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Design elements in a personal learning environment
Downes, Stephen

National Research Council Canada   Conseil national de recherches Canada

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

National Research Council Canada

Conseil national de recherches Canada

Canada

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.

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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

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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
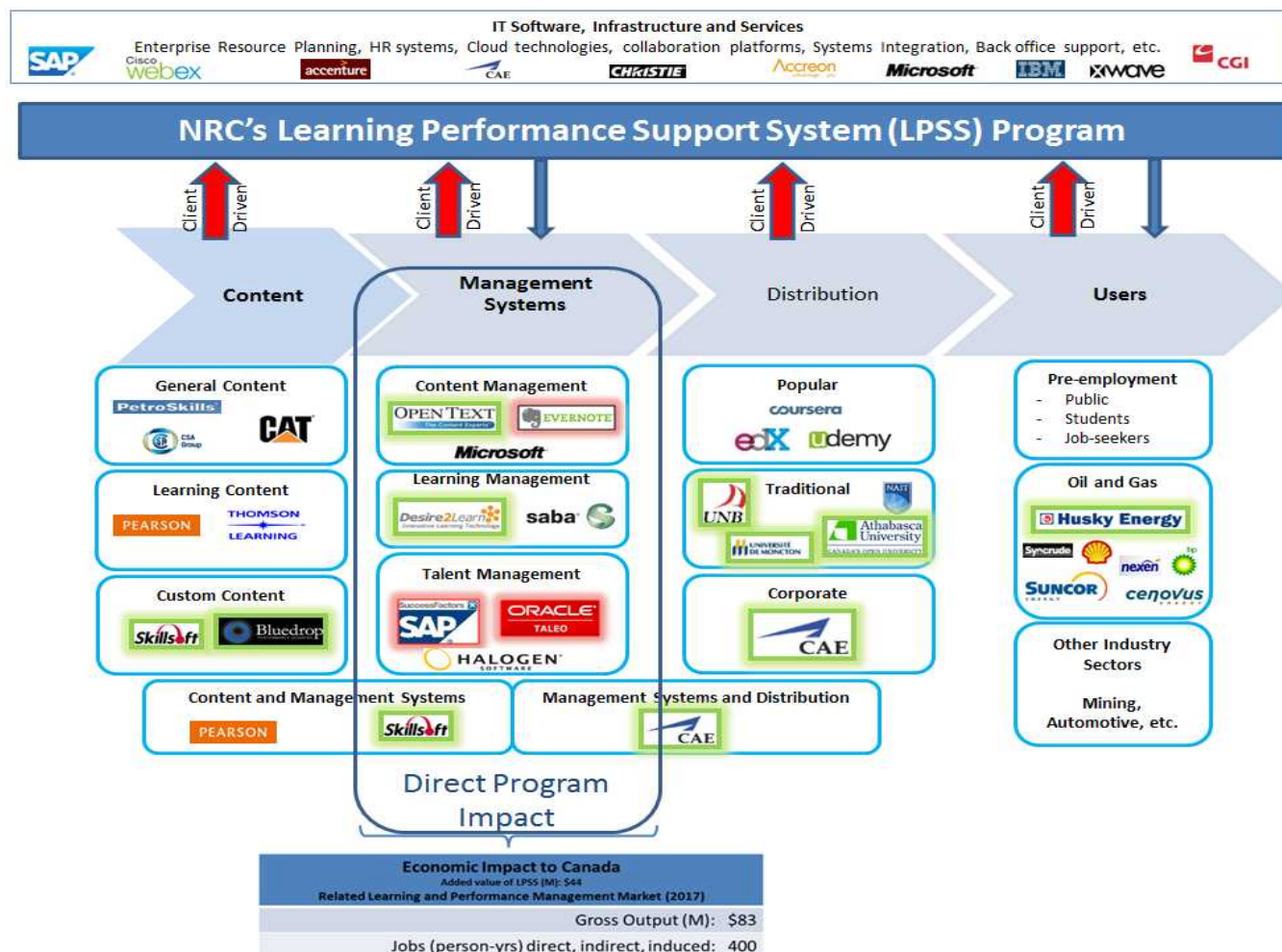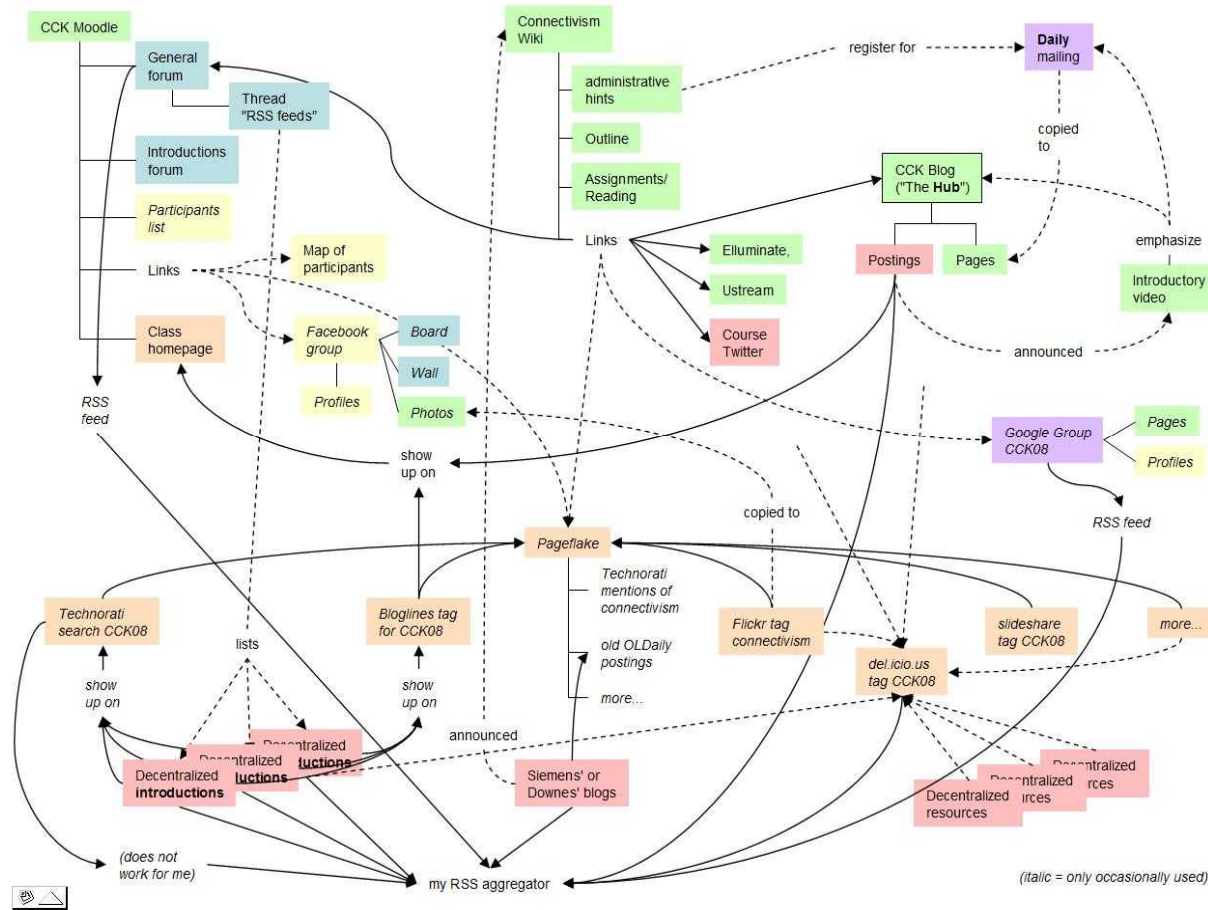 - Neutral broker reduces risk to technology development partners

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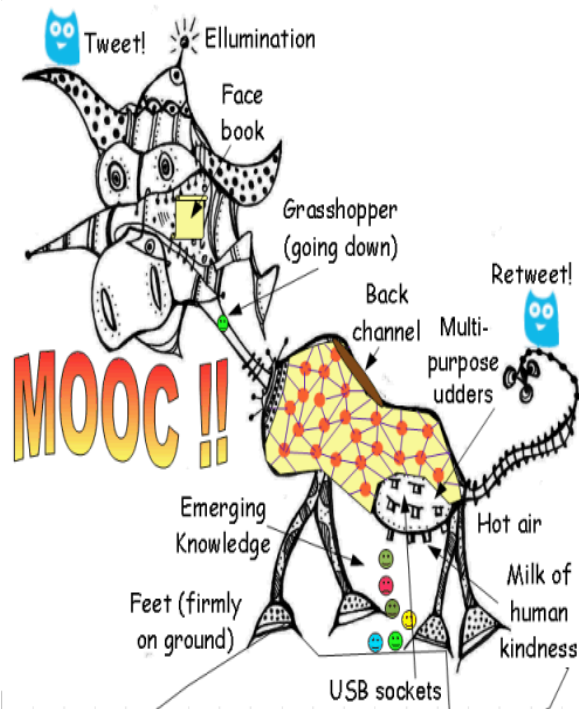- gRSShopper / MOOC / Connectivism
- 2Sim Haptic Simulations

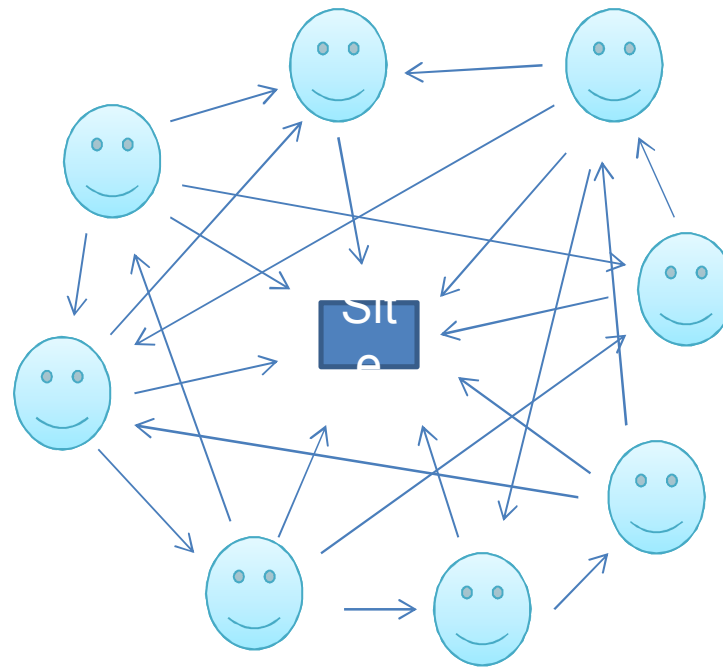# LPSS in Canada's Learning Technology Marketplace

The Connected **Application**

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

Massive – by design

Open – gratis and libre

Online – not blended, not wrapped

Courses – not communities, websites, video collections, etc

A MOOC is a Web, not a Website

Design Principles

Autonomy
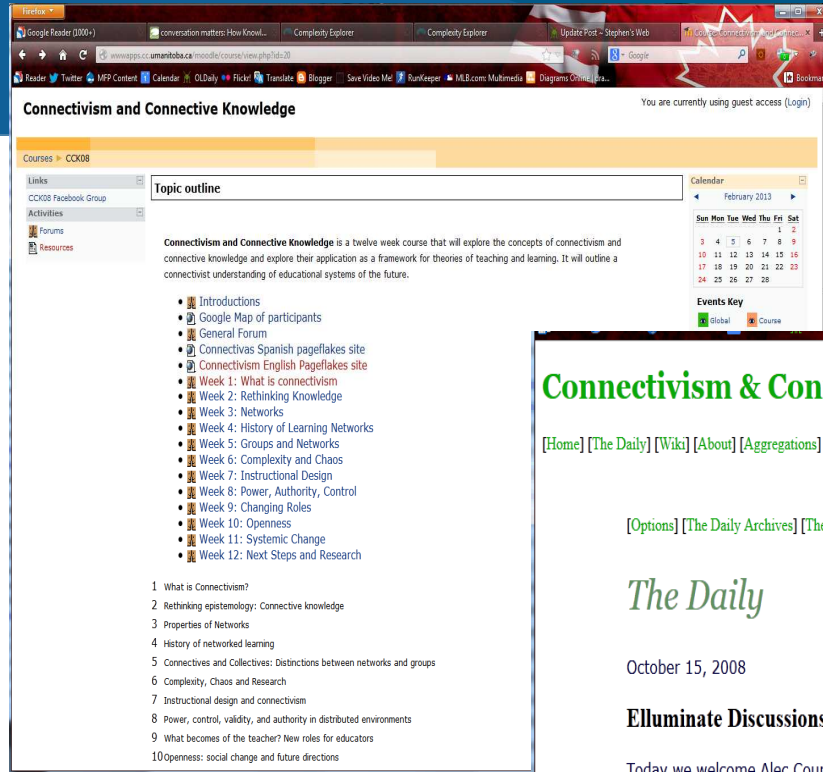- Choice of contents
- Personal learning
- No curriculum

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

Diversity
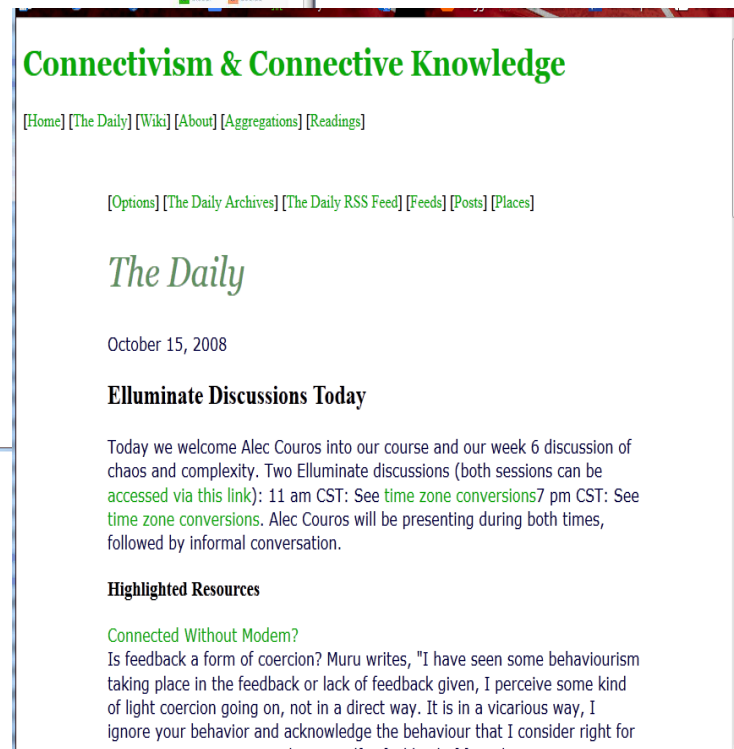- Multiple tools
- Individual perspective
- Varied content

Interactivity
- Encourage communication
- Cooperative learning
- Emergent knowledge

CCK08

http://wwwapps.cc.um anitoba.ca/moodle/cou rse/view.php?id=20

2300 students

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

Other Courses

1800 students
http://connect.downes.ca/

2800 students

http://change.mooc.ca/

3000 students
http://edfuture.net/

cMOOC vs xMOOC

networks   tasks   contents

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

http://ds106.us/history/

https://www.coursera.org/

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

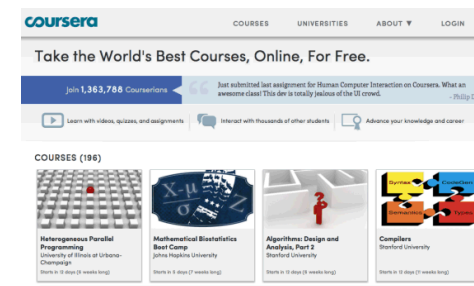# Design principles of the cMOOC

Autonomy, diversity, openness, interactivity

http://itforum.coe.uga.edu/paper92/paper92.html

Aggregate
Remix
Repurpose
Feed Forward

ARRFF

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

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Personal Learning

1. First student creates resource and sends info to course
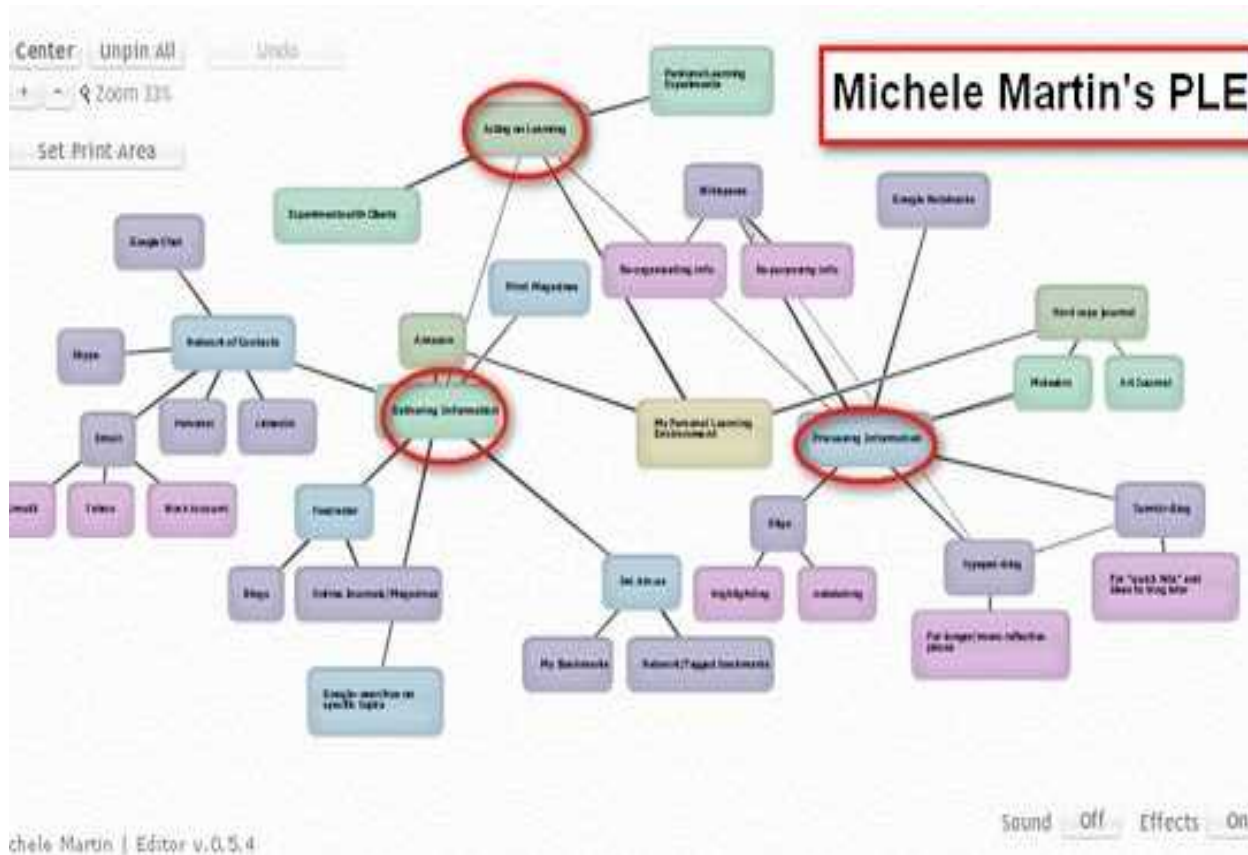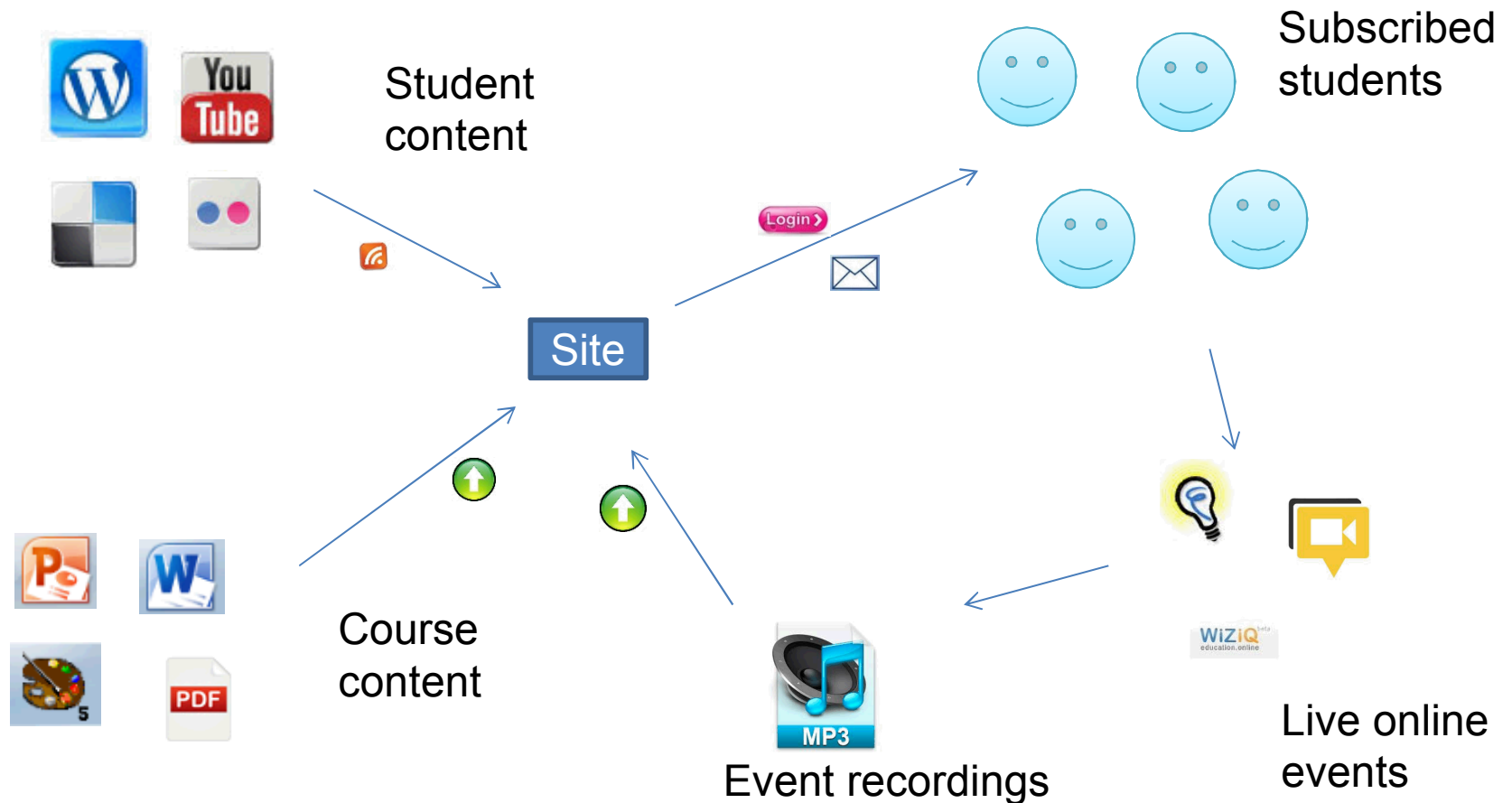
Site

2. Second student sees resource info in newsletter and RSS feed

3. Second student accesses the resource directly
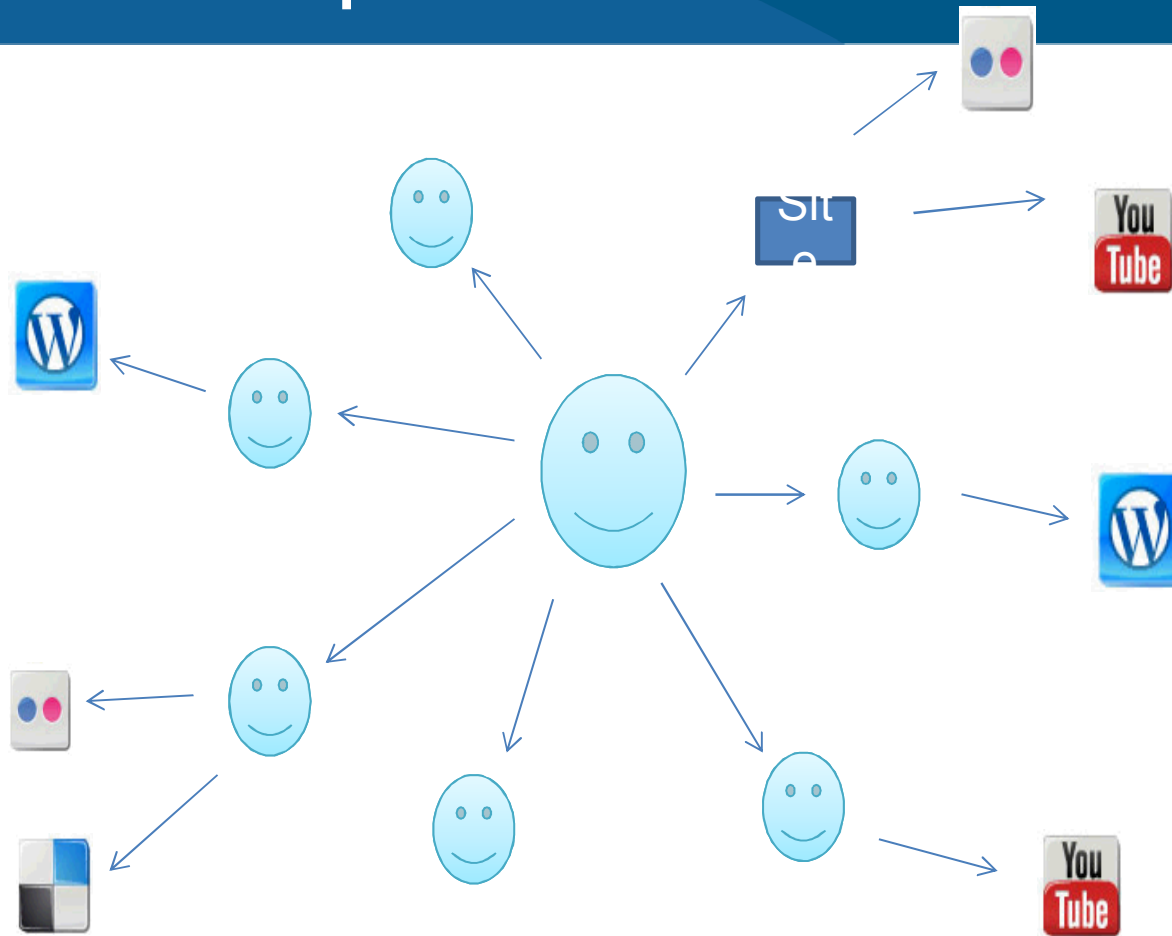
4. Second student finds link to third student's resource

Course Provider Perspective

Student content

Subscribed students

Course content

Event recordings

Live online events

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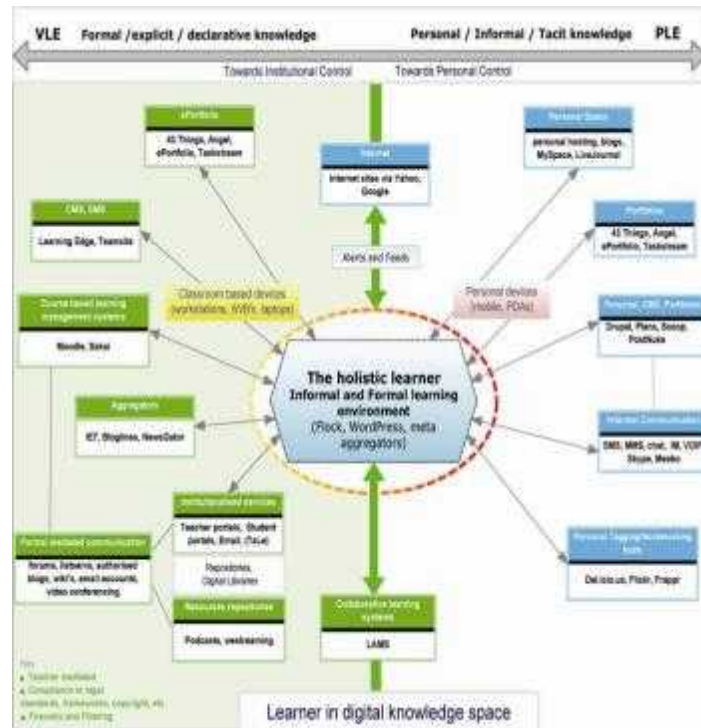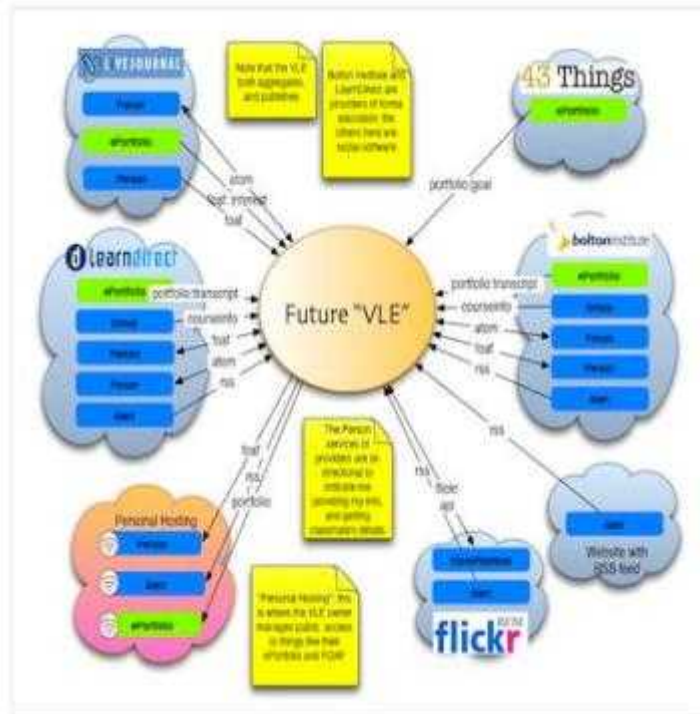
A range of different resources and services

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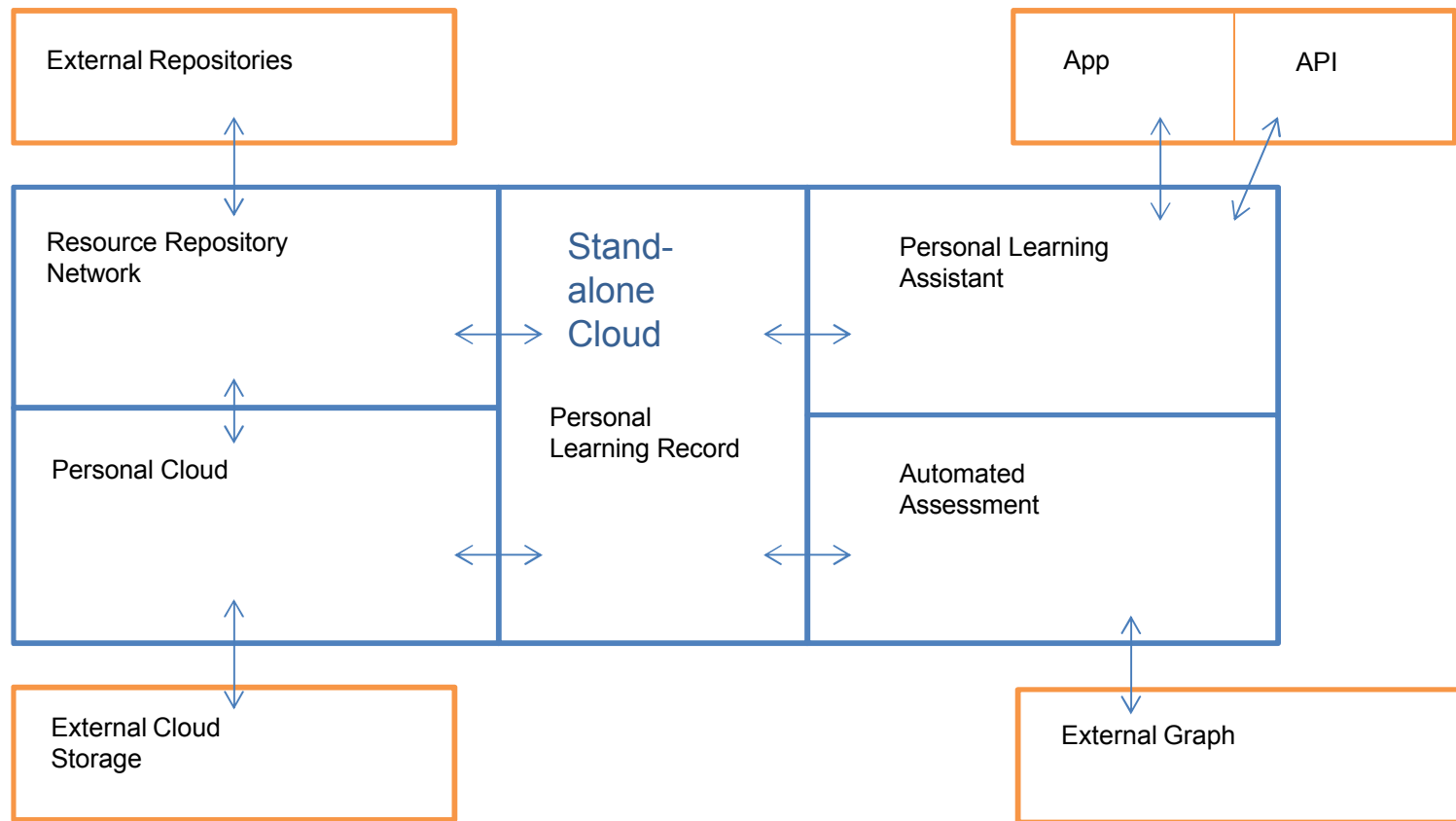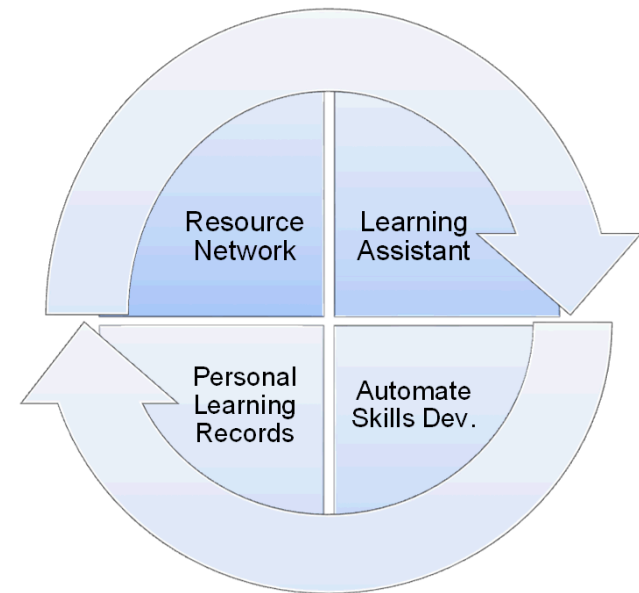http://www.edtechpost.ca/ple_diagrams/index.php/mind-map-3

Simplified Design

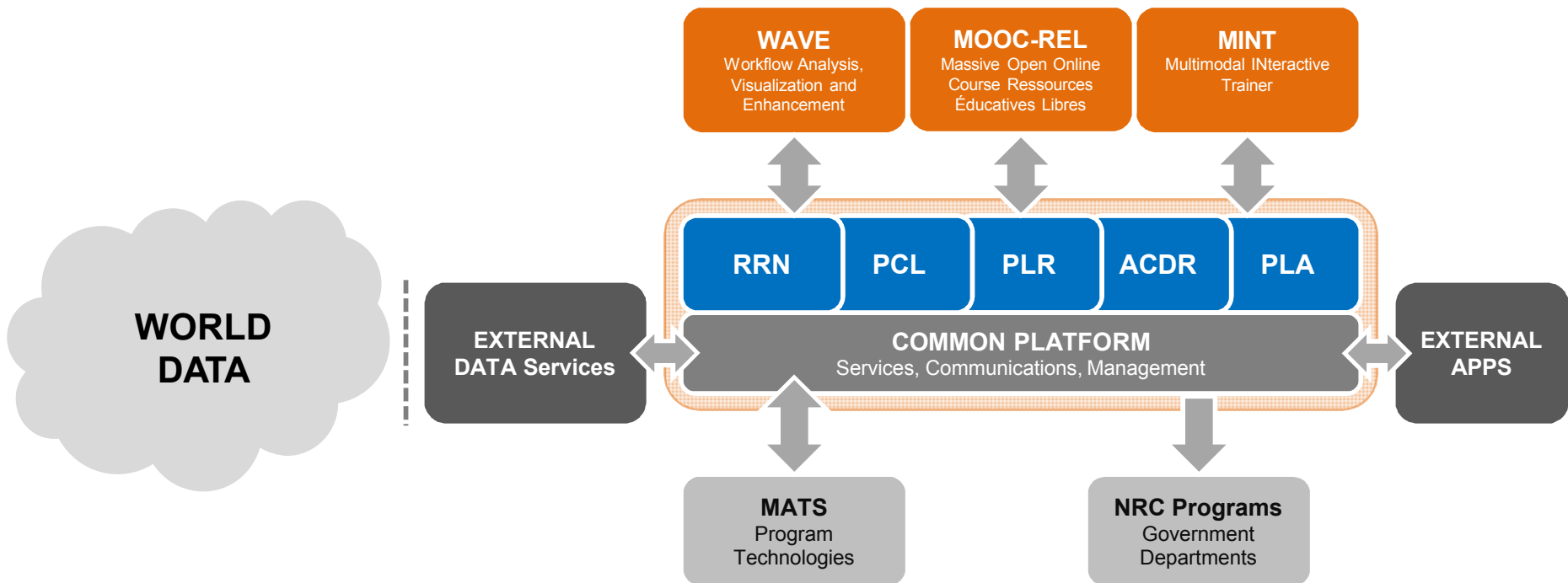# Learning and Performance Support System: Core Technology Development Projects

- 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
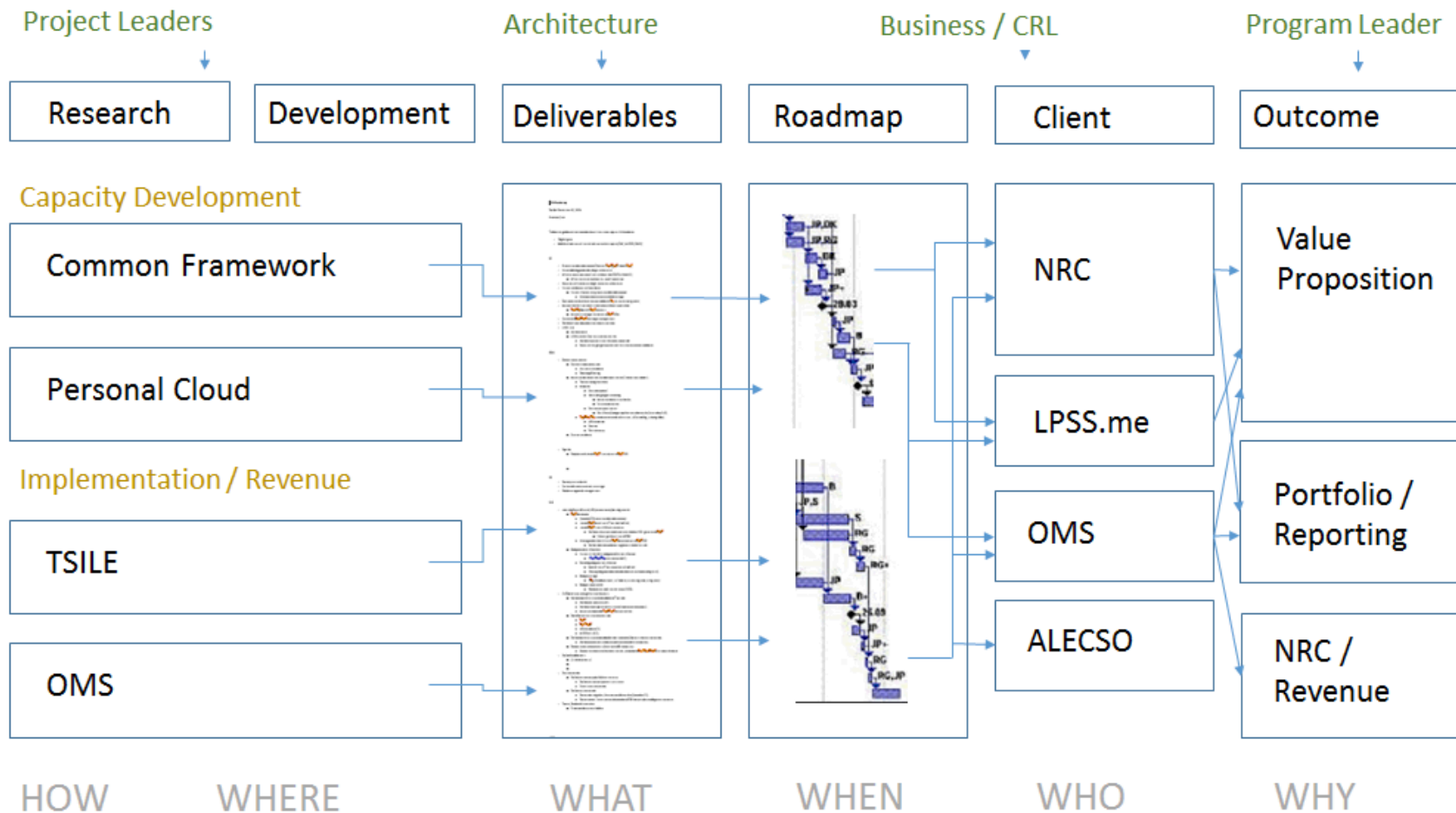
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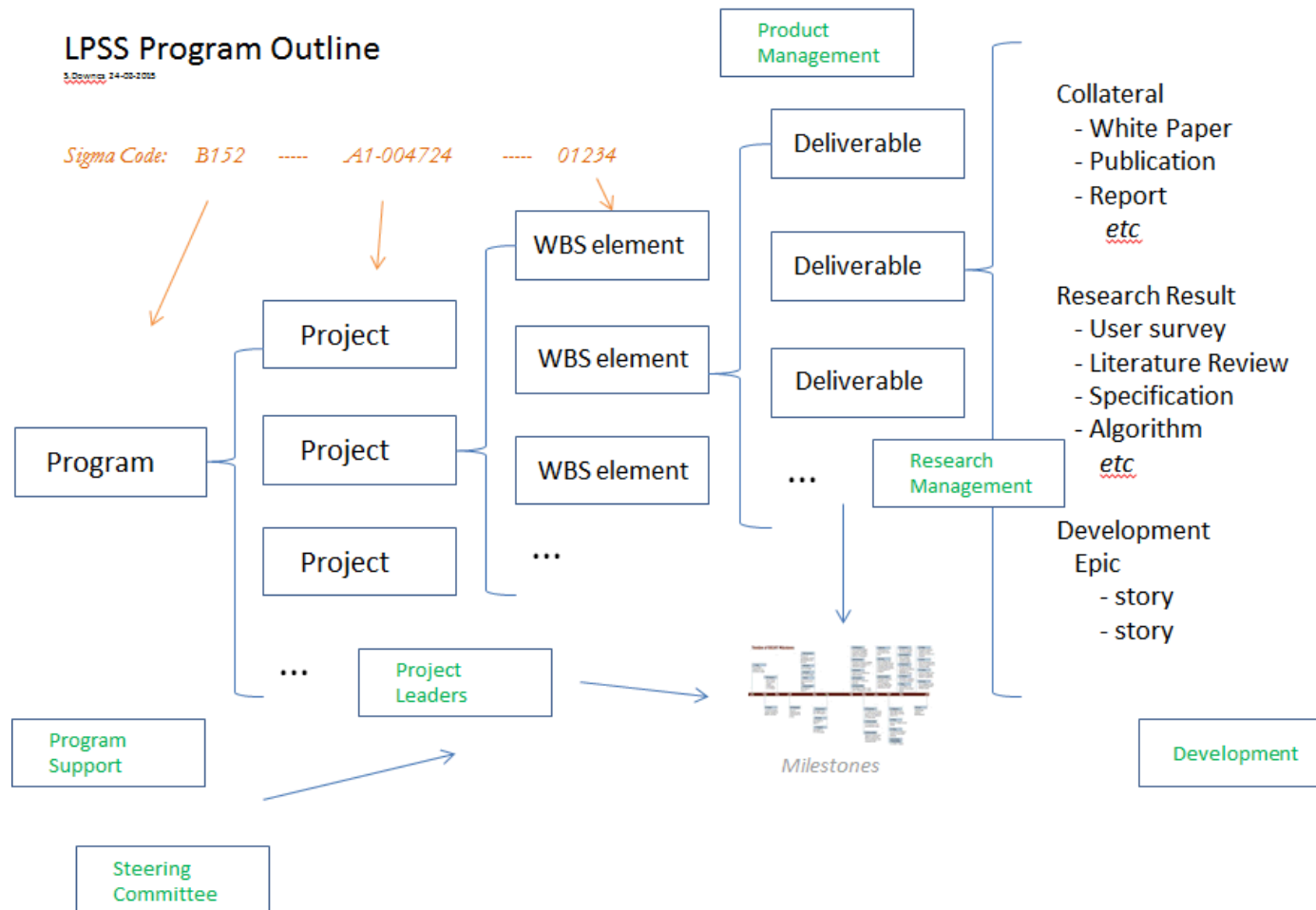# Program Design and Scope

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

Program Organization

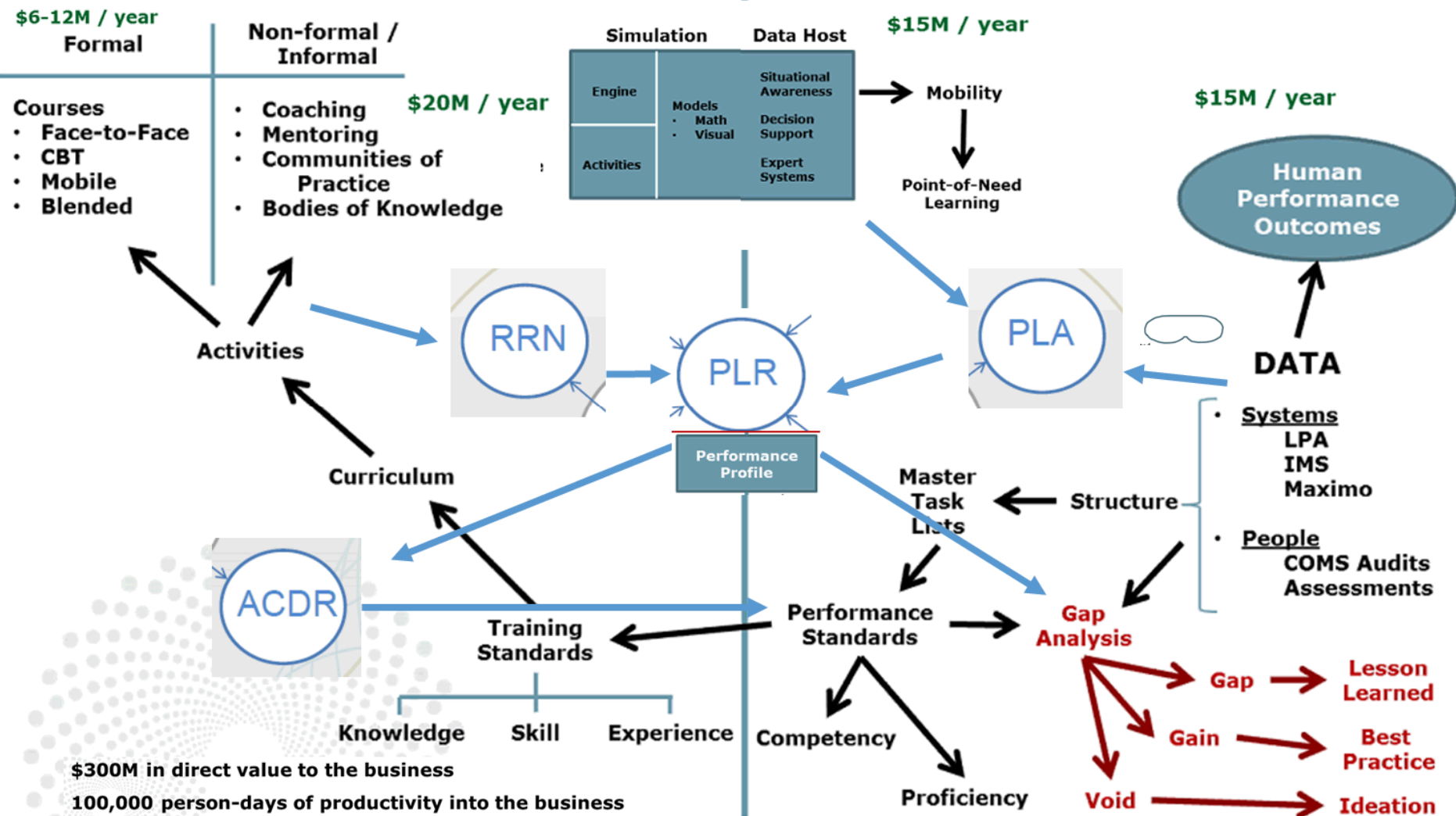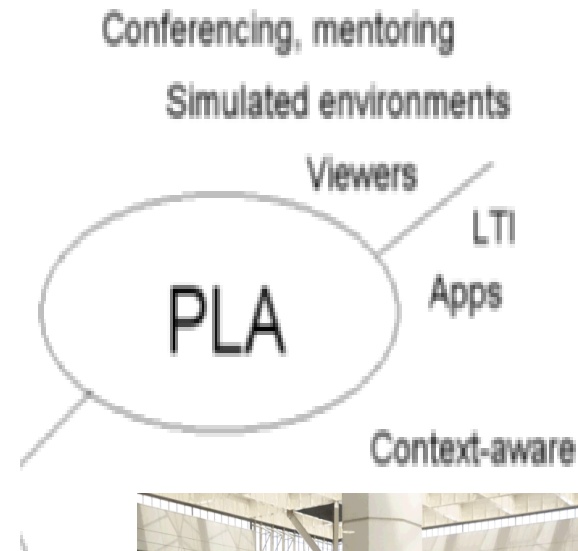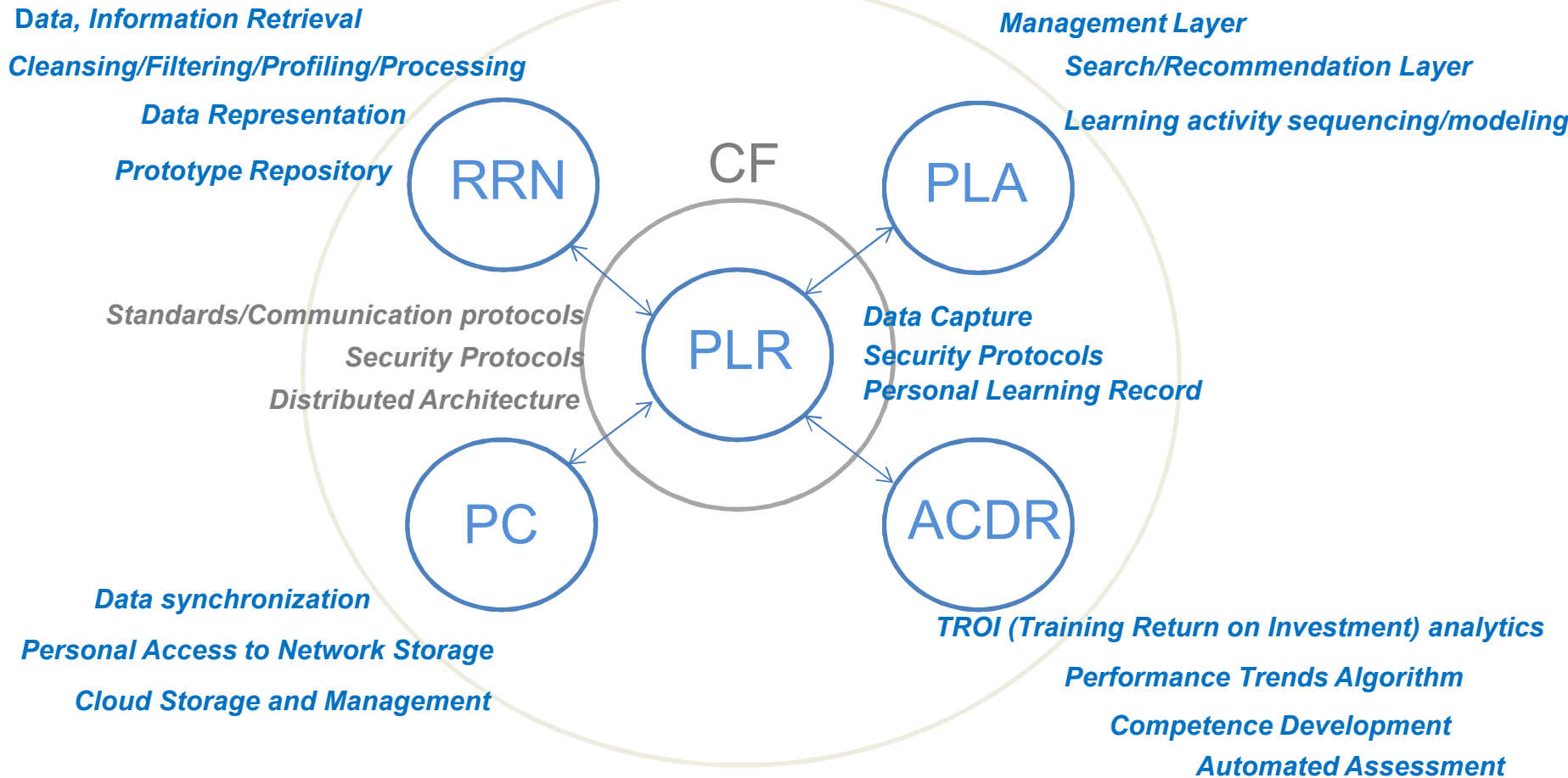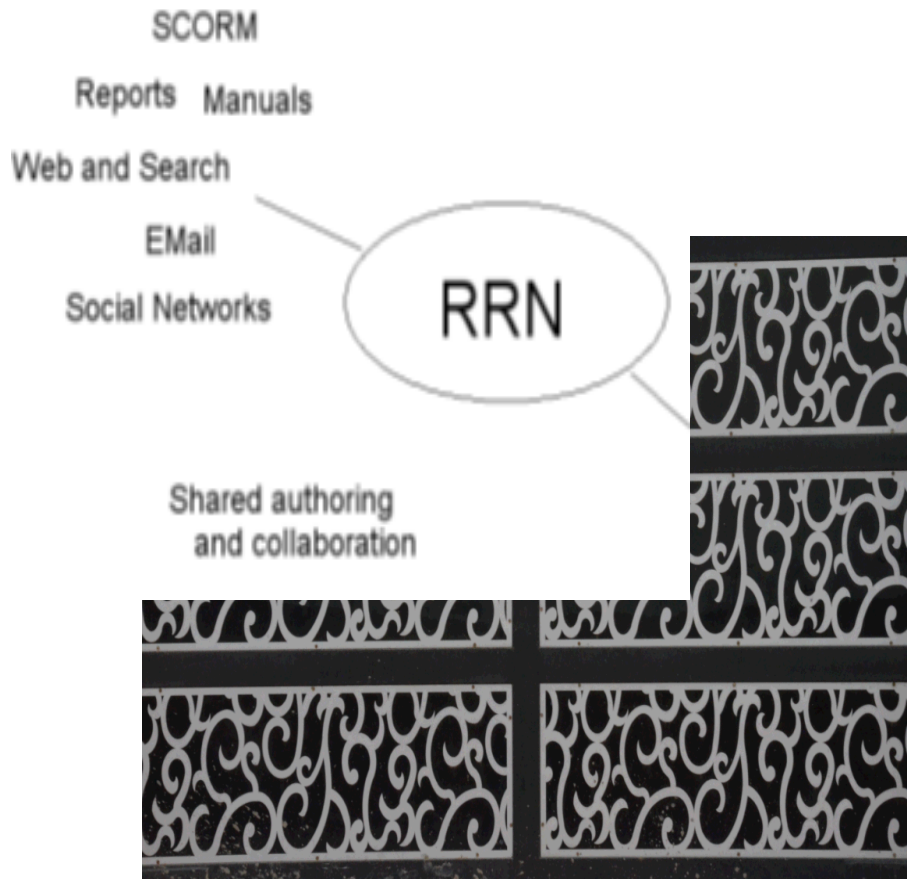# Personal Learning Assistant

- 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

RRN

CF

PLA

PLR

PC

ACDR

Data synchronization

Personal Access to Network Storage

Cloud Storage and Management

TROI (Training Return on Investment) analytics

Performance Trends Algorithm

Competence Development

Automated Assessment

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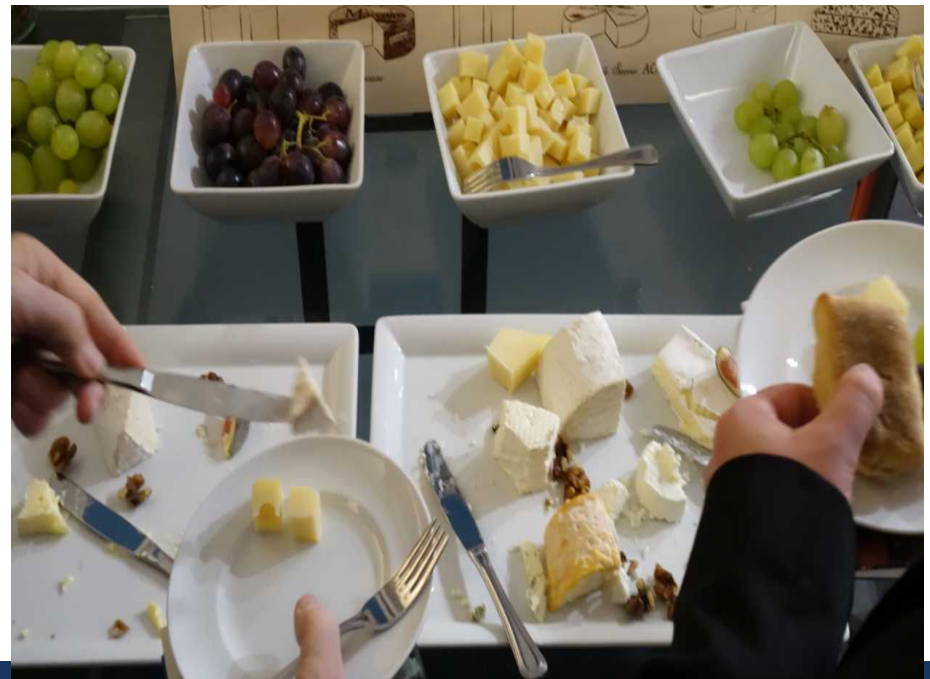
Resource Repository Network

Manage and discover list of sources and resources

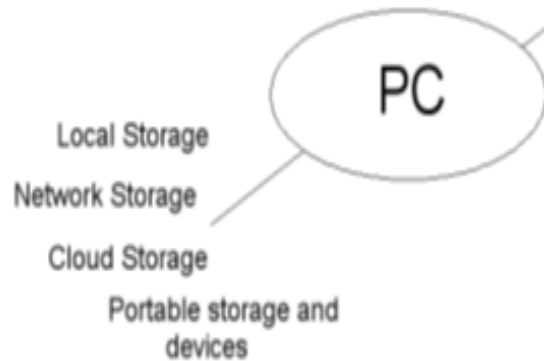Maintain authentication and credentials

Support APIs and metadata standards

Gather, analyze and sort resources and/or metadata

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

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Personal Cloud

Local Storage

Network Storage

Cloud Storage

Portable storage and devices

PC

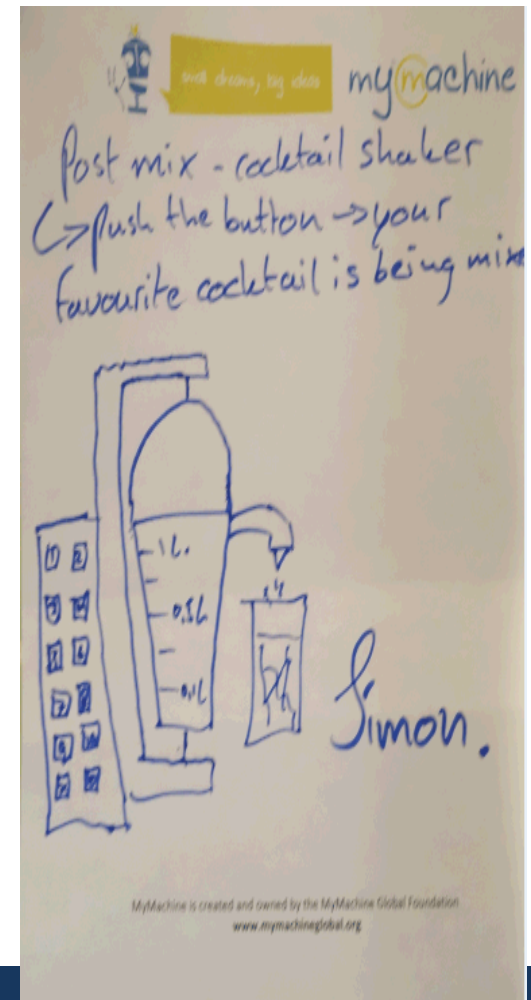Manage list of local and remote storage systems

Maintain security, encryption, authentication and credentials

Include local or personal device storage

Manage and synchronize resource sets and data

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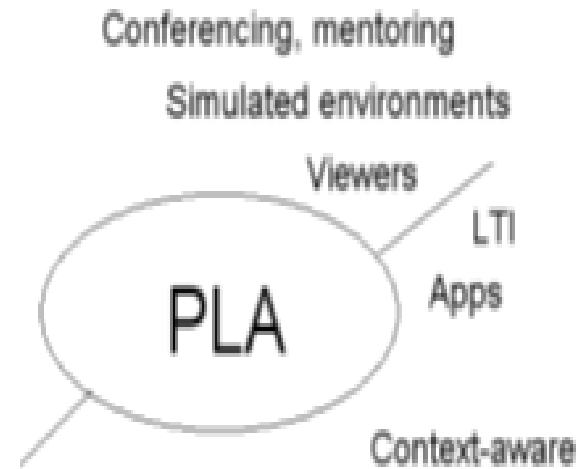# Projection of learning services into multiple platforms

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

Conferencing, mentoring

Simulated environments

Viewers

LTI

Apps

PLA

Context-aware

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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

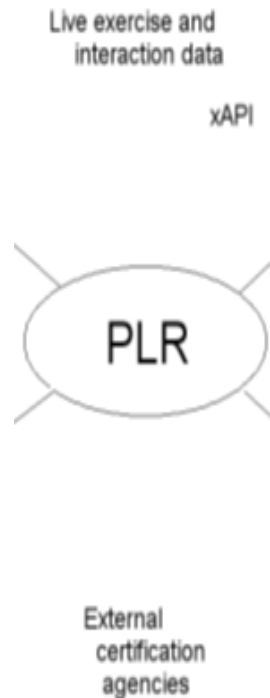# Analytics as a service – analogy with web translation

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

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Personal Learning Record

Live exercise and
interaction data

xAPI

PLR

External
certification
agencies

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

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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

MOOC-REL (OIF)

ALECSO

MINT

PCO Badges

TSILE xAPI

2Sim Simulator xAPI

Workplace T&D

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Implementation Projects

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

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

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Launch Day

http://lpss.me – prototype PLE

Program Implementation Timeline

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