Implementing an opensource Higher Education and Research ERP at the scale of a country or State.

Case Study : The Malian Higher Education Information System

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Plan

Introduction to the ERP "Cocktail"

The Malian MESRS ERP project

- The Context
  - The Republic of Mali
  - The requirements
  - The tender

Implementation

- The first phase 2014 – 2015
- The second phase 2015 – 2018
- Achievements

Work in progress

Perspectives

Conclusions

Anyone for a Cocktail ?

In the beginning: 1983-1993

- In-house development for La Rochelle Technical College, SW France.

- Founding concepts:

  - Consortium of universities and higher education establishments.

  - Opensource GNU-GPLv3 license.

  - A central, single, shared & secure data repository "GHRum".

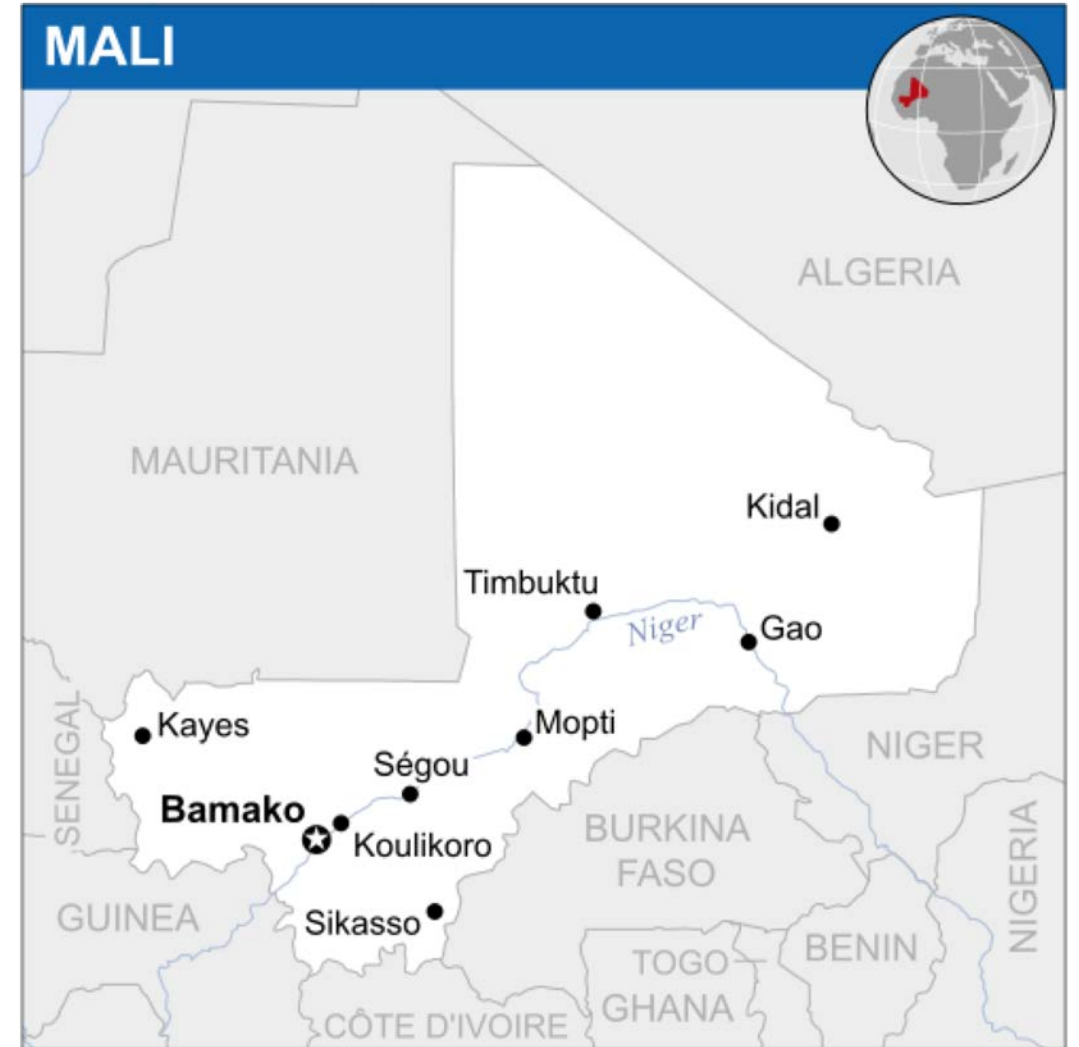**NeXtstep: 1993-2011 : ERP Cocktail**

- Chosen as the SIS for the newly founded La Rochelle University in 1995.

- A community of developers and contributors.

Anyone for a Cocktail?

2011:"Fork"

- Cocktail association
- Cocktail Office

2011: SIS/ERP Cocktail+

- Redevelopment
- Full web services
- Responsive design
- DBMS independent
- Multi-Institutions

The ERP Cocktail is now used in over 80 French higher education institutions

The Malian Higher Education Student Information System Project

The Republic of Mali

Country context

Republic of Mali
Capital: Bamako

Population 18.5 million

Area 1.25 million sq km (482,077 sq miles)

Major languages French, Bambara, Berber, Arabic

Religions Islam, indigenous beliefs

Life expectancy 57 years (men), 84 years (women)

Currency CFA (Communaute Financiere Africaine) franc

UN, World Bank

LEADERS

President: Ibrahim Boubacar Keita

- 1960 Independence (ex French Sudan)
- Ranked 183rd out of 188 countries[*]
- Unemployment rate (2004 est.): 30 %
- Population below poverty line (2005 est.): 36 %
- Growing radical Islamist terrorist threat
- Internet access[**]; expensive, low bandwidth, poor cover
- "paper based culture " administration and Gov.

[*] 2018 United Nations Human Development Index 2018

[**]situation in 2014

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The Malian Higher Education system context

- Ministry of Higher Education and Scientific Research (MESRS)

- 12 higher education public institutions + the MESRS
  - 5 universities + 7 engineering / business schools

- Approx. 100,000 students

- 3,500 staff with approx. 3,000 civil servant status

- Between 25,000 and 30,000 undergraduates per year

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The Malian Ministry of Higher Education and Scientific Research - SIS Project

The Challenges :

- Since 2011 an in-depth reform and system overhaul undertaken.

- Ambition to improve internal and external efficiency.

- Implement the Bachelor, Master and Doctorate (BMD) curriculum throughout the country's higher educational institutions.

- Implement a student management information system to improve management, administration and efficiency, both at Ministerial level and at local, institutional levels.

- Facilitate university admissions and enrolment for undergraduates

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The scope of the MESRS' requirements

- Deploy a student information system (SIS) at a national scale.

- Modernise the courses offered by institutions.

- Facilitate admissions and enrolments for undergraduates

- Implement the Bachelor-Master-Doctorate curricula framework.

- Offer a centralized management system to facilitate administration at a national level (Ministry) and local (institution).

- Scale the solution to absorb bulk online enrolment and admission workflows.

- Offer accessible online digital work space and services to students & staff.

- Include Financial, Human Resources, Estate and Research management packages.

2014 : Public tender for procurement NICHE/MLI/215
"Modernization and professionalization of eight institutions of higher education in Mali"

A capacity development plan encompassing the following interrelated building blocks:

1. Governance
2. Quality Assurance
3. ICT (subdivided into 3 sub-components)
   3.1 ICT policies and strategies for the sector (national level; organisation level)
   3.2 SIS (introduction of a global ERP/SIS throughout the whole system)
   3.3 ICT use in education
4. Distance learning (e-learning)
5. Gender
6. Labour Market

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And the winner was:

A multinational consortium led by CINOP Global (NL)

- Association of African Universities (Ghana)
- CINOP Global (The Netherlands)
- Cocktail-Office (France)
- Claude Bernard Lyon 1 University (France)
- Yes Inc. Mali (Mali)

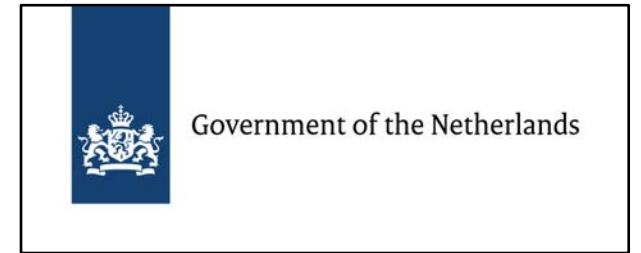# Project funding

Global 3M€ project over 4 years (2014 – 2018).

- 450K€ allocated to the higher education information system.
- Funding from the Government of the Netherlands.
- Funding from the World Bank through the project PADES.

Beneficiaries:

- The ministry of higher education and scientific research (MESRS).
- 9 public higher education institutes.
- The inter-university ICT resources centre (CIRN).

Additional funding:

- 30K€ French Embassy.
- 150K€ World Bank for additional developments.
- 150K€ Government of the Netherlands for a 1 year extension.

The Project
Building block 3.2:
Implementing the Student Information System

Project duration 2014 to 2019
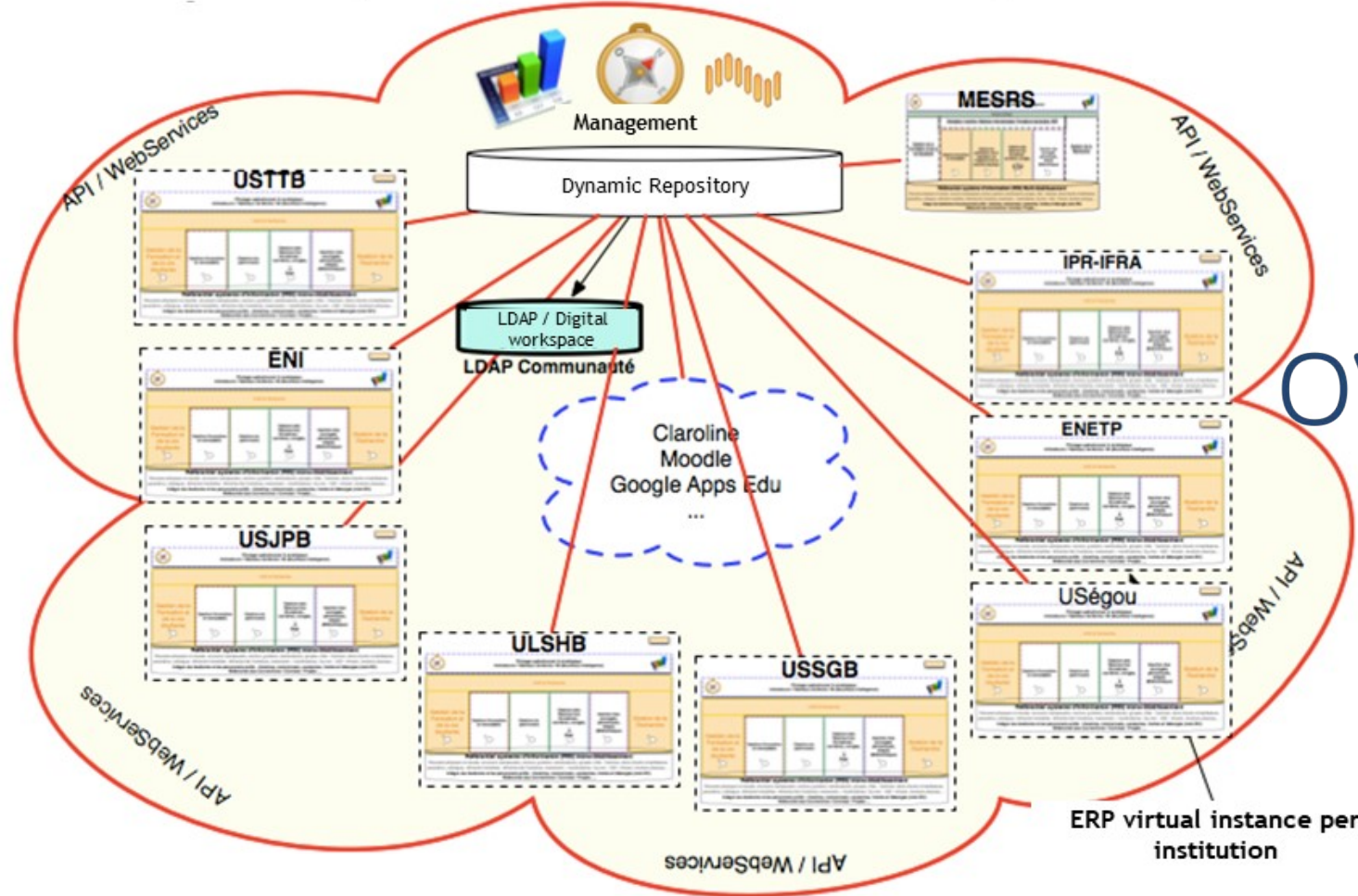
The first phase: 2014 - 2015

Challenge :
Deadline end of August 2015, to enable 19,000 new undergraduates to enrol online.

- Kick-off meeting 2nd November 2014.

- Survey to define design requirements.

- Database and data repository design.

- Proposal for a POC.

- Onsite project management (Agile) with meetings and training sessions.

- Software development over a 10 month period.

- The ERP infrastructure was outsourced into a private cloud hosted by the French company OVH.

- Infrastructure administration and maintenance outsourced to

  Cocktail-Office.

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A multi-instance, multi-institution architecture

Cocktail+
A Student Information System - A multi-establishment cloud with single administrative control
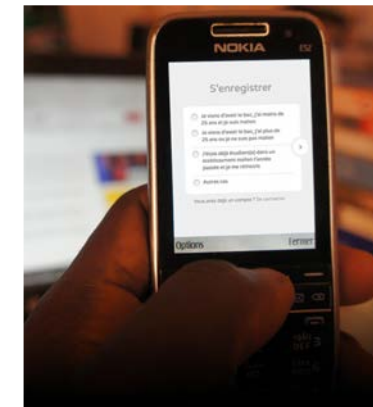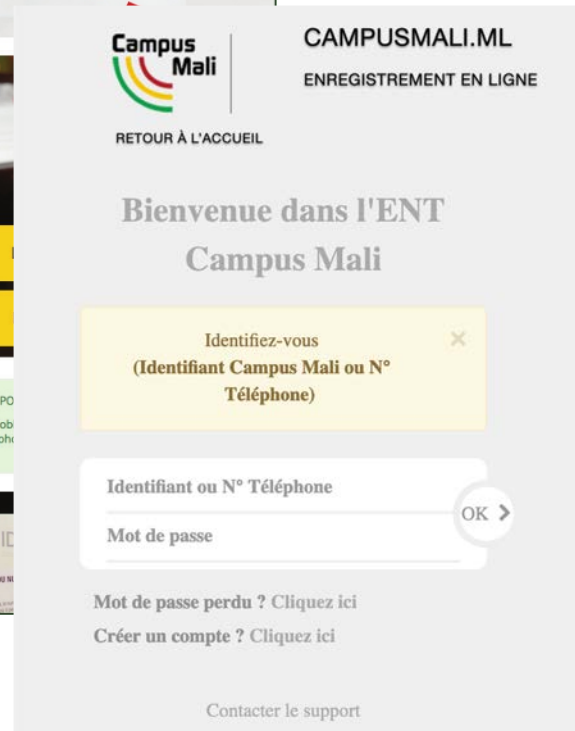
But it wasn't without difficulties...

- MESRS goals not fully understood or shared by stakeholders.

- All institutions had to be involved simultaneously.

- Difficulty in comprehending the end benefits.

- Proposal for a POC not retained.

- Limited Internet access public and local LAN (Wifi).

- Resistance to change (that's universal ☺).

- Geopolitical situation of the country.

... but it was a Success! 🤭

On the 16th of September out of estimated 19,000 undergraduates, 15,000 were pre-enrolled using the CampusMali admissions portal

The 2ⁿᵈ Phase 2015 - 2018

Technical issues:

- Further software developments, functional adaptations and extensions

- Batch retroactive bulk enrolment

Administrative issues:

- Scholarships only be paid to students who enrolled using the portal.

Human resources issues:

- Skills transfer to local administrative and technical staff

- Creation of a national support center

Political issues:

- Choice to insource the ERP datacenter and infrastructures

Achievements for the MESRS

- Creation of a responsive design portal www.campusmali.ml

- Real time data monitoring for the MESRS

- Global authentication LDAP/CAS

- Real time student directory

- Potentially 80,000 students and 3,500 staff access to digital workspaces

- Bulk or individual registration and pre-inscriptions

- Integrated on line payment management

- Staff email firstnames.name@mesrs.ml

- Production of dashboards, analytics, reports and KPI analysis from central data repository

- Reduce the possibility of fraud (scholarships)
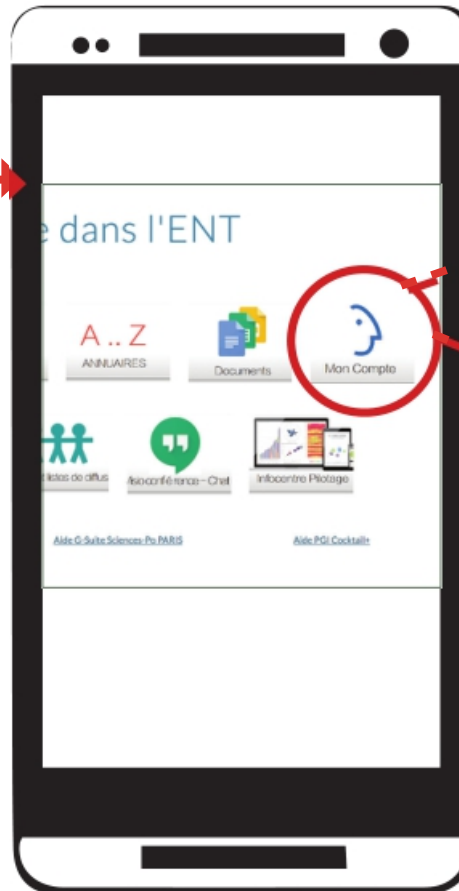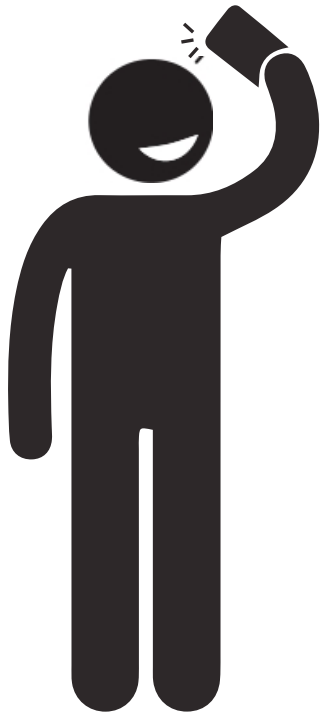
Benefits for the students

- Webservices available 24/7/365:

  - Pre-enrolment, enrolment, registration, choice of university

  - Curriculum options

  - Online diary with SMS message alerts

- Unique student ID, SSO with login or mobile phone number

- Student email firstnames.name@campusmali.ml

- Online payment "mobile money", no cash transactions

- Integration of Google Apps Edu software suite

- Access to unified digital workspace

- "Selfie" photo and certified trustworthy student ID card

- …

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A selfie as your photo for your student ID card

1. take your picture

2. Integrate it directly into your secure digital workspace profile

3. It will serve in your account and in your documents (student cards, diplomas, etc...)

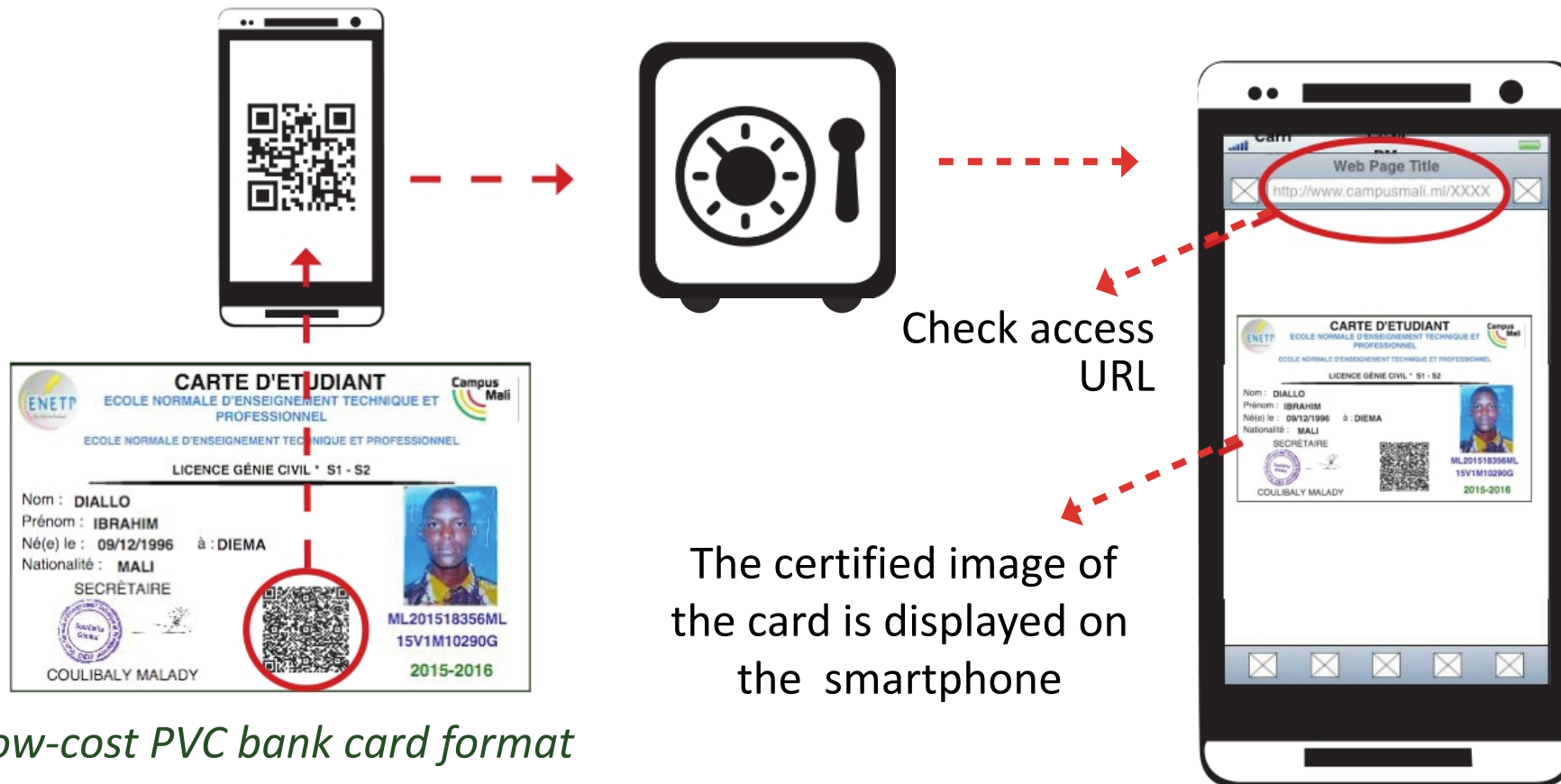EUNIS 2019
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A student ID card economic, trustworthy and connected

1. QR Code reading

2. Secure login URL to the ERP's digital vault

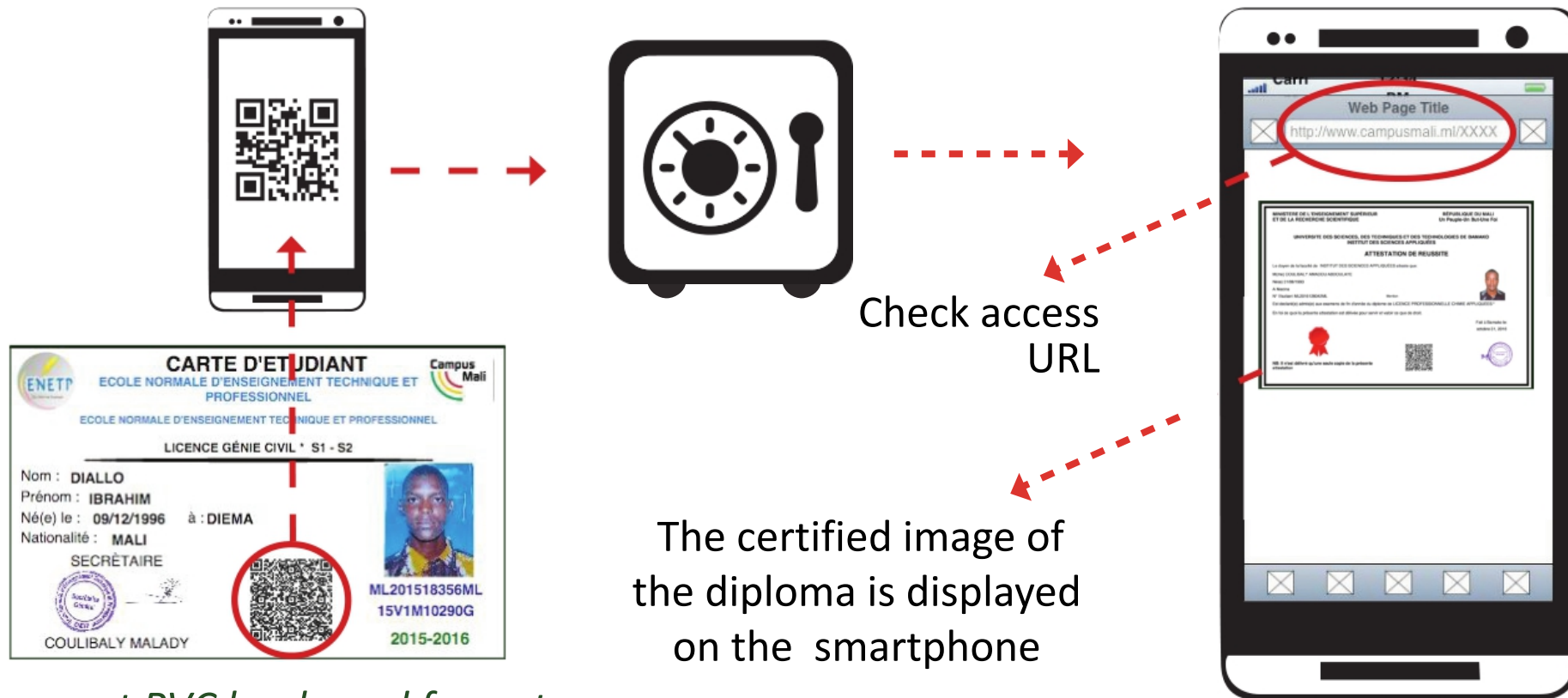3. Download the SIS/ERP student card to smartphone

Check access URL

The certified image of the card is displayed on the smartphone

A low-cost PVC bank card format card without expensive accessories

Trustworthy diplomas and certificates available online

1. QR Code reading

2. Secure login URL to the ERP's digital vault

3. Download the SIS/ERP student card to smartphone

Check access URL

The certified image of the diploma is displayed on the smartphone

A low-cost PVC bank card format card without expensive accessories

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Work in progress

NICHE/MLI/215: End of project 31st August 2019

- Convince all the institutions to adopt the ERP as a MIS.

- Transfer skills to local teams – onsite expertise for 6 months.

- **Extend the ERP to high schools, secondary, and eventually primary schools allocating a unique edu-ID for the student's complete education life-cycle (IQRA World bank funding).**

And also :

- Incorporate language internationalization capability (English and Arabic).

- Adapt the ERP to incorporate the education system of African Anglophone countries.

Perspectives

- ERP Extension to include timetables / diaries / Google calendar / classroom occupation

- Extend the ERP to CAMES* Francophone member countries;

  - Actually working in Senegal, on test in the Ivory Coast and Tunisia.

- Adapt HR package for staff career and leave management;

  - Specific local federal laws & regulation compliancy

- Extend accounting and finance packages to include global activities;

  - Specific local federal laws & regulation compliancy

- Develop research and laboratory management modules

* African and Malagasy Council for Higher Education

Conclusions

- A challenge and a success!
- An integrated opensource SIS/ERP has been implemented at a national scale.
- A Multi-instance, multi-establishment ERP based upon a single shared, secure data repository.
- Automated software deployment of a SIS/ERP "à la demande".
- A solution with minimal CAPEX-OPEX.
- Don't underestimate the training and skills transfer issues
- Don't underestimate political issues.

Merci beaucoup!

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