NRC·CNRC

Design Elements in a Personal Learning Environment

Stephen Downes

March 5, 2015

Fourth International Conference e-Learning and Distance Education
2 - 5 March 2015
Innovative Learning ... Promising Future
THE RITZ-CARLTON, RIYADH

المؤتمر الدولي الرابع للتعلم الإلكتروني و التعليم عن بعد
11 - 14 جمادى الأول 1436 هـ / 2 - 5 مارس 2015 م
تعلم مبتكر .. لمستقبل واعد
الرتز كارلتون – الرياض

The Problem:
The Skills Shortage in Canadian Industry

- Canadian Oil and Gas (O&G) sector loses $4 billion per year due to skills shortages.
- Skilled and professional unemployment rate less than 1%.
- Training current and prospective employees time-consuming and expensive.

The Solution:
Personal Learning and Performance Support

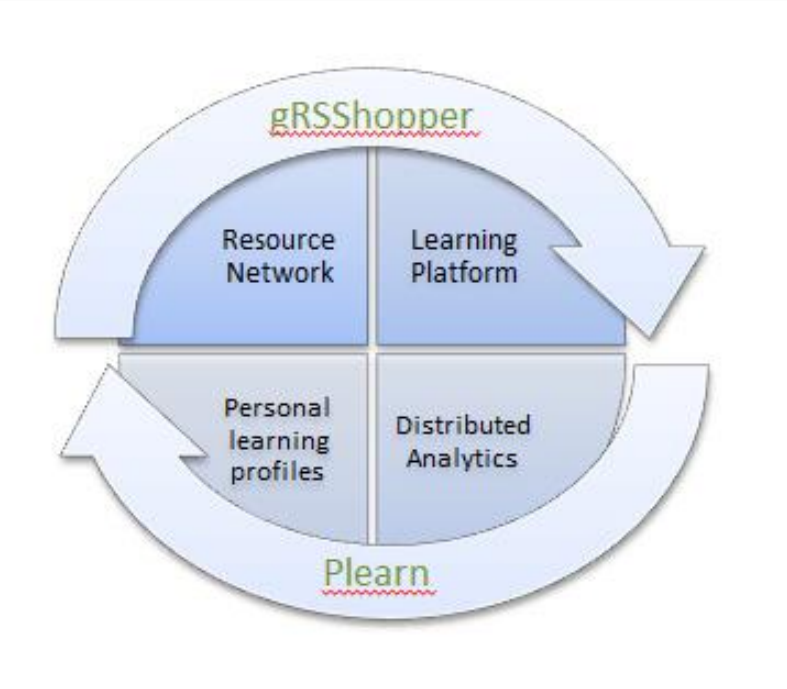
Single point of access to all skills development and training needs

- Individual learning path
- Context-aware support
- Searchable and verifiable
- Tailored to industry needs
- Always available
- Point of need performance support

Why NRC? Our Distinct Leverage

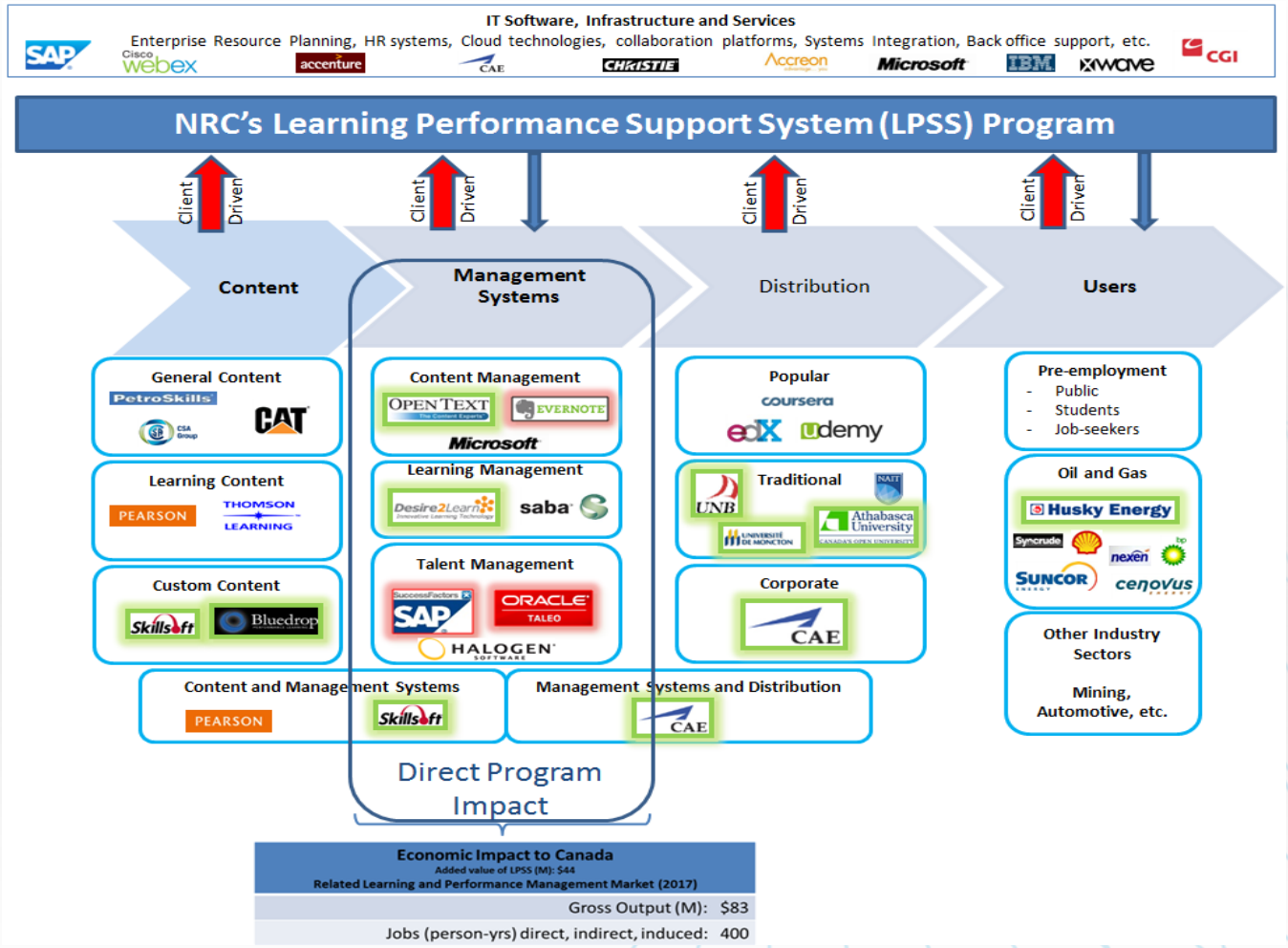
- NRC is a globally recognized leader in emerging learning technologies
  - Not core competencies for target clients
  - LPSS benefits from NRC's research in other fields
- NRC is deeply connected to the e-learning industry
  - University researchers not driven to spend the time with industry
  - NRC by contrast has collaboration and commercialization experience
  - Neutral broker reduces risk to technology development partners

NRC – Previous Work in eLearning

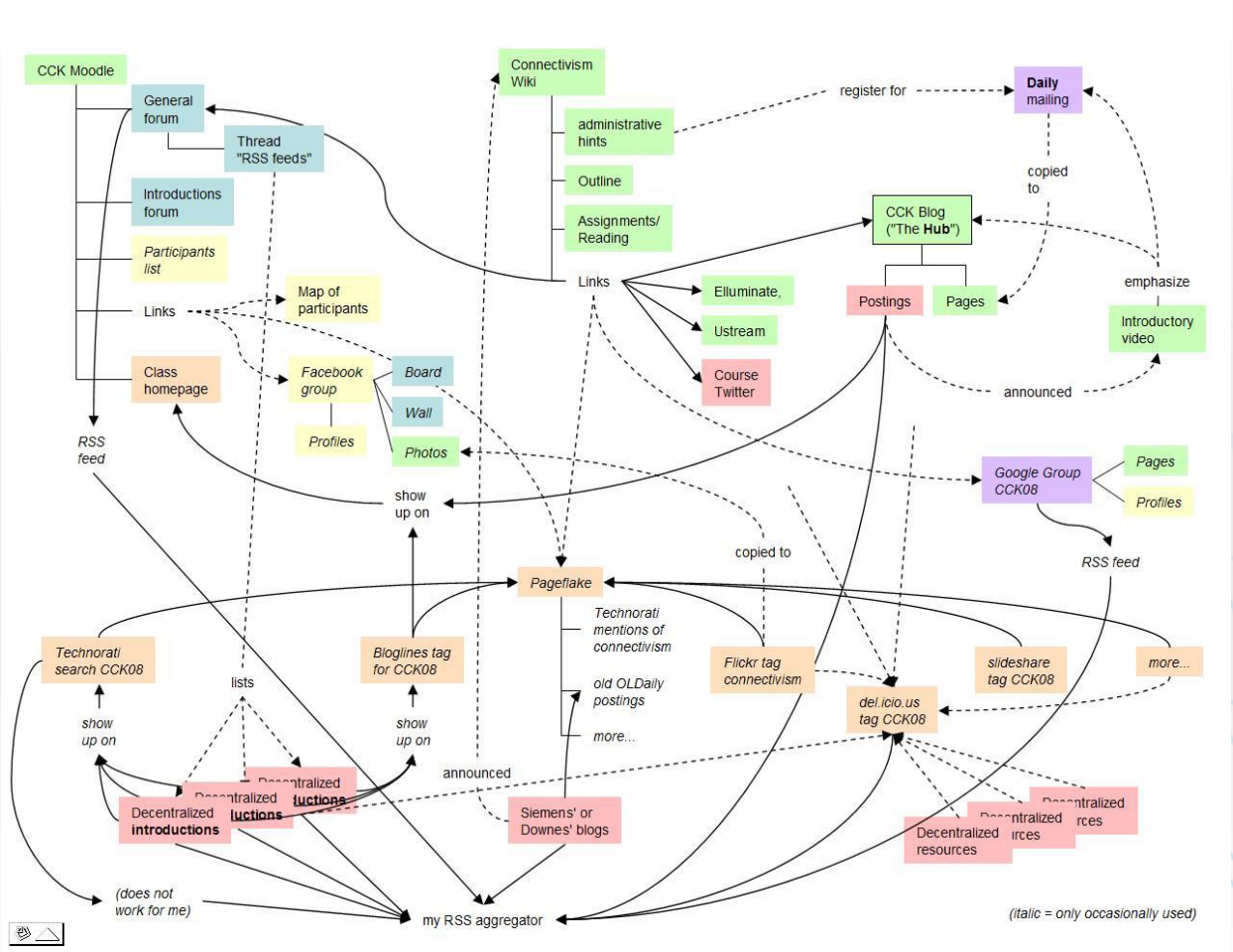


- eduSource Resource Repository Network (Canadian CANARIE Network)
- Sifter/Filter Content Recommender (connercialized as RACOFI)
- SHARE Sentiment Analysis
- Synergic3 Collaborative Workflow (commecialized with Desire2Learn)
- gRSShopper / MOOC / Connectivism
- 2Sim Haptic Simulations

LPSS in Canada's Learning Technology Marketplace



The Connected Application



http://x28newblog.blog.uni-heidelberg.de/2008/09/06/cck08-first-impressions/

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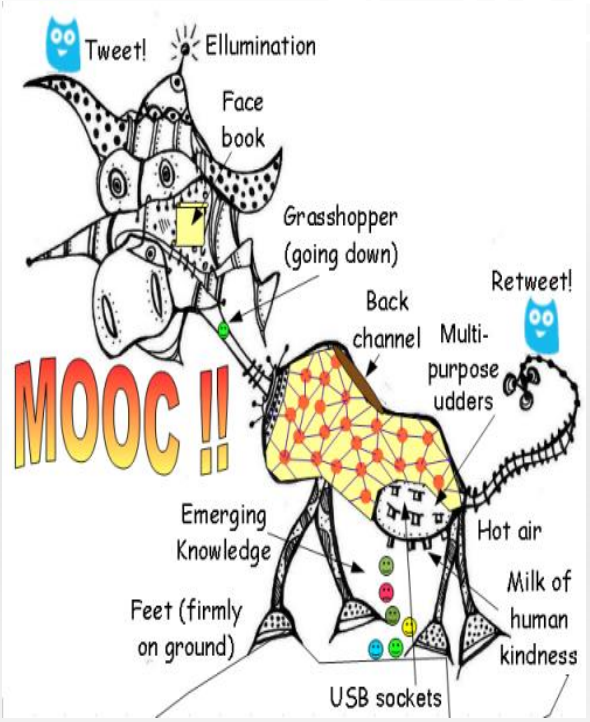


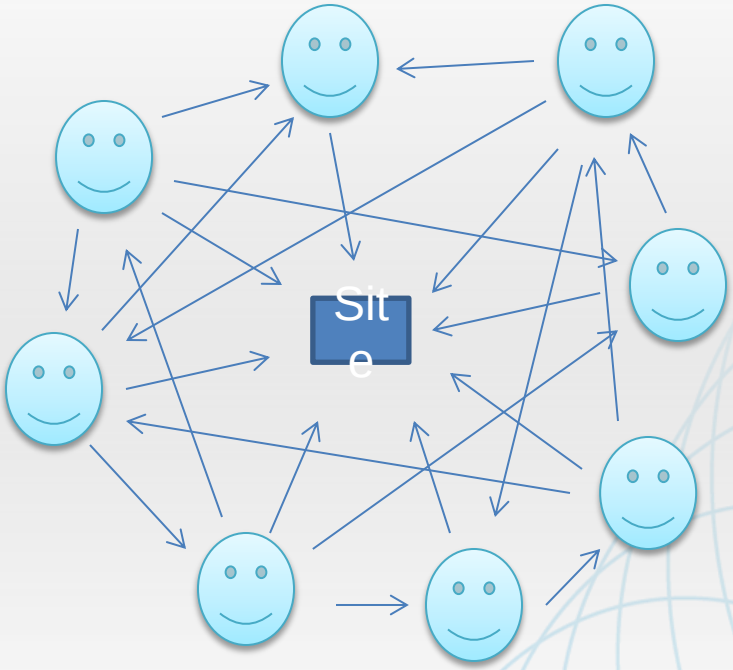
Massive – by design

Open – gratis and libre

Online – not blended, not wrapped

Courses – not communities, websites, video collections, etc

Massive Open Online Course

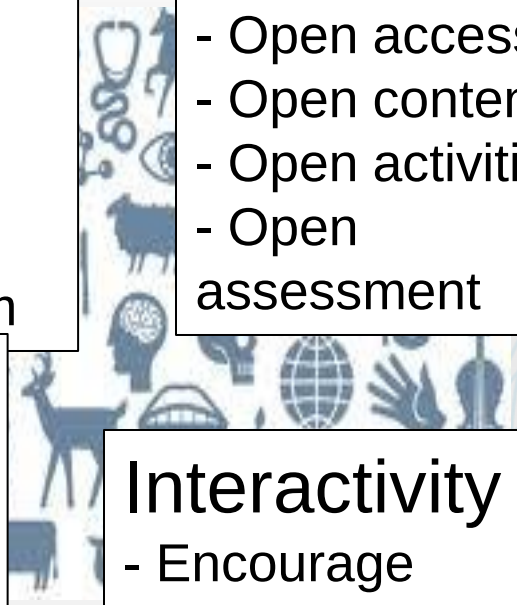


A MOOC is a Web, not a Website

Design Principles

Autonomy
- Choice of contents
- Personal learning
- No curriculum

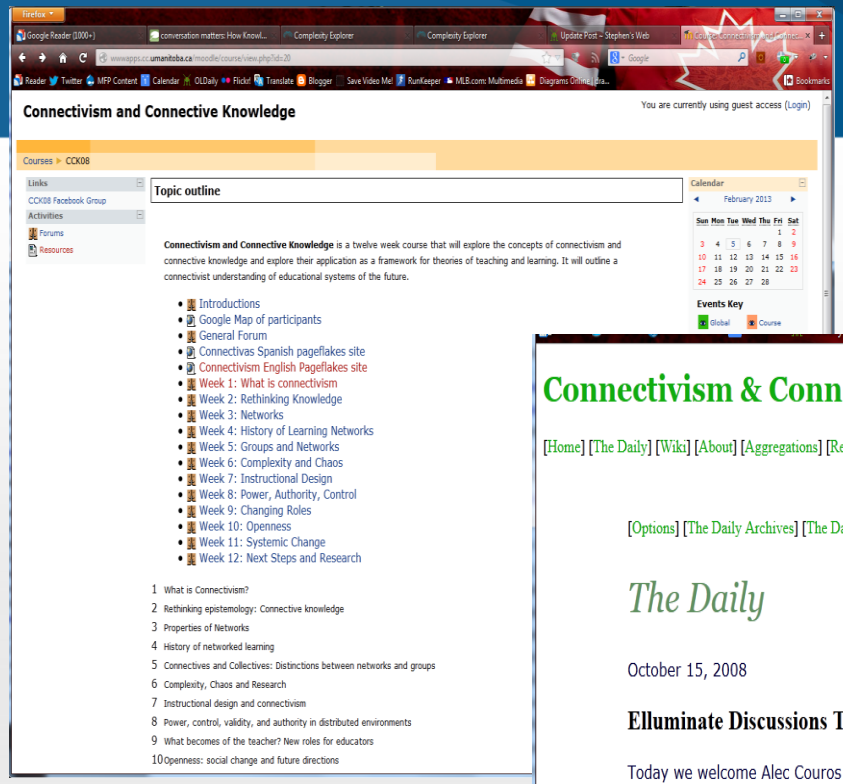
Openness
- Open access
- Open content
- Open activities
- Open assessment

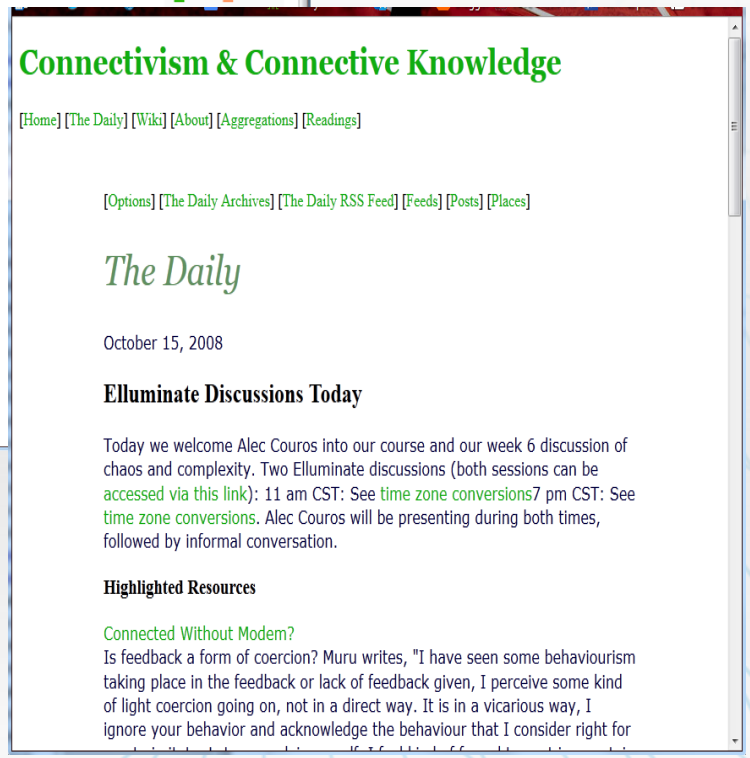


Diversity
- Multiple tools
- Individual perspective
- Varied content

Interactivity
- Encourage communication
- Cooperative learning
- Emergent knowledge

CCK08





http://wwwapps.cc.umanitoba.ca/moodle/course/view.php?id=20

2300 students

http://connect.downes.ca/cgi-bin/archive.cgi?page=thedaily.htm

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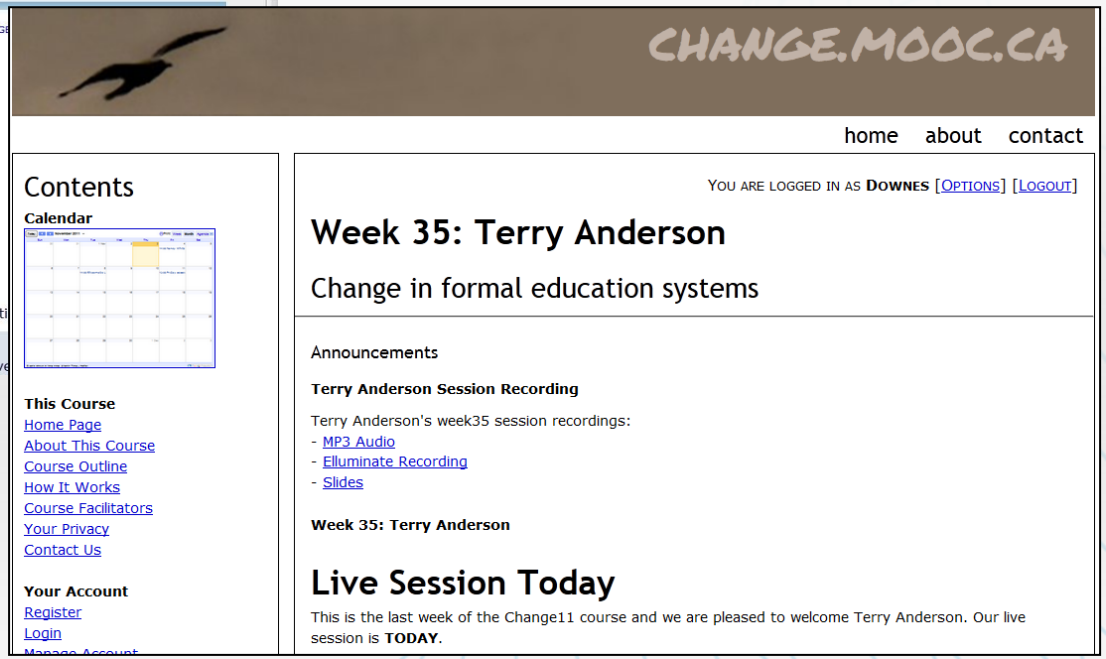
Other Courses

1800 students

http://connect.downes.ca/

3000 students

http://edfuture.net/



2800 students

http://change.mooc.ca/

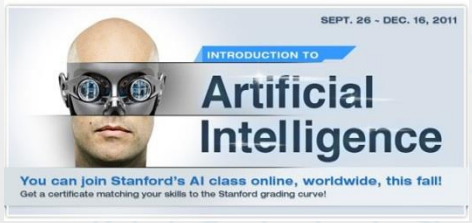
cMOOC vs xMOOC

networks

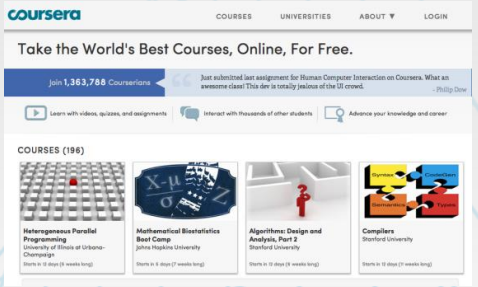
tasks

content
s

http://ds106.us/history/



https://www.ai-class.com/

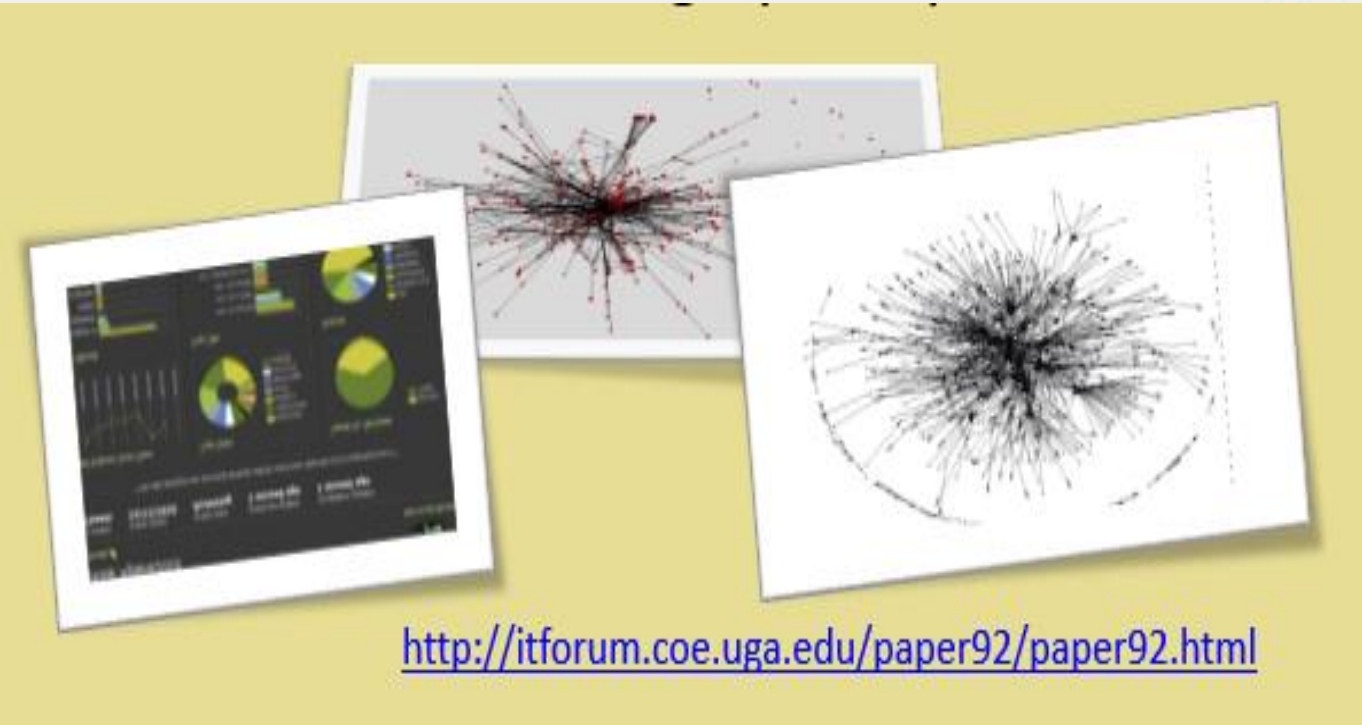


https://www.coursera.org/

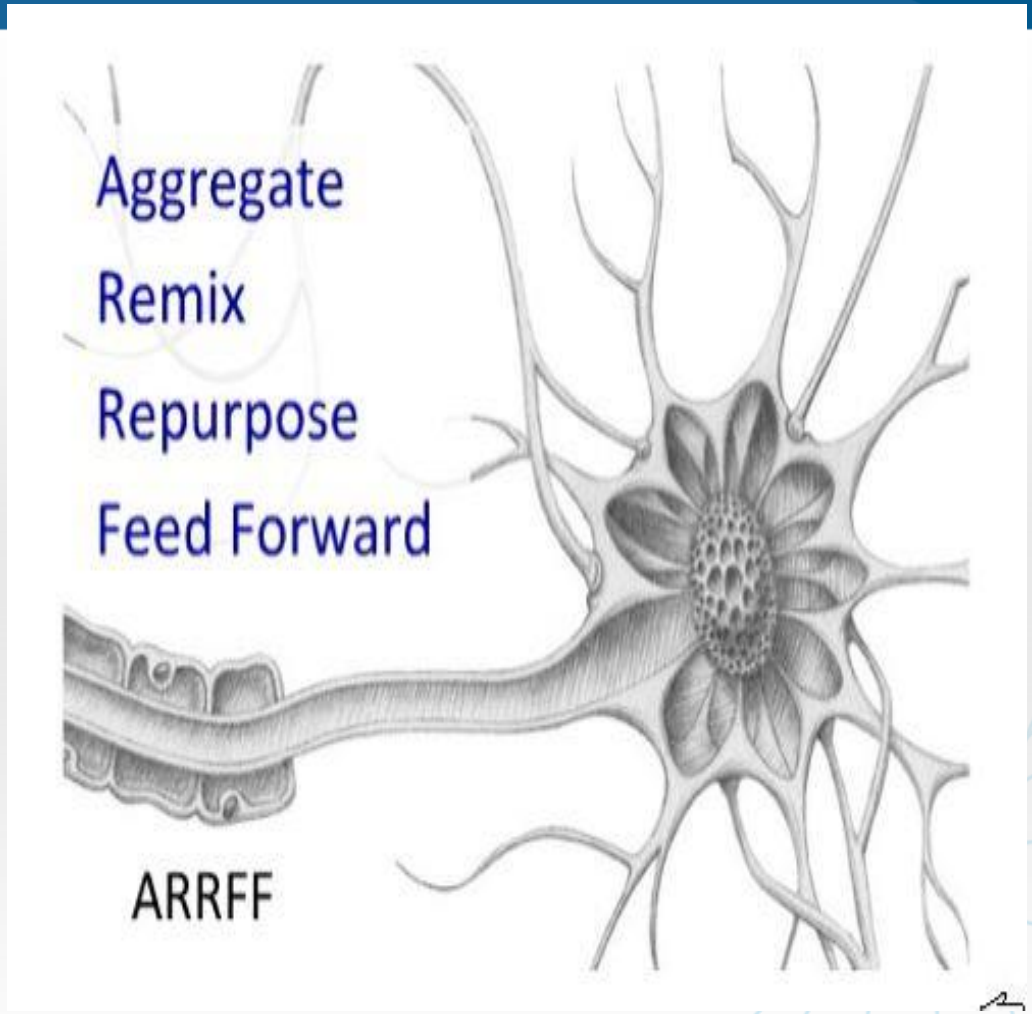
http://lisahistory.net/wordpress/2012/08/three-kinds-of-moocs/

Design principles of the cMOOC

Autonomy, diversity, openness, interactivity

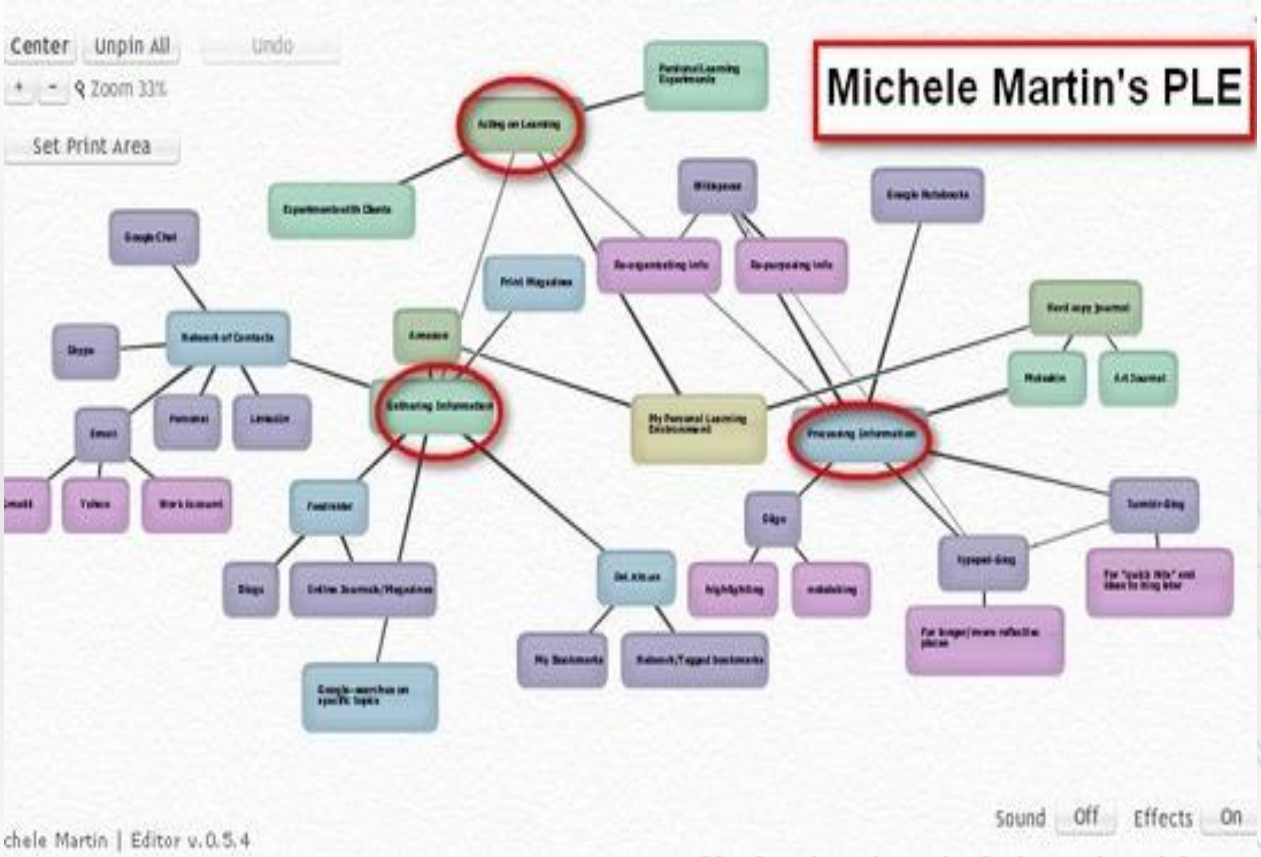


Pedagogy of the cMOOC



http://cogdogblog.com/2009/06/29/arrff/

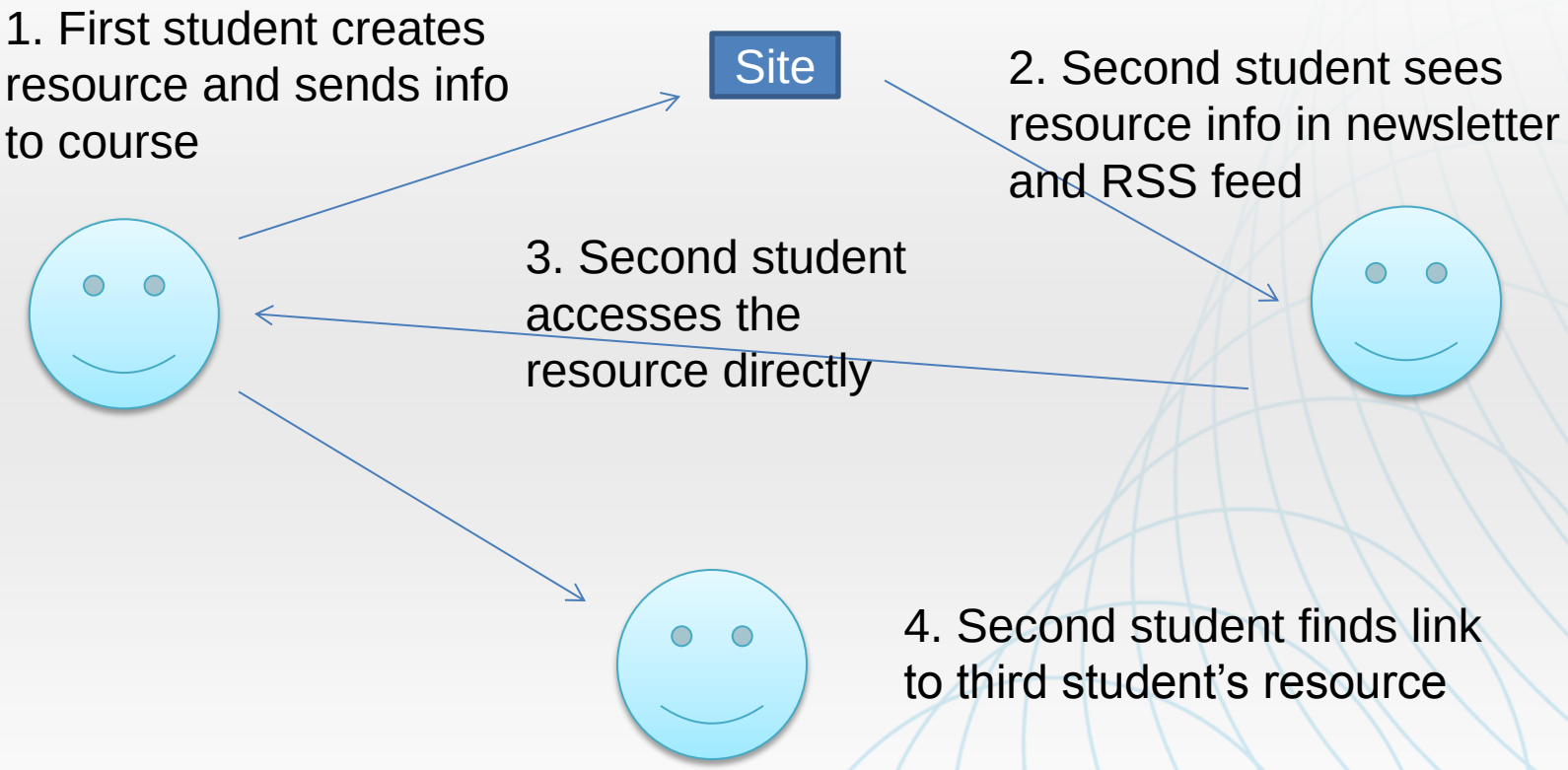
Personal Learning



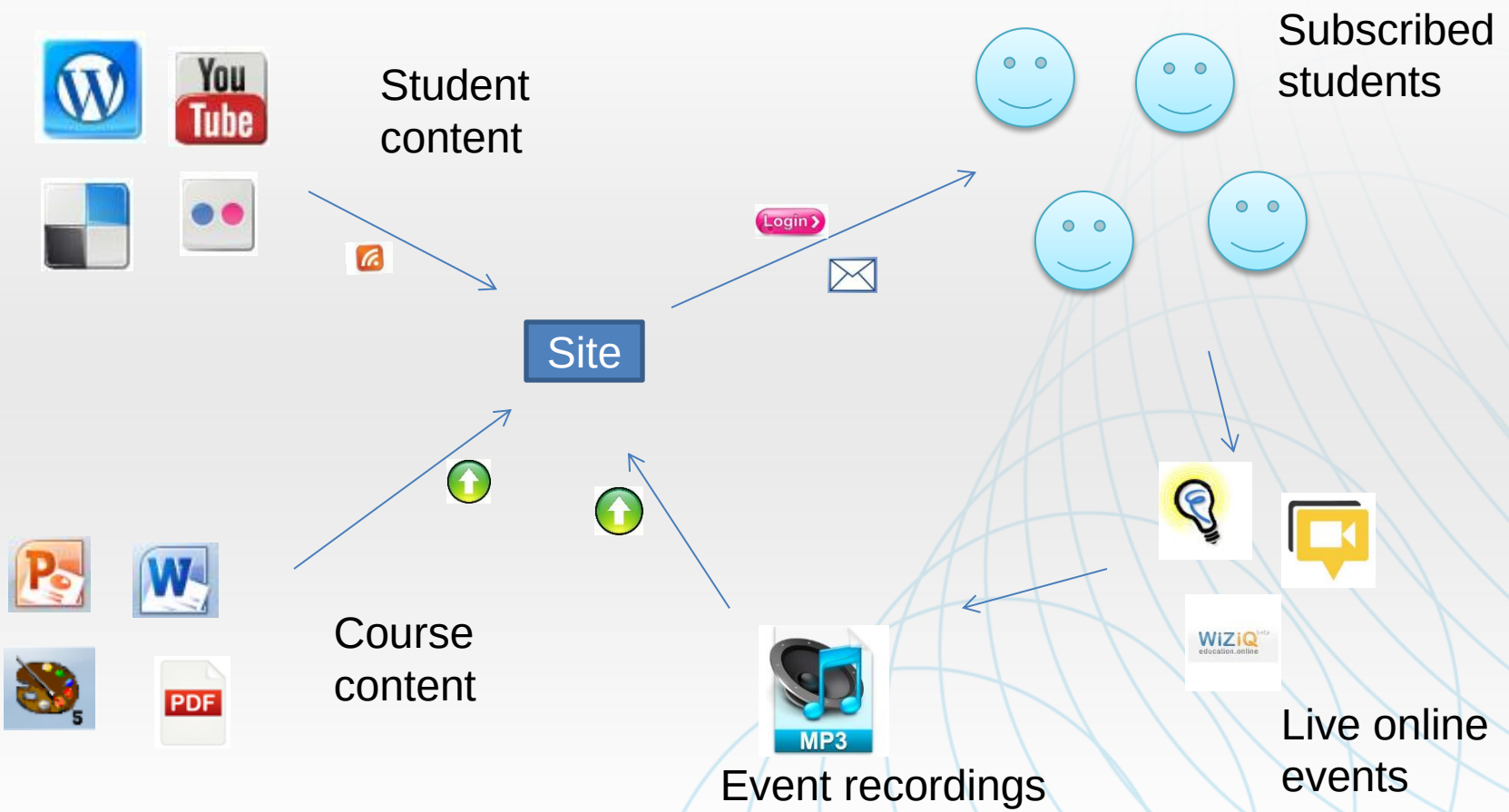
http://dmlcentral.net/blog/howard-rheingold/diy-u-interview-anya-kamenetz

http://www.downes.ca/post/58150

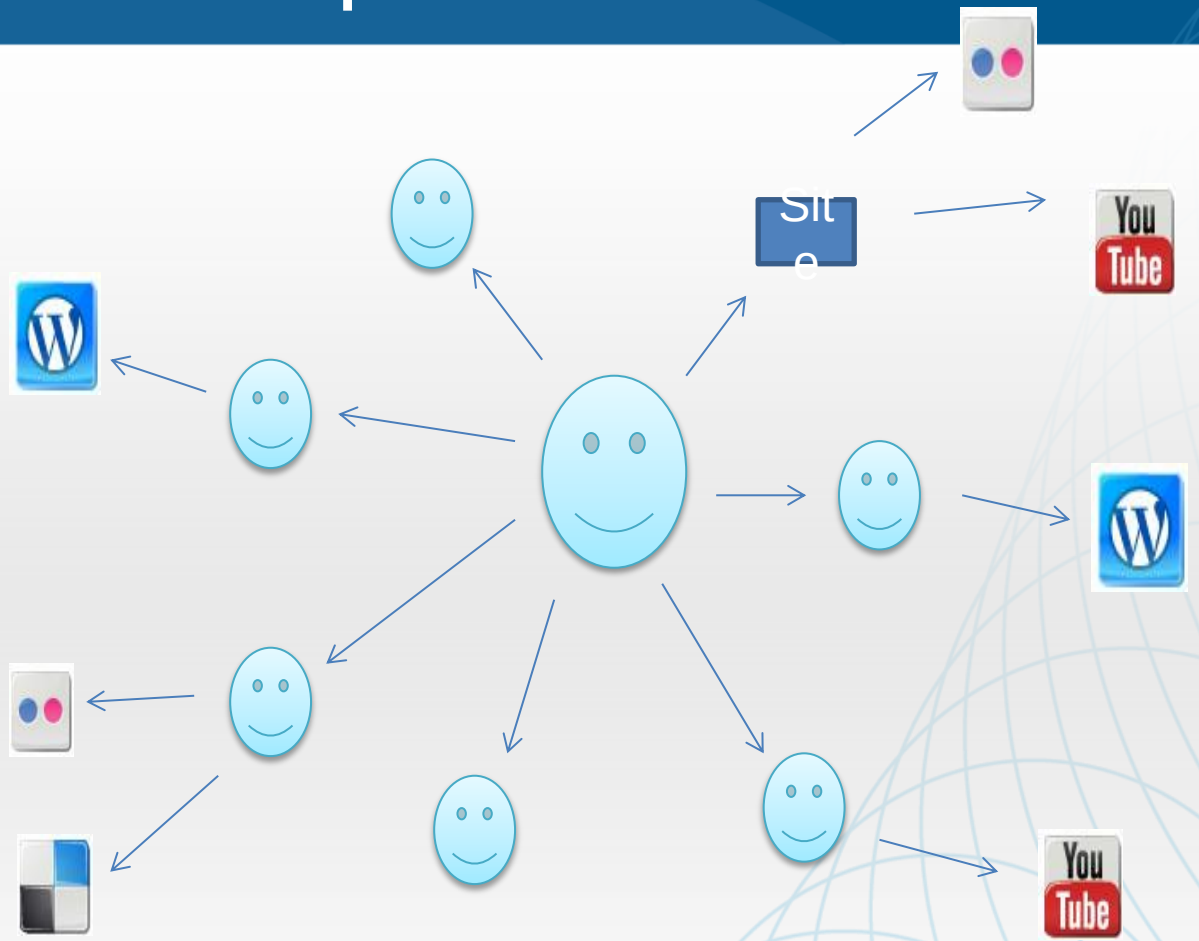
Underlying MOOC Support



Course Provider Perspective

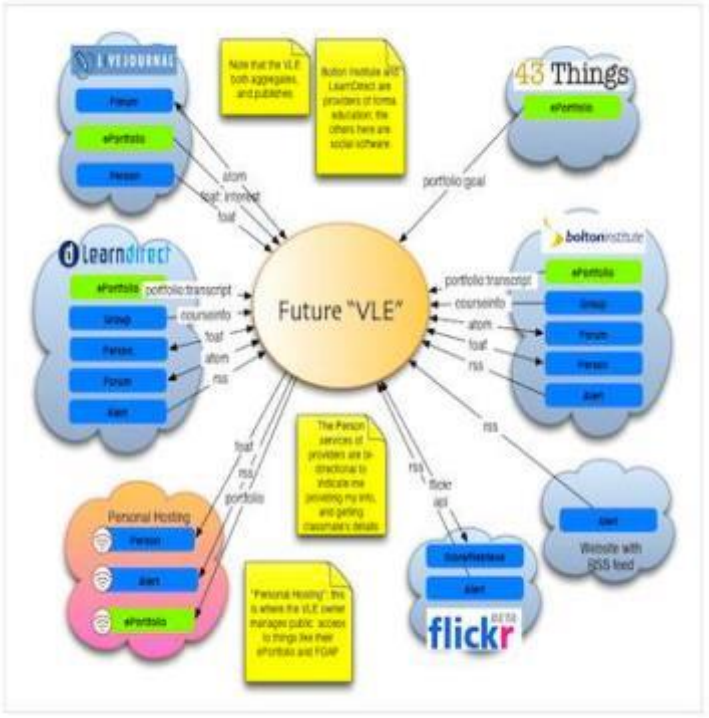


The Student's Perspective



A range of different resources and services

The design is based on putting the learner at the centre

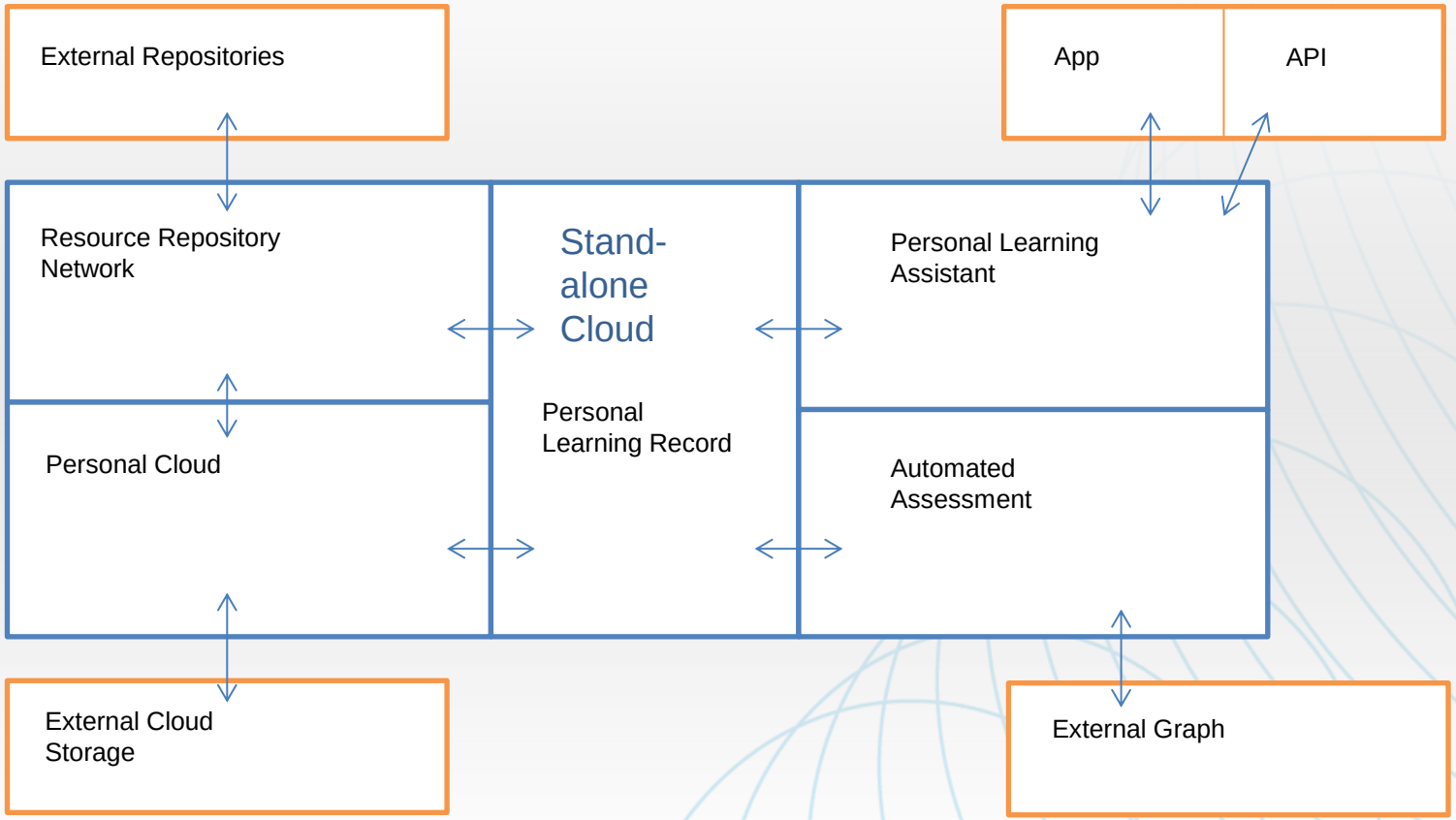


Scott Wilson (left), Tim Hand (right)

https://www.google.com/search?q=ple+diagrams

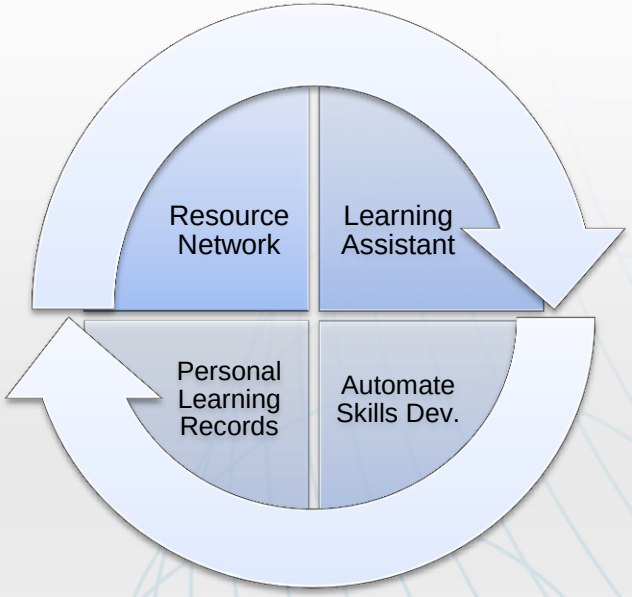
http://www.edtechpost.ca/ple_diagrams/index.php/mind-map-3

Simplified Design



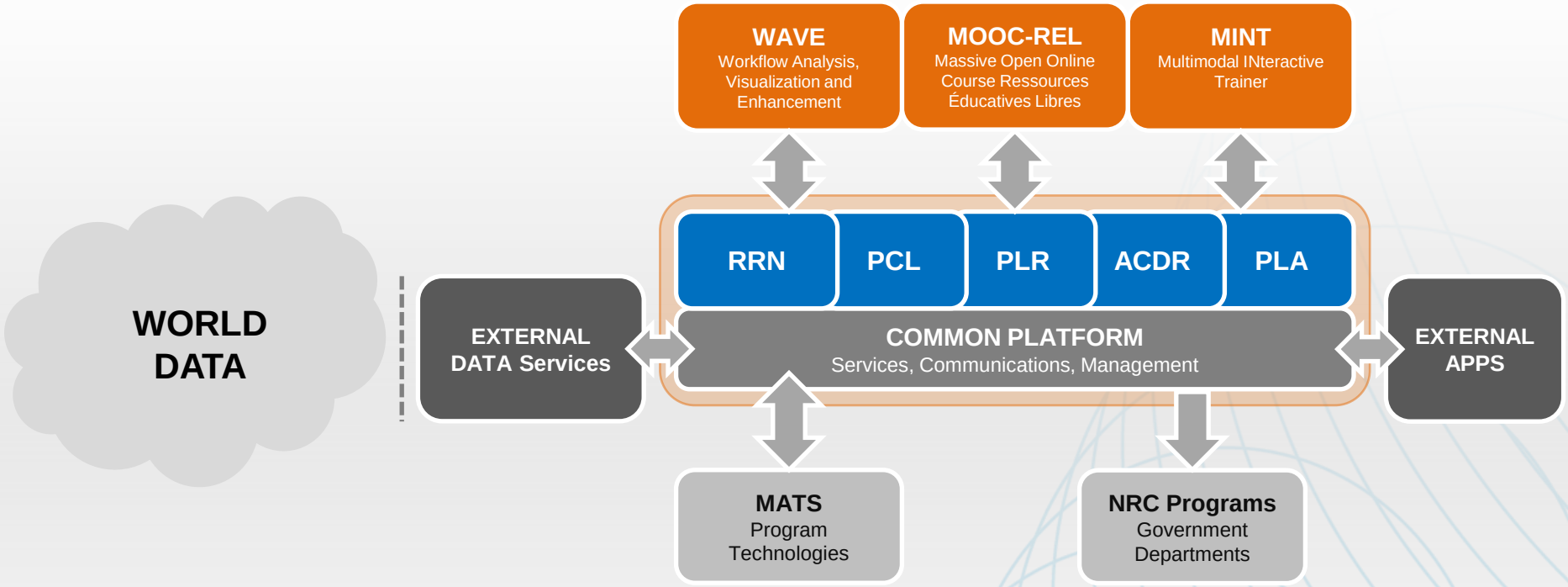
Learning and Performance Support System: Core Technology Development Projects

- Learning services network and marketplace
- Automated skills development and recognition
- Lifetime management of learning and training records and credentials
- Personal learning assistant to view, update and access training



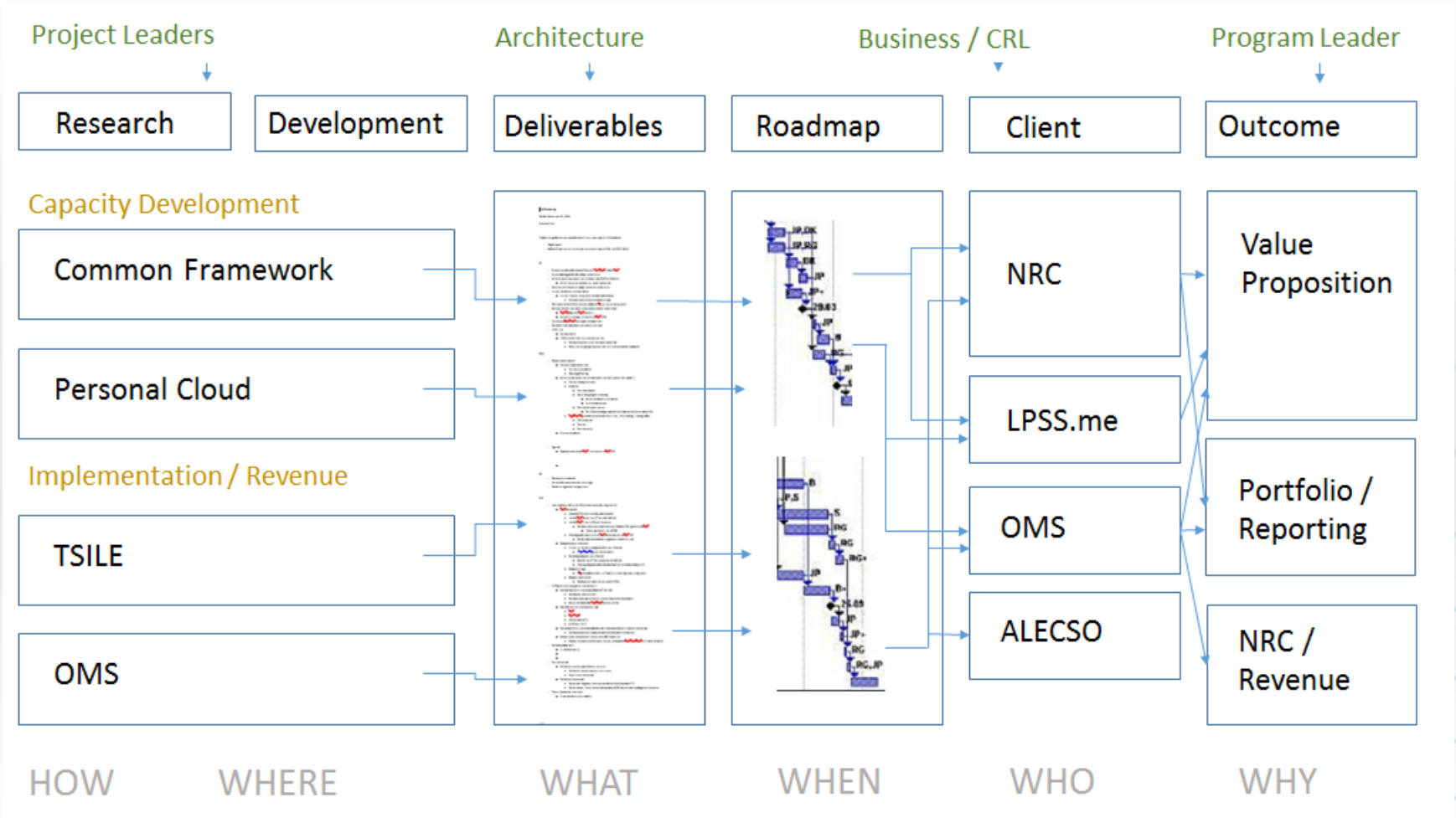
- Learning as a cloud service and deep integration with external systems

Program Design and Scope

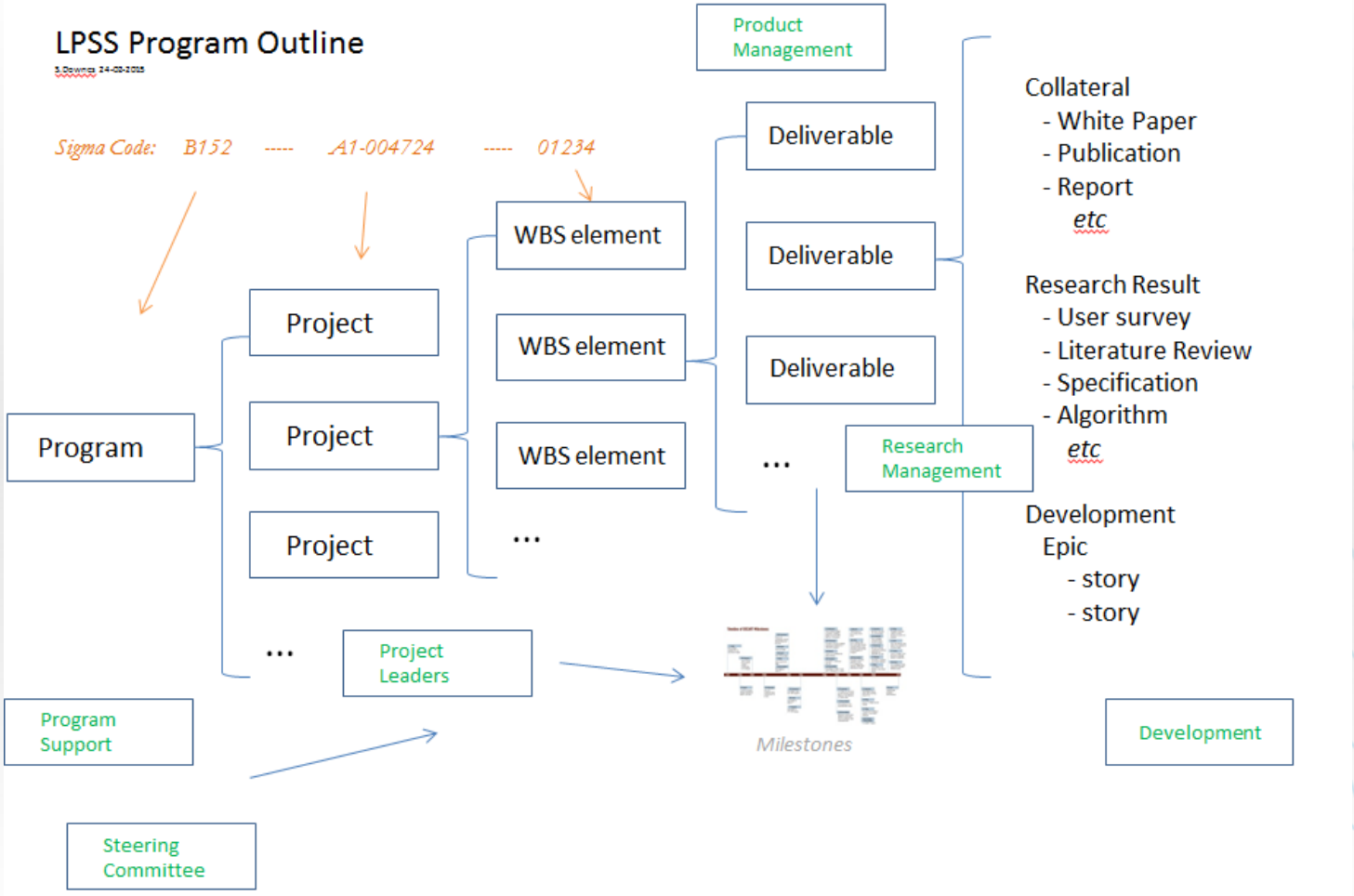


Blue: Core technology projects
Orange: Implementation projects with commercial clients
Grey: Infrastructure, other NRC programs, external services

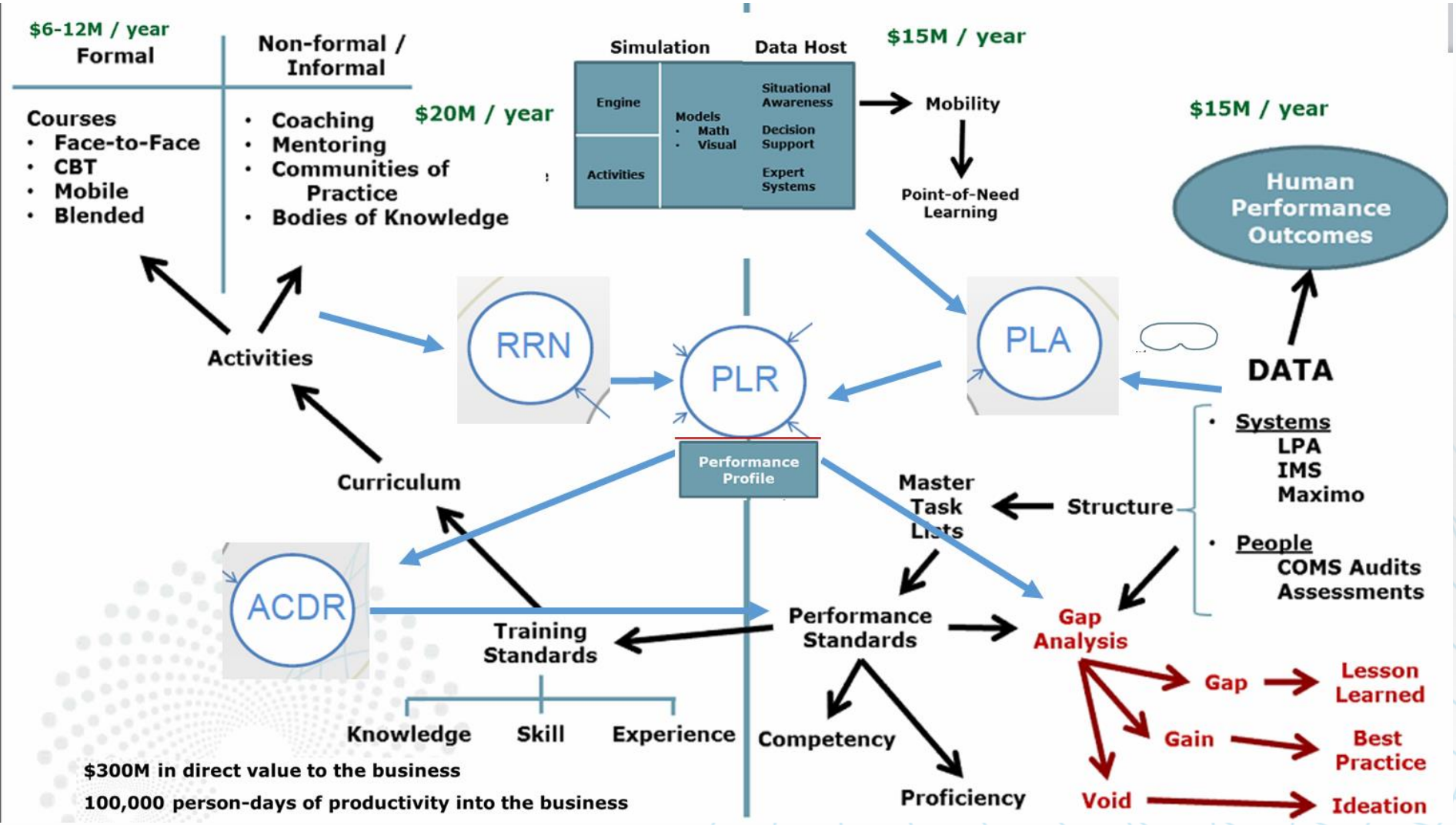
Program Organization



Program Outline

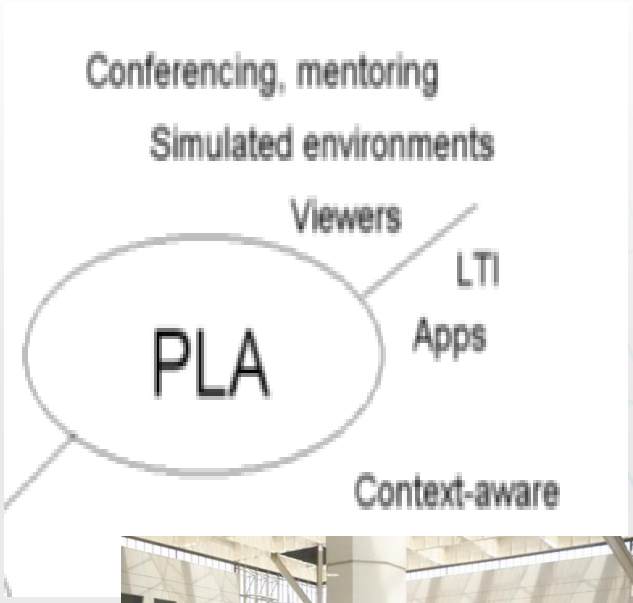


LPSS in Context

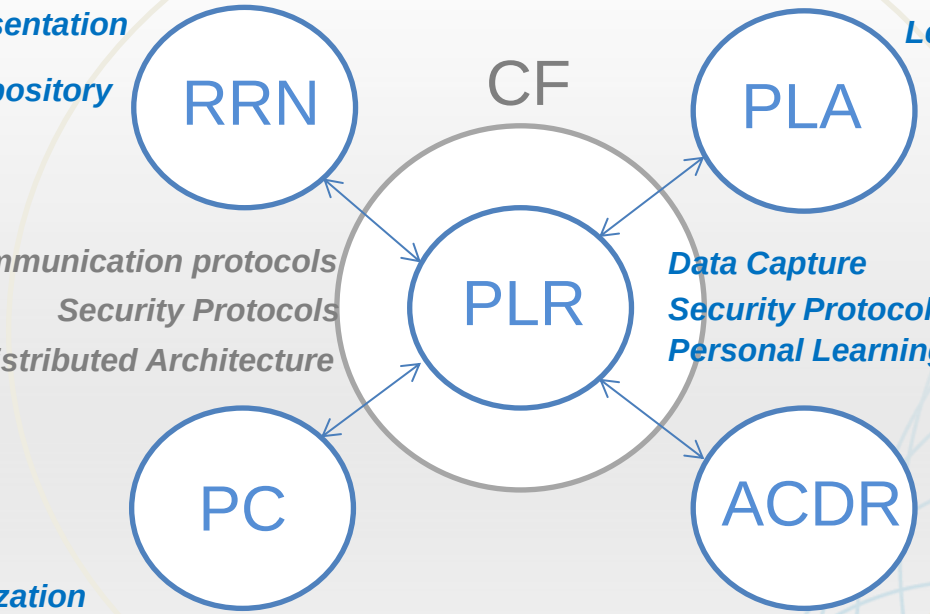


Personal Learning Assistant

- Collect contextual information for system
- Display resources of various formats, including SCORM, LTI, etc.
- Support (scaffolded) authoring environments
- Project LPSS capacity into external software and devices



Project Details



Data, Information Retrieval

Cleansing/Filtering/Profiling/Processing

Data Representation

Prototype Repository

Management Layer

Search/Recommendation Layer

Learning activity sequencing/modeling

Standards/Communication protocols

Security Protocols

Distributed Architecture

Data Capture

Security Protocols

Personal Learning Record

Data synchronization

Personal Access to Network Storage

Cloud Storage and Management

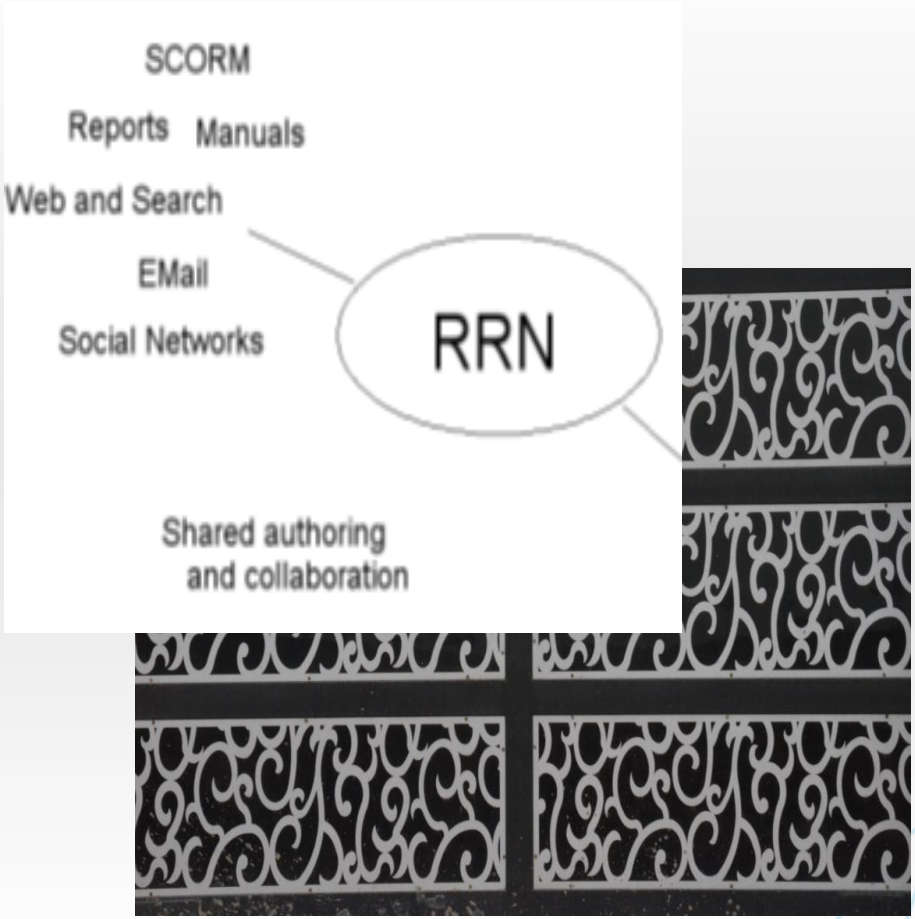
TROI (Training Return on Investment) analytics

Performance Trends Algorithm

Competence Development

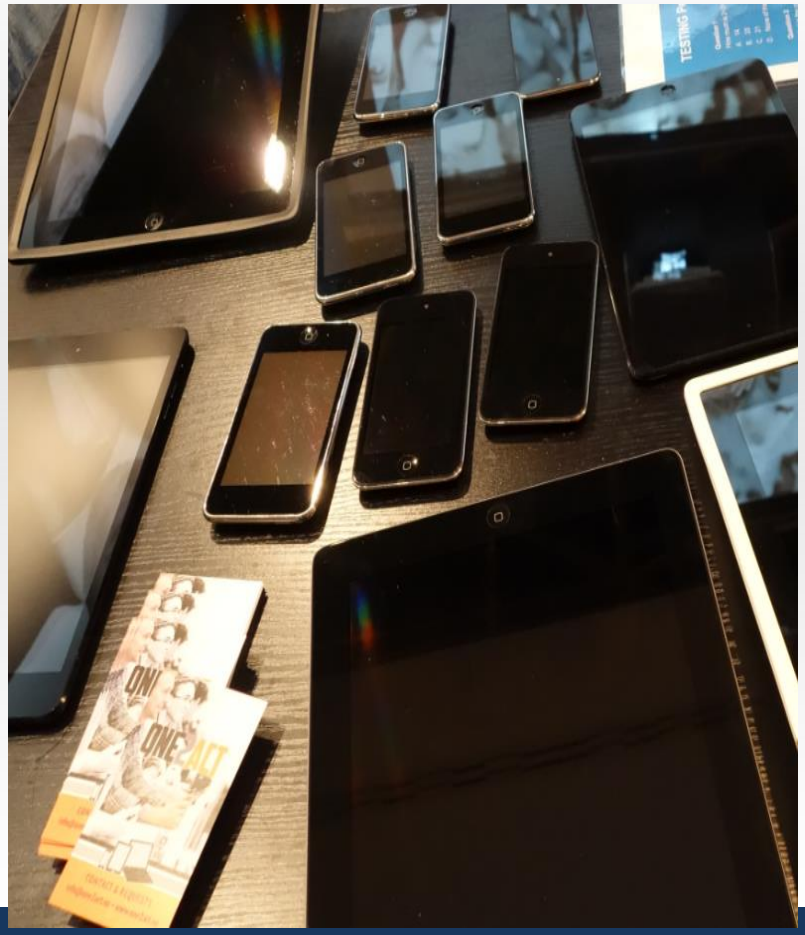
Automated Assessment

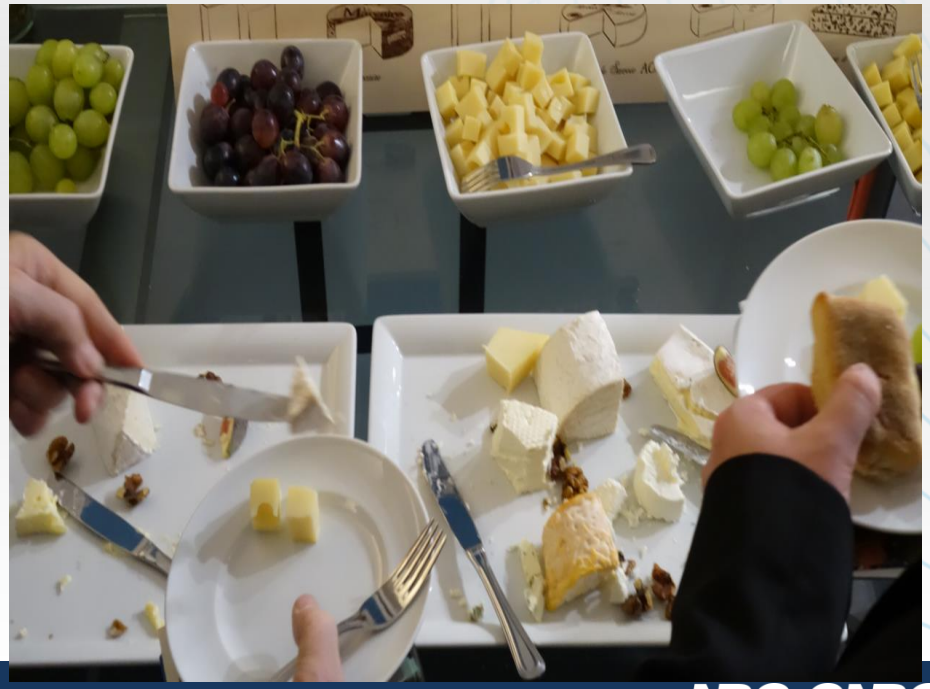
Resource Repository Network



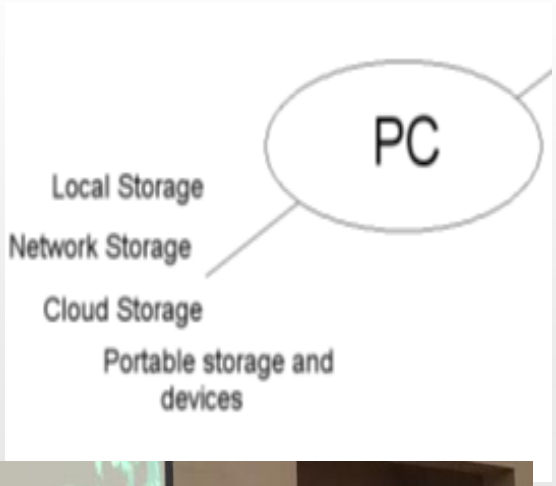
- Manage and discover list of sources and resources
- Maintain authentication and credentials
- Support APIs and metadata standards
- Gather, analyze and sort resources and/or metadata

Synchronized cloud data services (including Owncloud) to support data portability



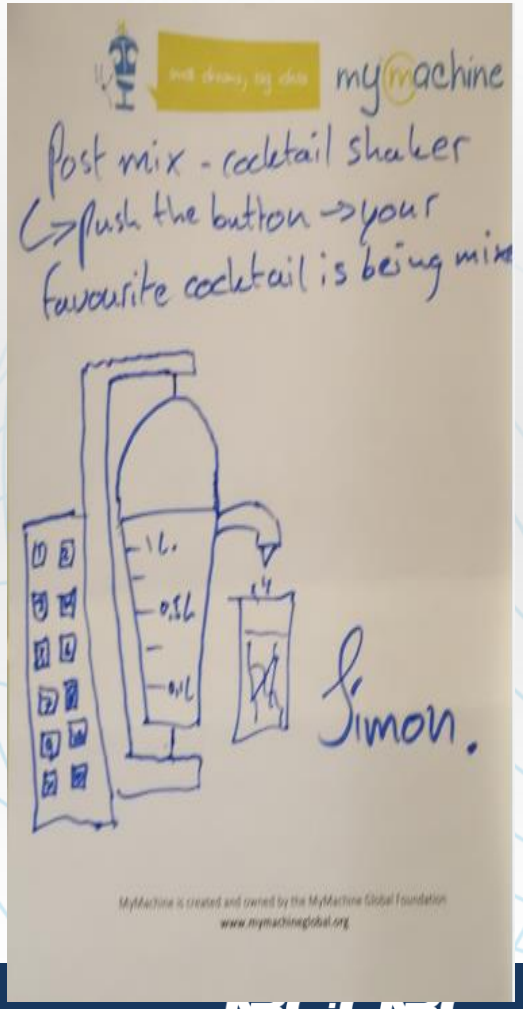


Personal Cloud



- Manage list of local and remote storage systems
- Maintain security, encryption, authentication and credentials
- Include local or personal device storage
- Manage and synchronize resource sets and data

Projection of learning services into multiple platforms



Personal Learning Assistant

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- Display resources of various formats, including SCORM, LTI, etc.
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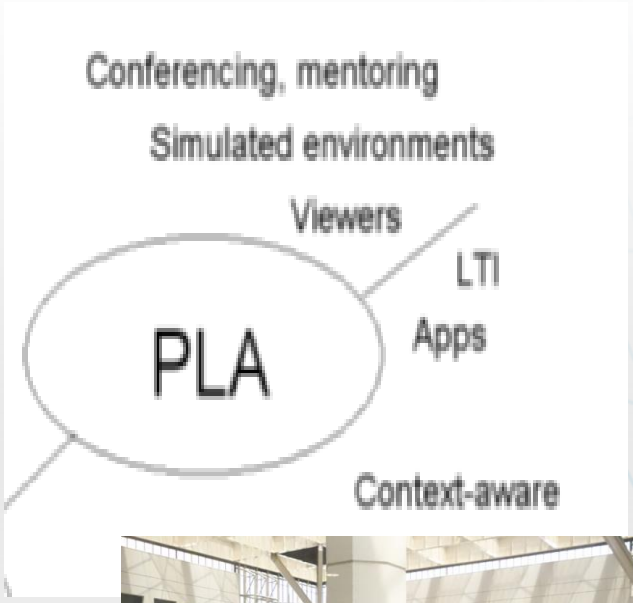
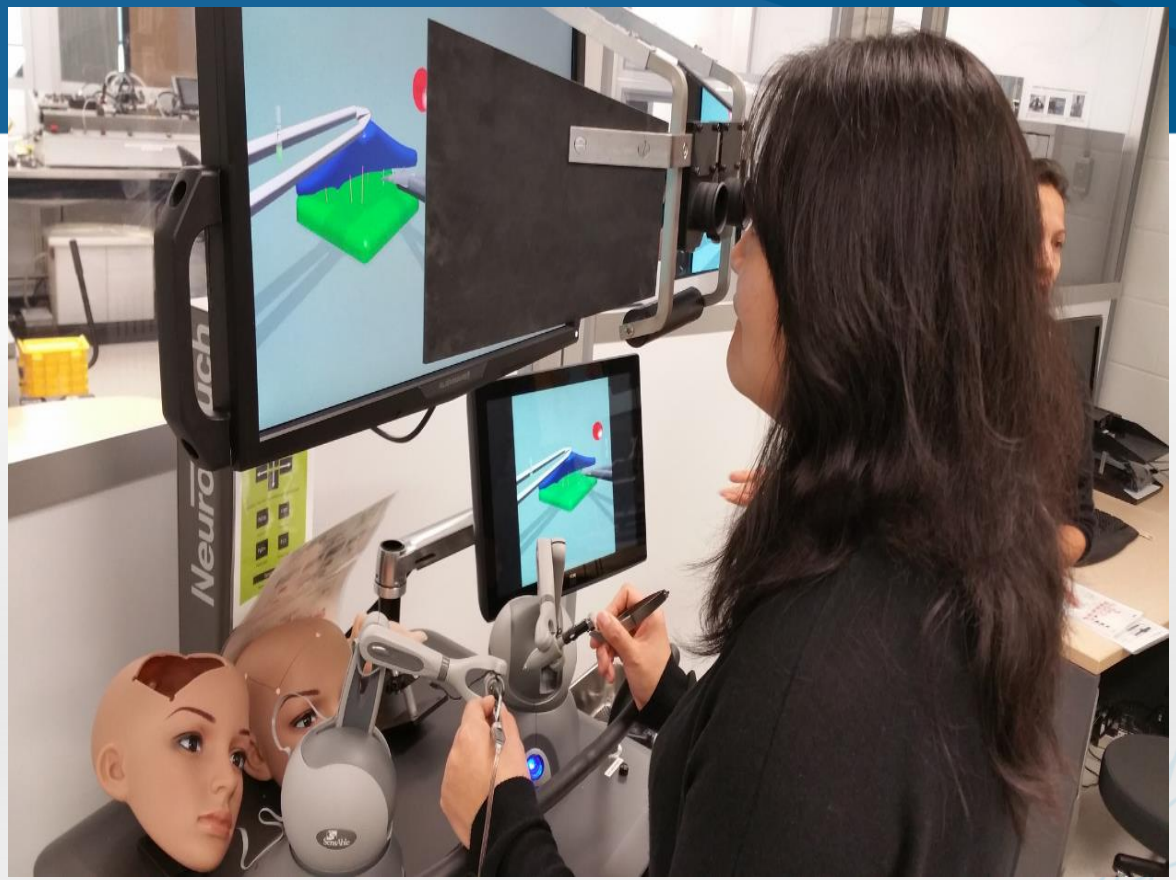


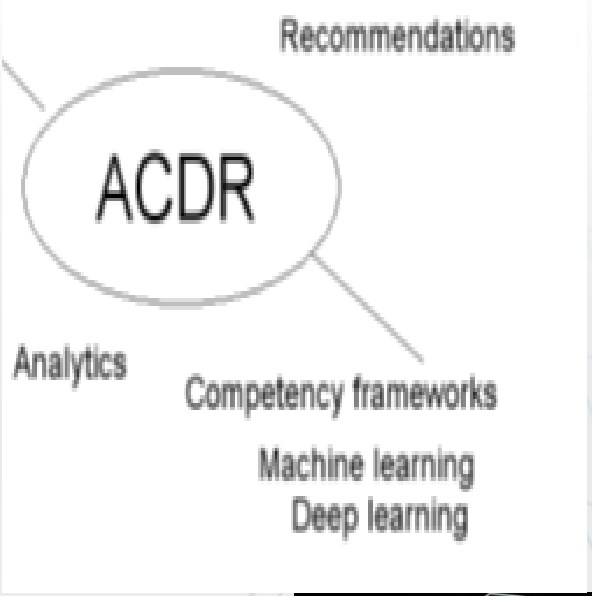


Connecting to real learning and workplace environments

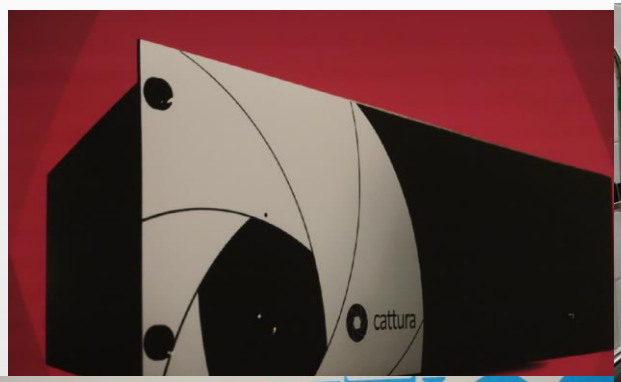
http://www.nrc-cnrc.gc.ca/eng/rd/medical/

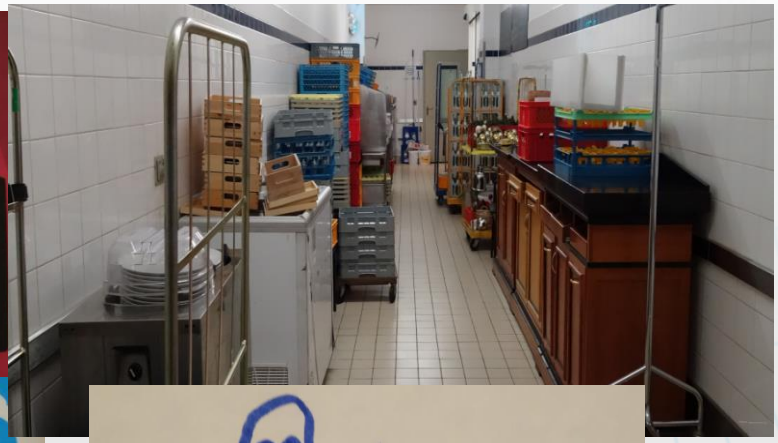
Competency Recognition and Development

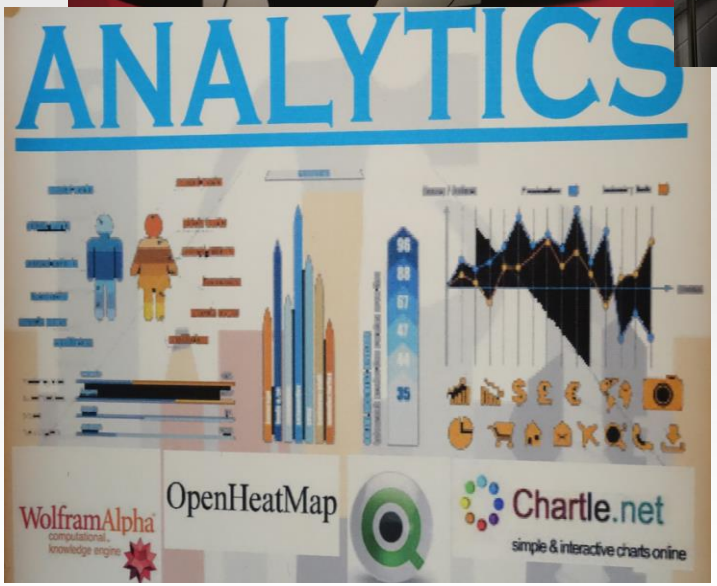
- Import or create competency definitions
- Analyze interactions for skills and learning gaps
- Support development of learning plans
- Provide resource and service recommendations

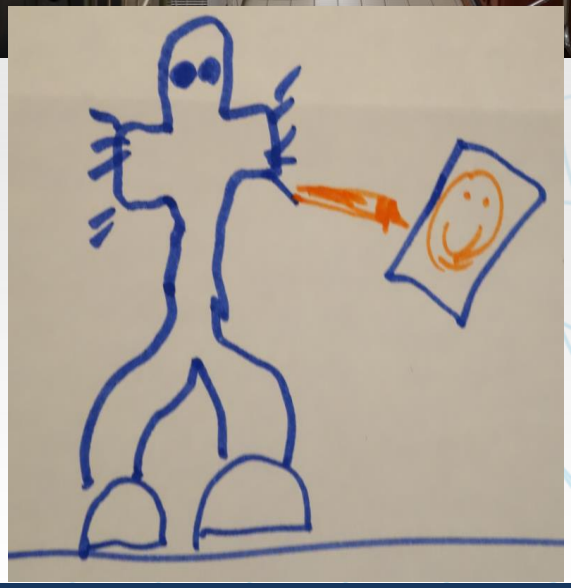


Analytics as a service – analogy with web translation









The Personal Learning Record – data owned by the individual, shared only with permissions

http://halfanhour.blogspot.de/2014/12/eportfolios-and-badges-workshop-oeb14.html

Personal Learning Record

- Collect full record of interactions with all resources, external systems
- Support learning activity data exchange formats (eg. xAPI)
- Collect and present a person's personal portfolio
- Display certifications and credentials (eg. badges)
- Maintain 3rd party certification

Relevant PLR Projects

Manchester PLE Project

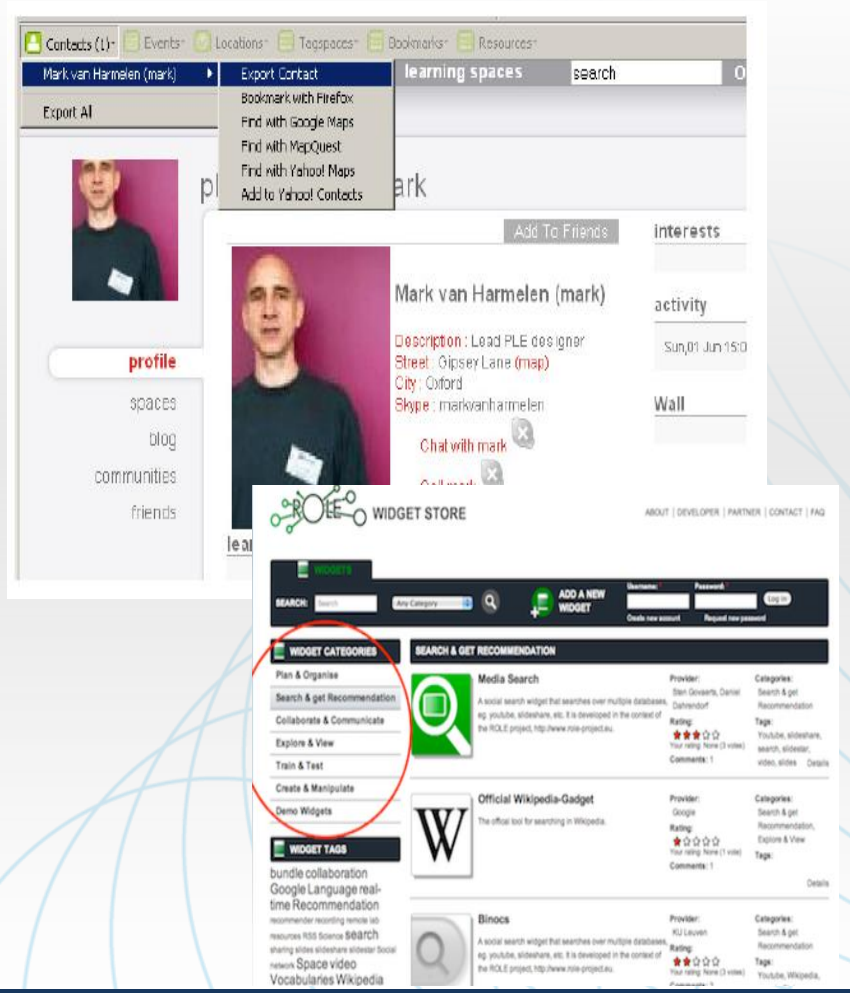
Responsive Open Learning Environments (ROLE)
http://www.role-project.eu/

Known http://withknown.com/

Learning Locker
http://learninglocker.net/

Mahara https://mahara.org/

http://personalis.wikispaces.com/PLE+Projects



Implementation – from MOOC to Personal Learning

MOOC-REL (OIF)

ALECSO

MINT

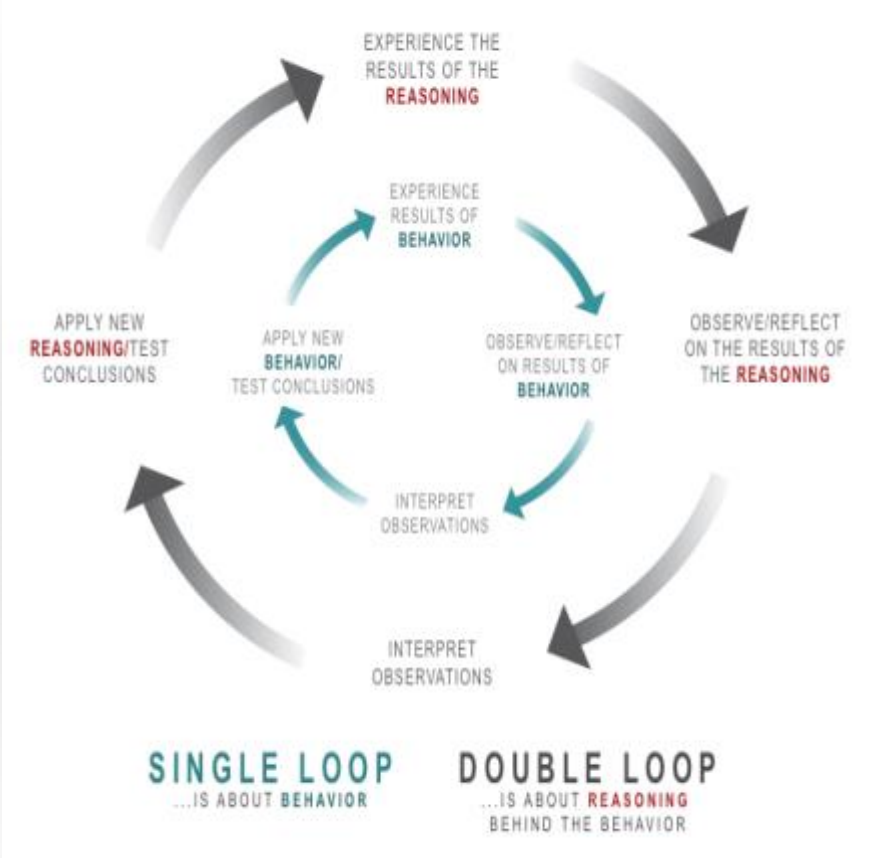
PCO Badges

TSILE xAPI

2Sim Simulator xAPI

Workplace T&D

Implementation Projects



Ultimately, the objective is to support individual learning in a network

http://integralleadershipmanifesto.com/manifesto/making-subject-object/

Why is this Difficult?

It’s not one big thing…

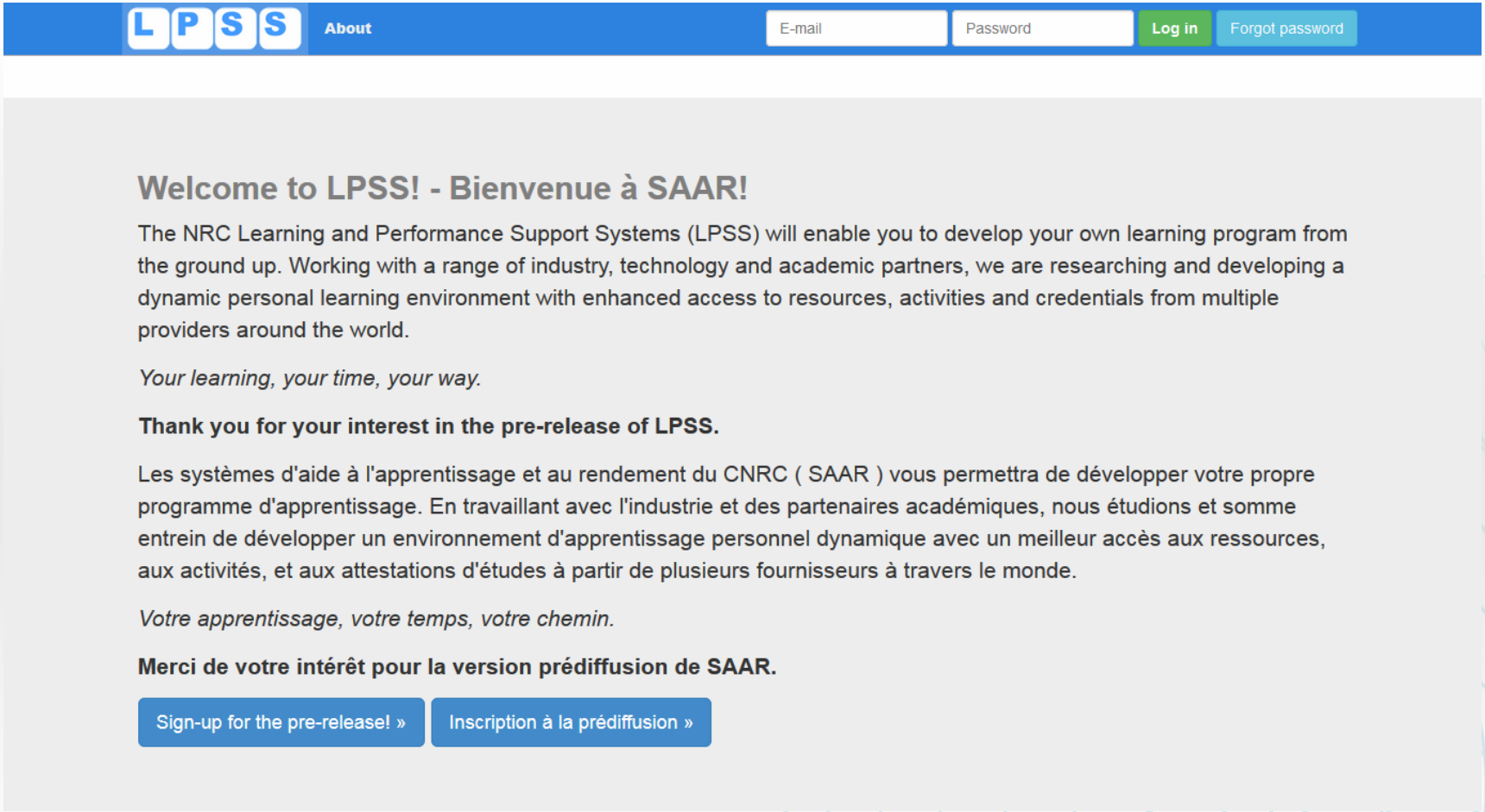
… but a set of many small things

Tasks that are simple in an enterprise system…

- Like data storage
- Like content distribution
- Like authentication
- Like analytics

… become that much more difficult

Launch Day


LPSS
About
E-mail
Password
Log in
Forgot password
Welcome to LPSS! - Bienvenue à SAAR!
The NRC Learning and Performance Support Systems (LPSS) will enable you to develop your own learning program from the ground up. Working with a range of industry, technology and academic partners, we are researching and developing a dynamic personal learning environment with enhanced access to resources, activities and credentials from multiple providers around the world.
Your learning, your time, your way.
Thank you for your interest in the pre-release of LPSS.
Les systèmes d'aide à l'apprentissage et au rendement du CNRC (SAAR) vous permettra de développer votre propre programme d'apprentissage. En travaillant avec l'industrie et des partenaires académiques, nous étudions et somme entrein de développer un environnement d'apprentissage personnel dynamique avec un meilleur accès aux ressources, aux activités, et aux attestations d'études à partir de plusieurs fournisseurs à travers le monde.
Votre apprentissage, votre temps, votre chemin.
Merci de votre intérêt pour la version prédiffusion de SAAR.
Sign-up for the pre-release! »
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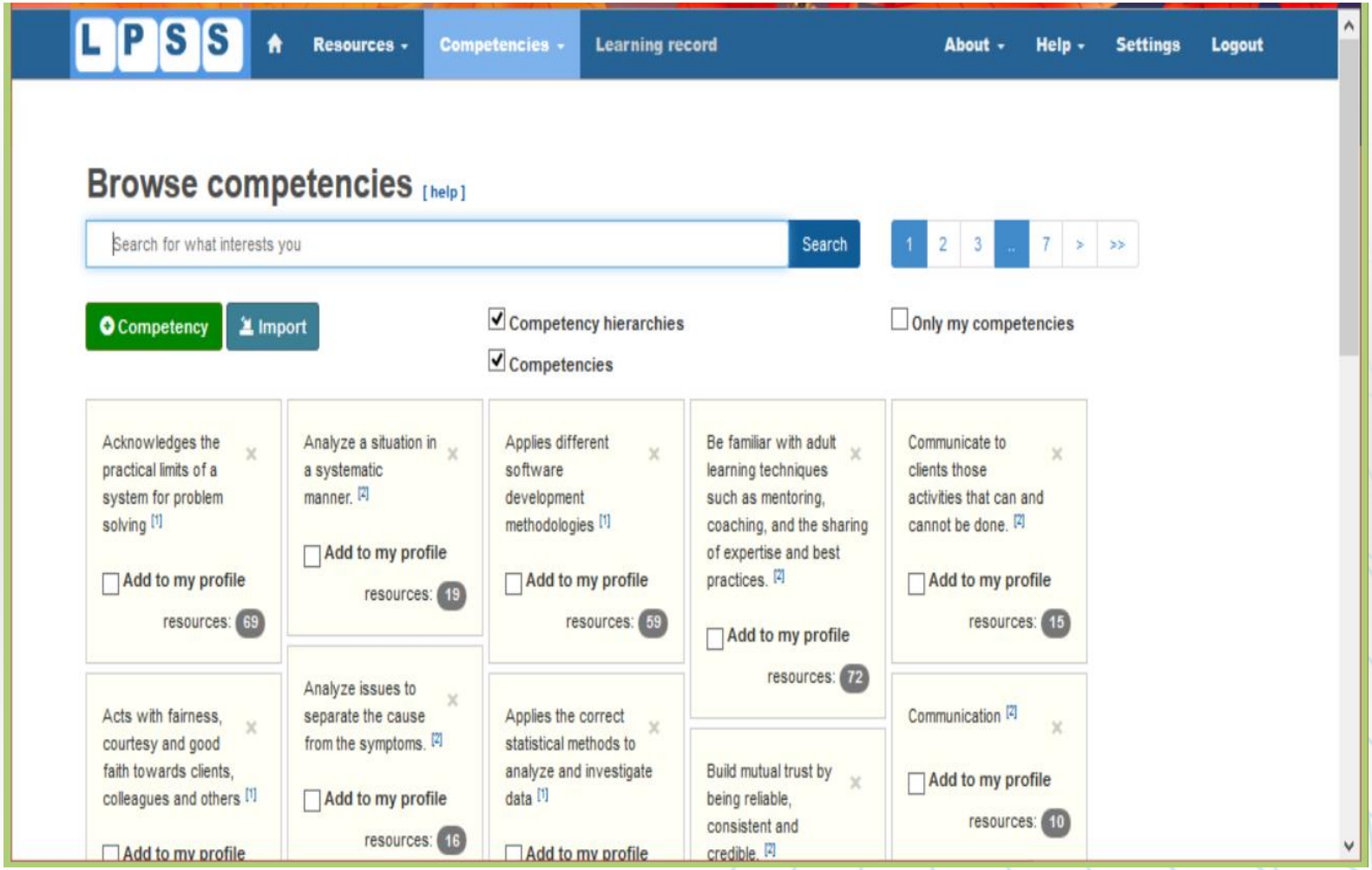
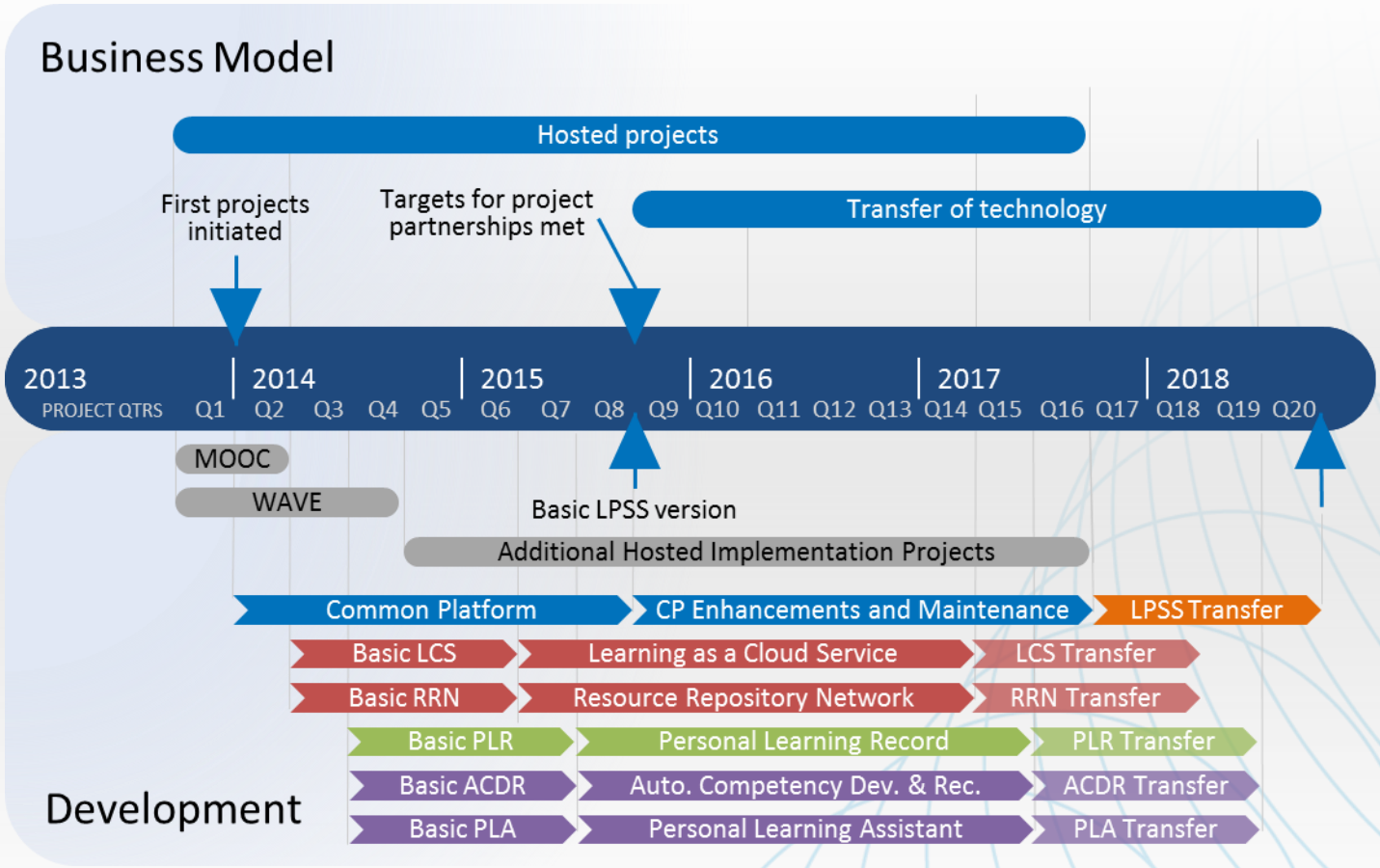
http://lpss.me – prototype PLE



Program Implementation Timeline



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