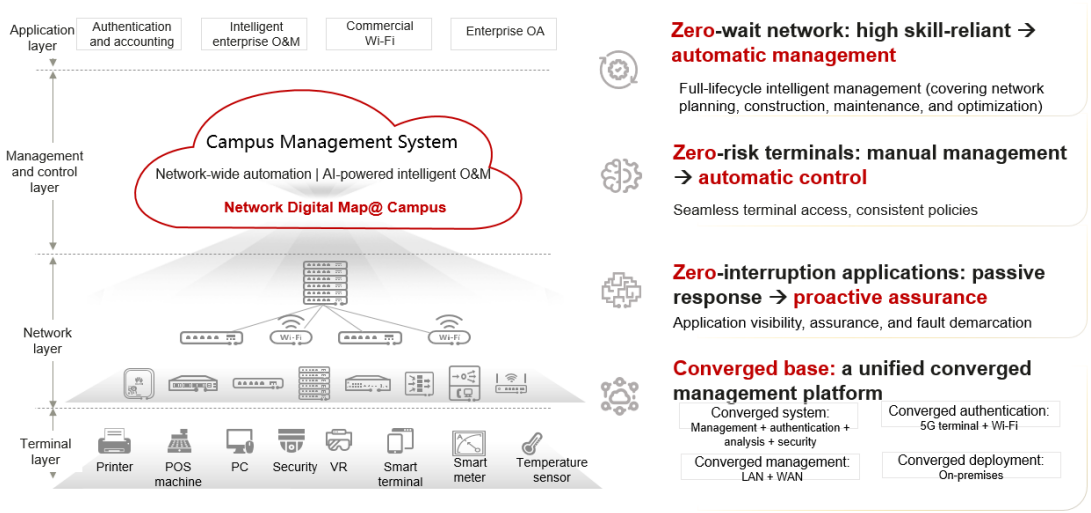
PLATFORM OF ONE IS A LOGICAL LAYER THAT STITCHES MOVING PARTS FOR A NEXT GEN BREAKTHROUGH

3. Network Management, Control, and Analysis System

The autonomous driving network management and control system for campus networks — integrates management, control, analysis, and providing full-lifecycle automation of campus

networks. Intelligent fault closure is also implemented through network digital maps, big data analytics. Helping enterprises reduce both Operating Expenditure (OPEX) and Operations and Maintenance (O&M) costs, it accelerates enterprise cloudification and digital transformation by achieving automated and intelligent network management.

Figure 1-4 Network Management Platform



4. Passive Ethernet All-Optical Network

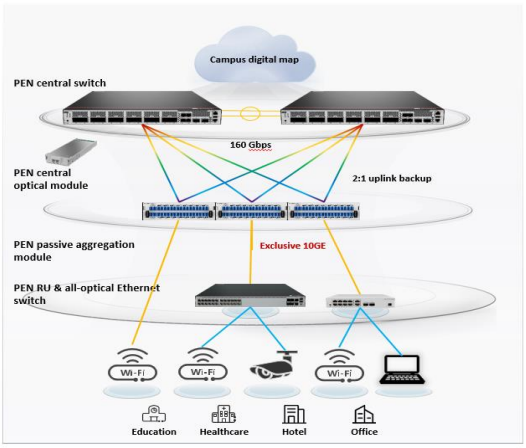
The Passive Ethernet All-Optical Network compared with the traditional three-layer network architecture that consists of the core layer, aggregation layer, and access layer, the new architecture consists only the core layer and access layer. Terminals can flexibly access the network through the closest RU, and no more intermediate nodes are required, saving the deployment of massive Ethernet cables and greatly reducing network construction costs:

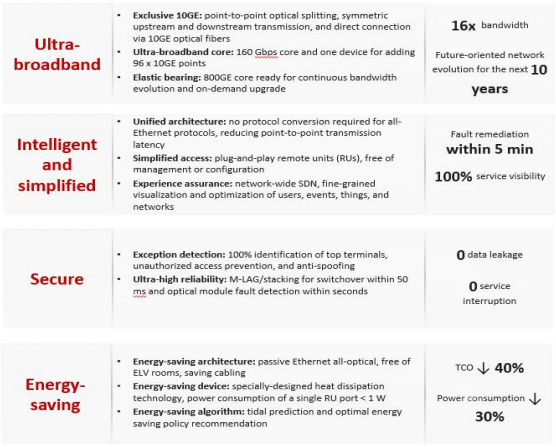
Simplified deployment: The entire network is automatically deployed; RUs are configuration-free.

Simplified O&M: O&M information is centrally collected, implementing device and port visualization. In the PEN Solution, passive aggregation modules do not require power supply, and there is no active device in ELV rooms, almost free of O&M.

Simplified access: Flexible power supply enables access at a long distance of over 300 m. Intelligent connectivity of everything is supported, with parameters automatically negotiated.

Figure 1-5 Passive Ethernet All-Optical Network

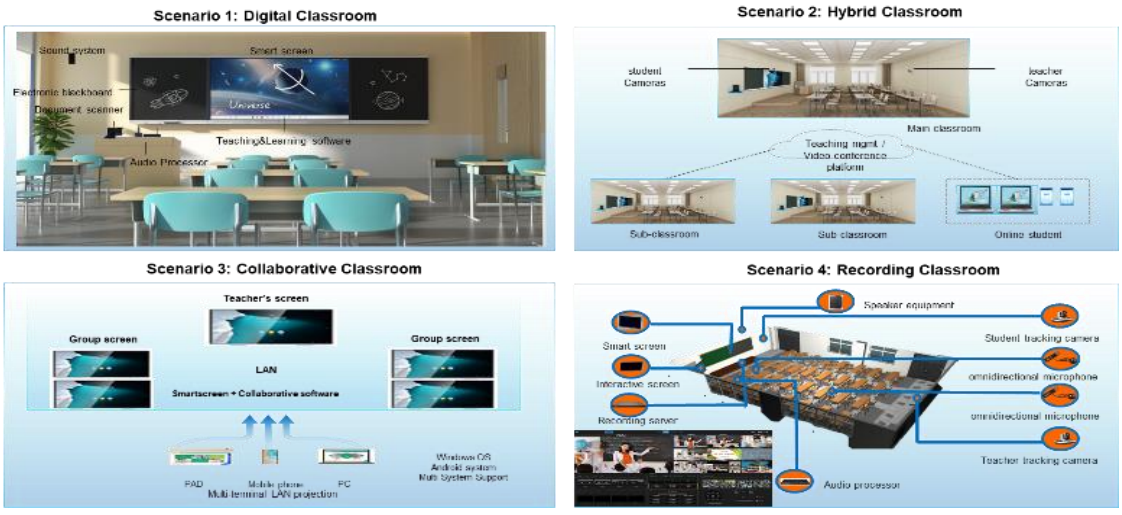




5. Smart Classroom

Smart education aims to use ICTs to provide innovative teaching, management, research, and services to better train talent. Classrooms are the main teaching scenarios and an important part of smart education. Traditional classrooms are restricted by blackboards and fixed locations, and more often adopt the cramming teaching mode. As a result, smart classrooms are emerging. The smart classroom integrates various resources and provides multiple teaching tools to provide high-quality learning experience, facilitate communication, collaboration and sharing, and ultimately achieve innovation in teaching methods.

Figure 1-6 smart classroom

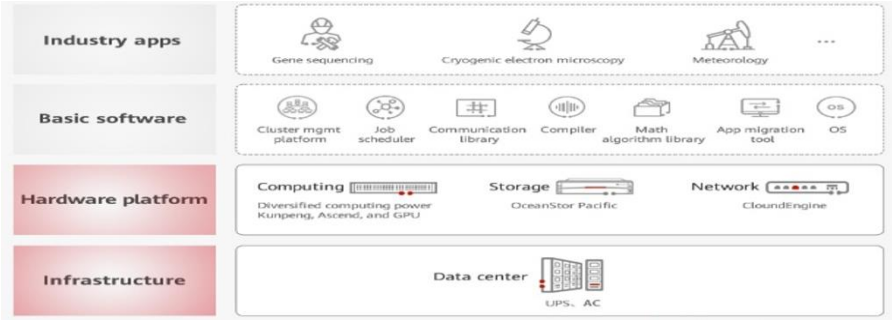


6. Scientific Research High Performance Data Analysis (HPDA)

Scientific Research HPDA Solution provides users with differentiated ICT infrastructure that meet the data requirements of diverse research in different disciplines. The distributed storage

system adopts an ultra-high-density design — both in terms of capacity and performance — to make significant savings in equipment room space, bringing down the Total Cost of Ownership (TCO). The parallel file system supports large bandwidth and high Input/Output Operations Per Second (IOPS), effectively addressing the challenges of hybrid workloads. POSIX/NFS/CIFS/HDFS/S3 multi-protocol lossless interworking helps users solve data conversion problems between different business systems.

Figure 1-7 Scientific Research HPDA



7. In Summary:

Above comprehensive digital transformation steps aim to modernize the education sector in Jordan, fostering a dynamic and inclusive learning environment. Through strategic initiatives and collaborative partnerships, Jordan can position them at the forefront of educational innovation, ensuring that all students have access to high-quality, technology-enhanced education.

IV. Additional Considerations

This project requires an empty room, preferably on the first floor, with an estimated size of 60-80 square meters. It is used for cabinet deployment in the data center.

Local integrator partners will do the delivery of the entire project with vendor supports. The overall project delivery period is expected to be about 10 to 12 months. The data center production, transportation, and deployment period are about 6 months. The remaining education platform, smart classroom, and network deployment period is about 4 to 6 months.

V. Subsequent Operation and Maintenance

After the project is delivered and accepted by the user, all equipment and systems will be

handed over to MOHE and end users.

This project will provide a 20-person training to help the maintenance and configuration teams of MOHE and end users to quickly learn how to use the entire system.

In this project, Vendor will provide at least 3 years warranty and local onsite service to make sure all business will be running stable.