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Design elements in a personal learning environment Downes, Stephen

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Design Elements in a Personal Learning Environment

Stephen Downes
Guadalajara, Mexico
August 17, 2015

Challenges and Opportunities



Technology surrounds us with new opportunities, yet we face historical challenges

... For Institutions



- Changing business models are challenging established institutions
 - Music Industry
 - Publishing Industry
 - Uber, AirBNB
- Centralized design model making it difficult to adapt to changing needs
 - Curricula
 - Standardized Tests
 - Robot Instructors

... For Government and Society

- Skills shortages and productivity gaps
- 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 collage features several news snippets:

- Parliament of Canada:** A report titled "LABOUR AND SKILLS SHORTAGE ADDRESSING CURRENT AND FUTURE CHALLENGES" by Ed Komarnicki, M.P., dated December 2012, 41st Parliament, First Session. It discusses the report of the Standing Committee on Human Resources, Skills and Social Development and the Status of Persons with Disabilities.
- Ottawa Citizen:** An article titled "An answer to Canada's mining skills shortage" by Daniel Bland, dated August 26, 2013. It mentions that while economists and labour market researchers agree on one of Canada's greatest worker shortages, the answer is not that simple.
- Economy Lab:** A report titled "Canada's labour pain: 1.3 million jobless, but not enough skills" by Tavia Grant, dated March 31, 2013. It notes that the labour market is not doing well, with 1.3 million people unemployed.
- itbusiness.ca:** An article titled "IT skills shortage still a problem in Canada" published on July 10th, 2013. It discusses the ongoing issue of IT skills shortages in the Canadian market.
- Canadian Business Journal:** An article titled "Advanced Skills Shortages in Canada – Getting to the Root of the Problem" from March 09. It mentions a report from the Canadian Chamber of Commerce published in November of the previous year, highlighting the skills shortage as a critical economic issue.

... For Individual Learners



- Access to learning opportunities remain elusive
- The cost of tuition and textbooks is too high
- Learning and development needs continue after graduation
- Difficulties exist in finding employment and matching skills to opportunities

Our Approach: Personal Learning and Performance Support Systems

Single point of access
to all skills development
and training needs

- It's personal and you carry it with you
- It's a network – we don't put everything in one package
- Different types of things, not just courses:
 - Access to learning resources
 - Calling cards and communications
 - Credentials, permits and licenses



Why NRC? Our Distinct Leverage

- NRC is a globally recognized leader in emerging learning technologies
 - LPSS benefits from NRC's research in other fields
- NRC is deeply connected to the e-learning 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 (commercialized as RACOFI)
- SHARE Sentiment Analysis
- Synergic3 Collaborative Workflow (commercialized with Desire2Learn)
- gRSShopper / MOOC / Connectivism
- 2Sim Haptic Simulations

Tweet!

Ellumination

Face book

Grasshopper (going down)

Back channel

Multi-purpose udders

Hot air

Milk of human kindness

USB sockets

Feet (firmly on ground)

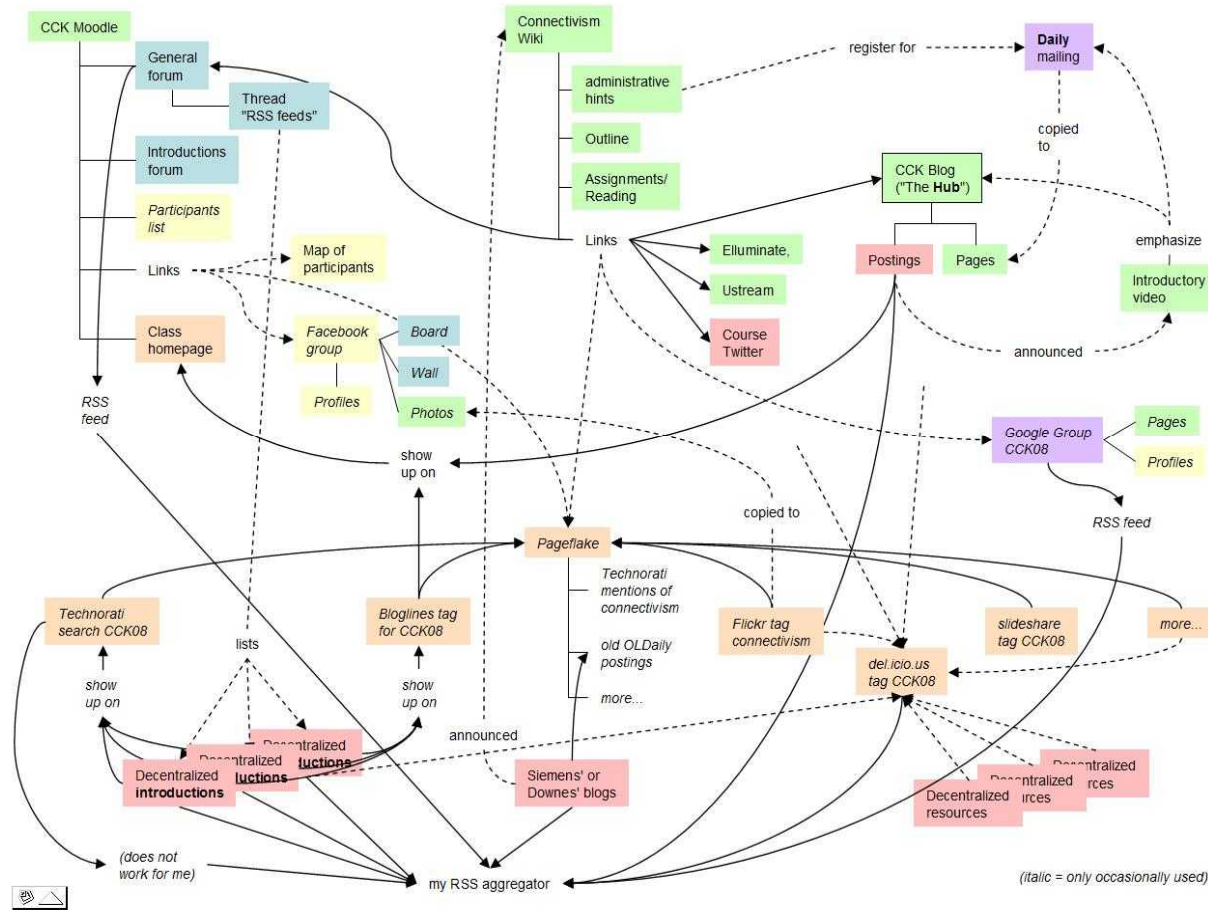
Emerging Knowledge

MOOC !!

Retweet!

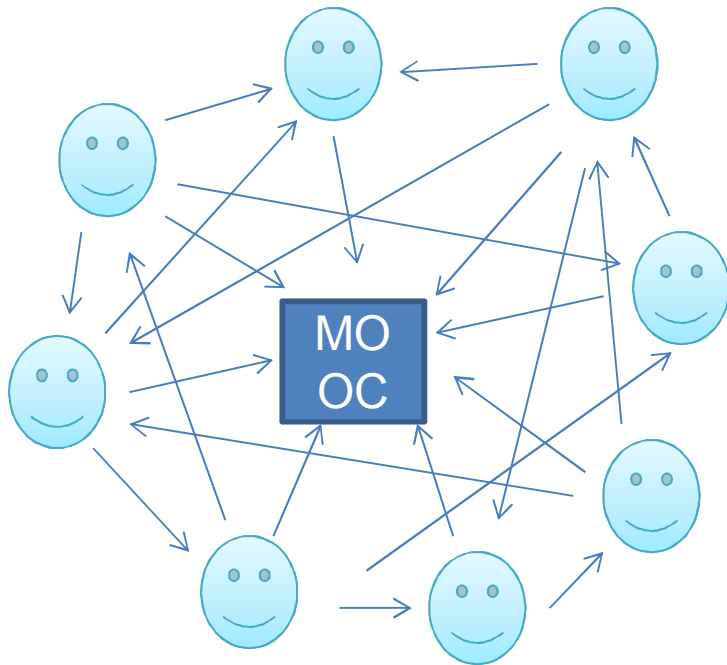
Courses – not communities, websites, video collections, etc

MOOC as Connected Applications



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

MOOC as One Part of a Wider Network



To us, a MOOC was not a single website or application, but instead, a way of connecting people to *each other* in order to share and learn cooperatively

CCK08

Connectivism and Connective Knowledge

You are currently using guest access (Login)

Courses > CCK08

Links

- CCK08 Facebook Group
- Activities
- Forums
- Resources

Topic outline

Connectivism and Connective Knowledge is a twelve week course that will explore the concepts of connectivism and connective knowledge and explore their application as a framework for theories of teaching and learning. It will outline a connectivist understanding of educational systems of the future.

- Introductions
- Google Map of participants
- General Forum
- Connectivas Spanish pagelakes site
- Connectivism English Pagelakes site
- Week 1: What is connectivism
- Week 2: Rethinking Knowledge
- Week 3: Networks
- Week 4: History of Learning Networks
- Week 5: Groups and Networks
- Week 6: Complexity and Chaos
- Week 7: Instructional Design
- Week 8: Power, Authority, Control
- Week 9: Changing Roles
- Week 10: Openness
- Week 11: Systemic Change
- Week 12: Next Steps and Research

- 1 What is Connectivism?
- 2 Rethinking epistemology: Connective knowledge
- 3 Properties of Networks
- 4 History of networked learning
- 5 Connectives and Collectives: Distinctions between networks and groups
- 6 Complexity, Chaos and Research
- 7 Instructional design and connectivism
- 8 Power, control, validity, and authority in distributed environments
- 9 What becomes of the teacher? New roles for educators
- 10 Openness: social change and future directions

<http://wwwapps.bluewin.ch/anitoba.ca/moodle/course/view.php?id=20>

2300 students

Connectivism & Connective Knowledge

[Home] [The Daily] [Wiki] [About] [Aggregations] [Readings]

[Options] [The Daily Archives] [The Daily RSS Feed] [Feeds] [Posts] [Places]

The Daily

October 15, 2008

Illuminate Discussions Today

Today we welcome Alec Couros into our course and our week 6 discussion of chaos and complexity. Two Illuminate discussions (both sessions can be [accessed via this link](#)): 11 am CST: See [time zone conversions](#) 7 pm CST: See [time zone conversions](#). Alec Couros will be presenting during both times, followed by informal conversation.

Highlighted Resources

[Connected Without Modem?](#)

Is feedback a form of coercion? Muru writes, "I have seen some behaviourism taking place in the feedback or lack of feedback given, I perceive some kind of light coercion going on, not in a direct way. It is in a vicarious way, I ignore your behavior and acknowledge the behaviour that I consider right for

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

Other Courses



PLENK2010
Personal Learning Environments
Networks and Knowledge 2010

home discussion wiki the daily blog live sessions recordings about

Schedule

WEEK OF...
12TH SEPTEMBER 2010
[A TOUR OF PLES AND PLNS](#)

19TH SEPTEMBER 2010
[CONTRASTING PLES WITH LMSS](#)

26TH SEPTEMBER 2010
[THE NEXT/EXTENDED WEB](#)

3RD OCTOBER 2010
[PLE/PLN AND LEARNING THEORIES](#)

10TH OCTOBER 2010
[EVALUATING LEARNING IN PLE/NS](#)

17TH OCTOBER 2010
[USING PLES SUCCESSFULLY](#)

24TH OCTOBER 2010
[PLE/N TOOLS](#)

31ST OCTOBER 2010
[PERSONAL KNOWLEDGE](#)

Welcome to the Course

YOU ARE LOGGED IN AS [NAME] [LOGOUT]

SEE I CAN PLENK, YOO!

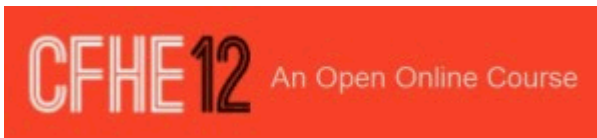
PLENK 2010

If you would like to register for PLENK2010 there's still time. [Click here to Register](#)

If you have subscribed to The Daily, then you will receive the newsletter.

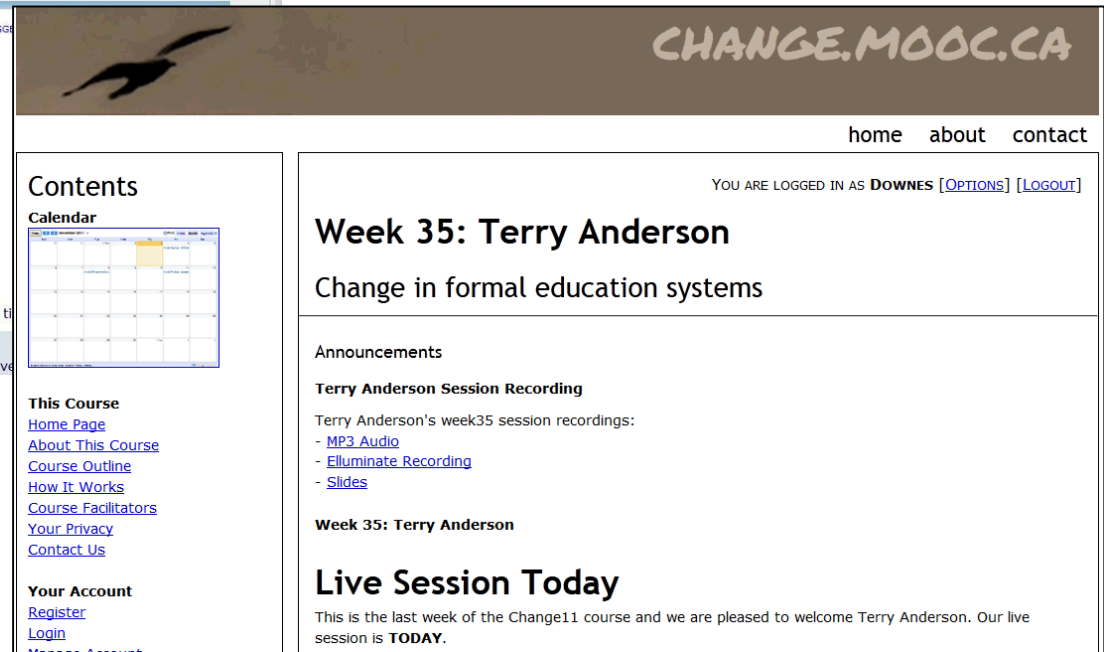
1800 students

<http://connect.downes.ca/>



3000 students

<http://edfuture.net/>



CHANGE.MOOC.CA

home about contact

YOU ARE LOGGED IN AS DOWNES [OPTIONS] [LOGOUT]

Week 35: Terry Anderson
Change in formal education systems

Announcements

Terry Anderson Session Recording

Terry Anderson's week35 session recordings:

- [MP3 Audio](#)
- [Eliminate Recording](#)
- [Slides](#)

Week 35: Terry Anderson

Live Session Today

This is the last week of the Change11 course and we are pleased to welcome Terry Anderson. Our live session is **TODAY**.

Contents

Calendar

This Course

- [Home Page](#)
- [About This Course](#)
- [Course Outline](#)
- [How It Works](#)
- [Course Facilitators](#)
- [Your Privacy](#)
- [Contact Us](#)

Your Account

- [Register](#)
- [Login](#)
- [Manage Account](#)

2800 students

<http://change.mooc.ca/>

cMOOC vs xMOOC



networks

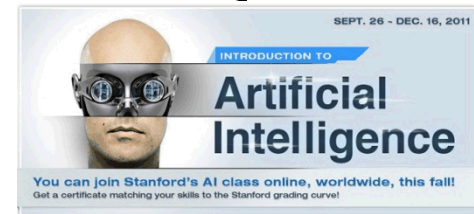
tasks

content

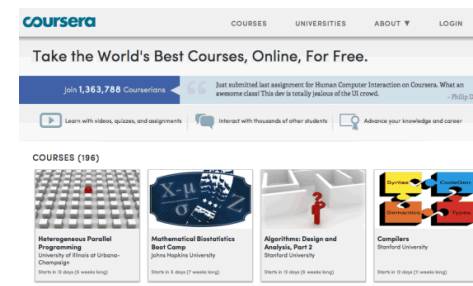
c



<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

Autonomy

- Choice of contents
- Personal learning
- No curriculum

Openness

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

Diversity

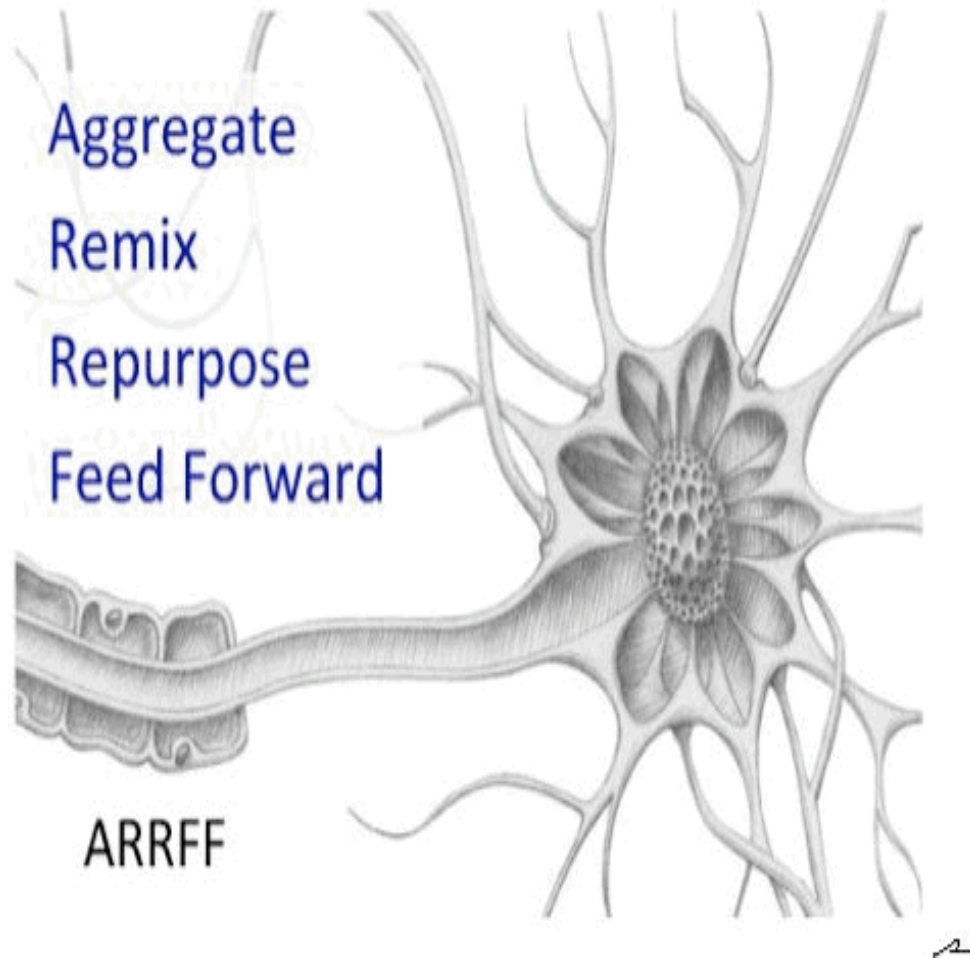
- Multiple tools
- Individual perspective
- Varied content

Interactivity

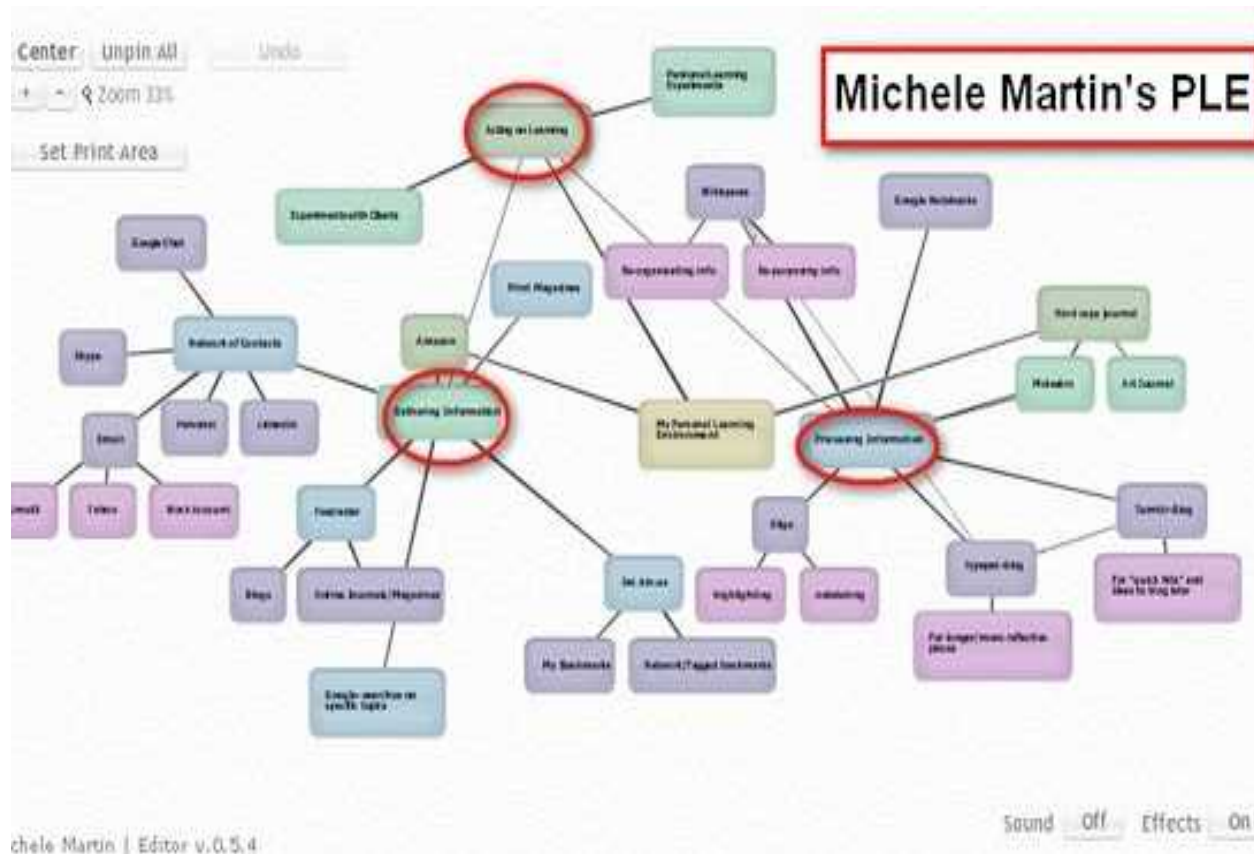
- Encourage communication
- Cooperative learning
- Emergent knowledge

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

Pedagogy of the cMOOC



Personal Learning



<http://dmlcentral.net/blog/howard-rheingold/diy-u-interview-anyakamenetz> <http://www.downes.ca/post/58150>

Underlying MOOC Support

1. First student creates resource and sends info to course



Site

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

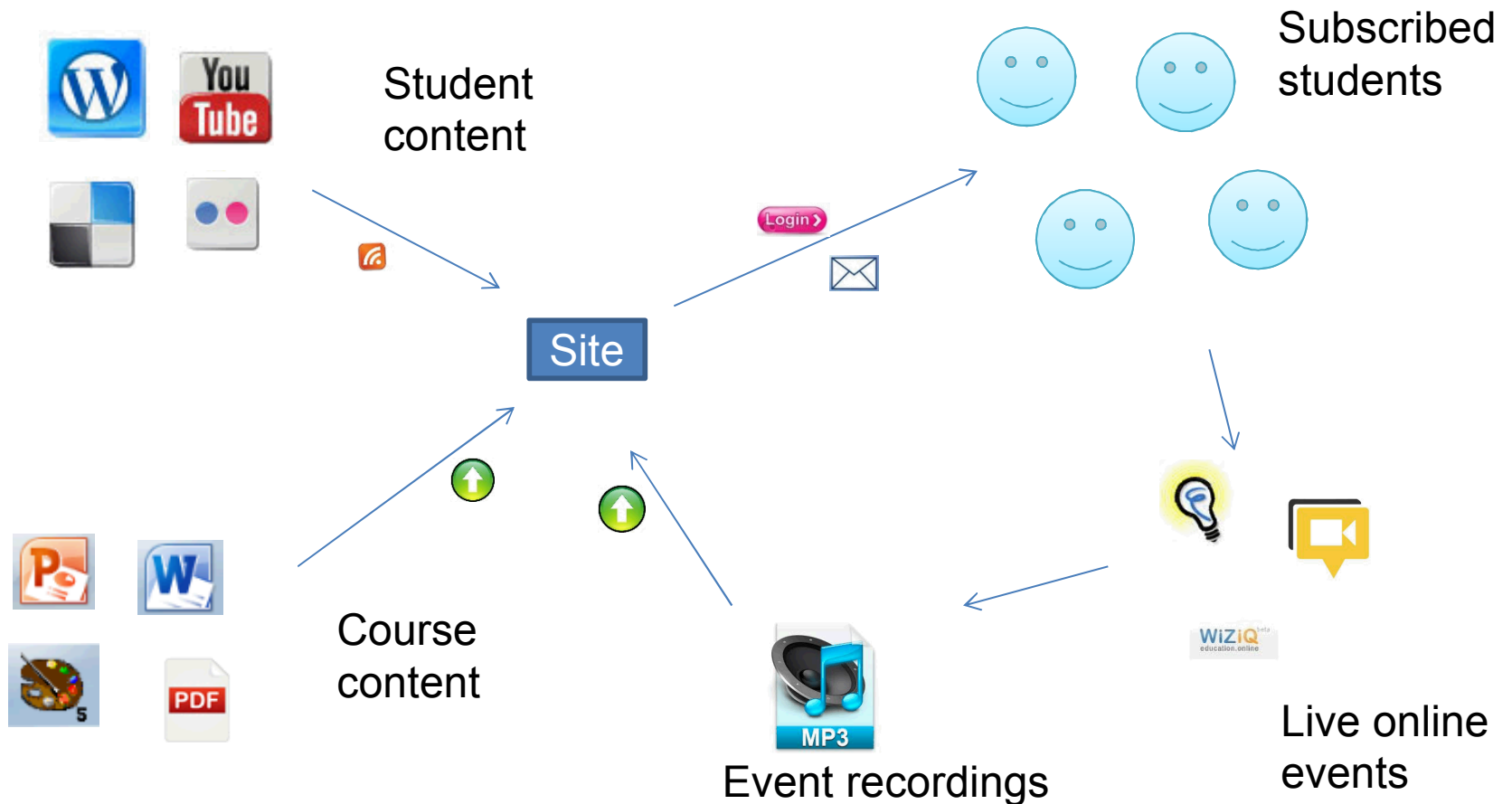


3. Second student accesses the resource directly

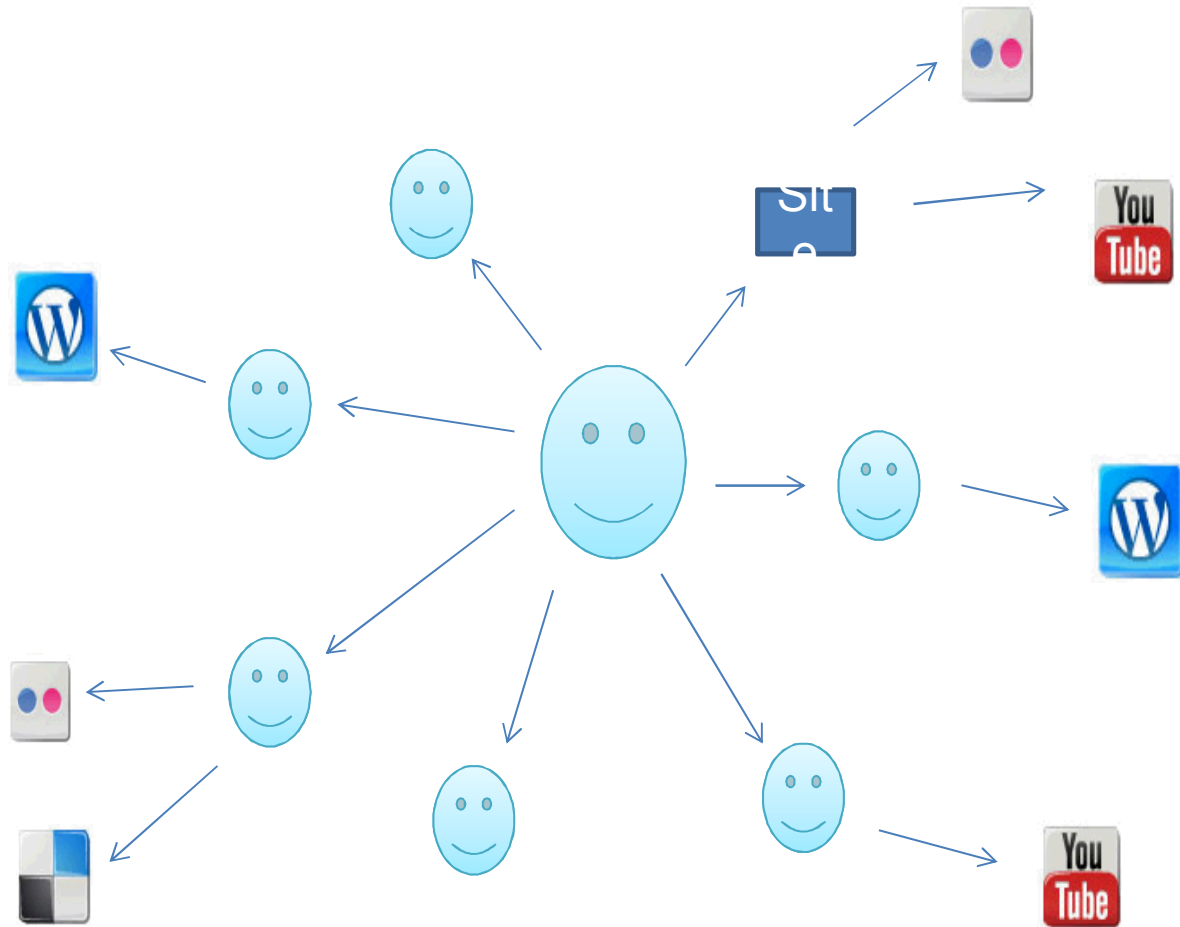


4. Second student finds link to third student's resource

Course Provider Perspective

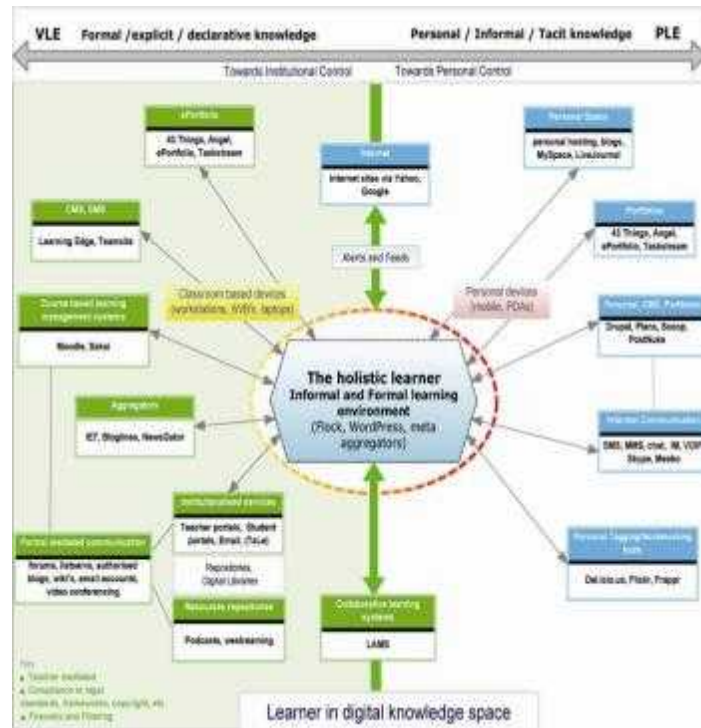
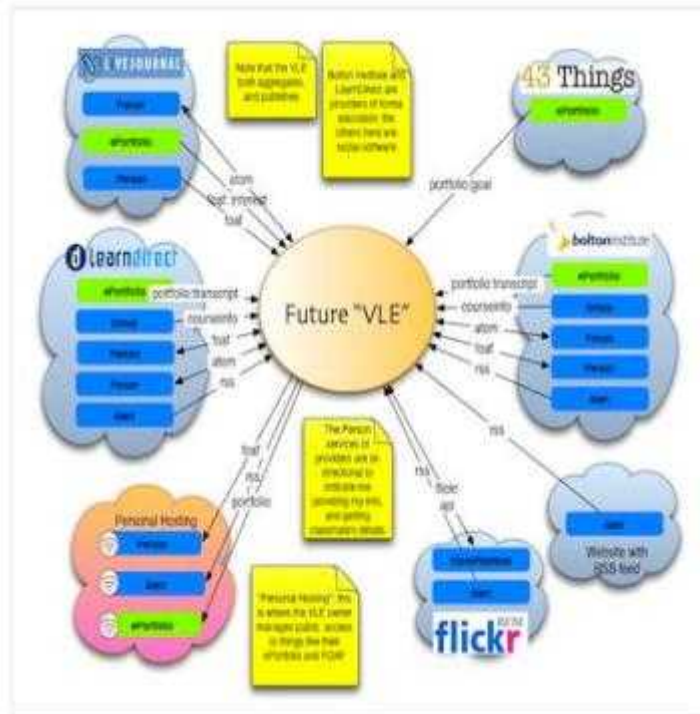


The Student's Perspective



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

LPSS is Built Around the Personal Learning Record

This is a *new* type of data – we call it the *personal graph*.

Each person has their own *private* personal graph.

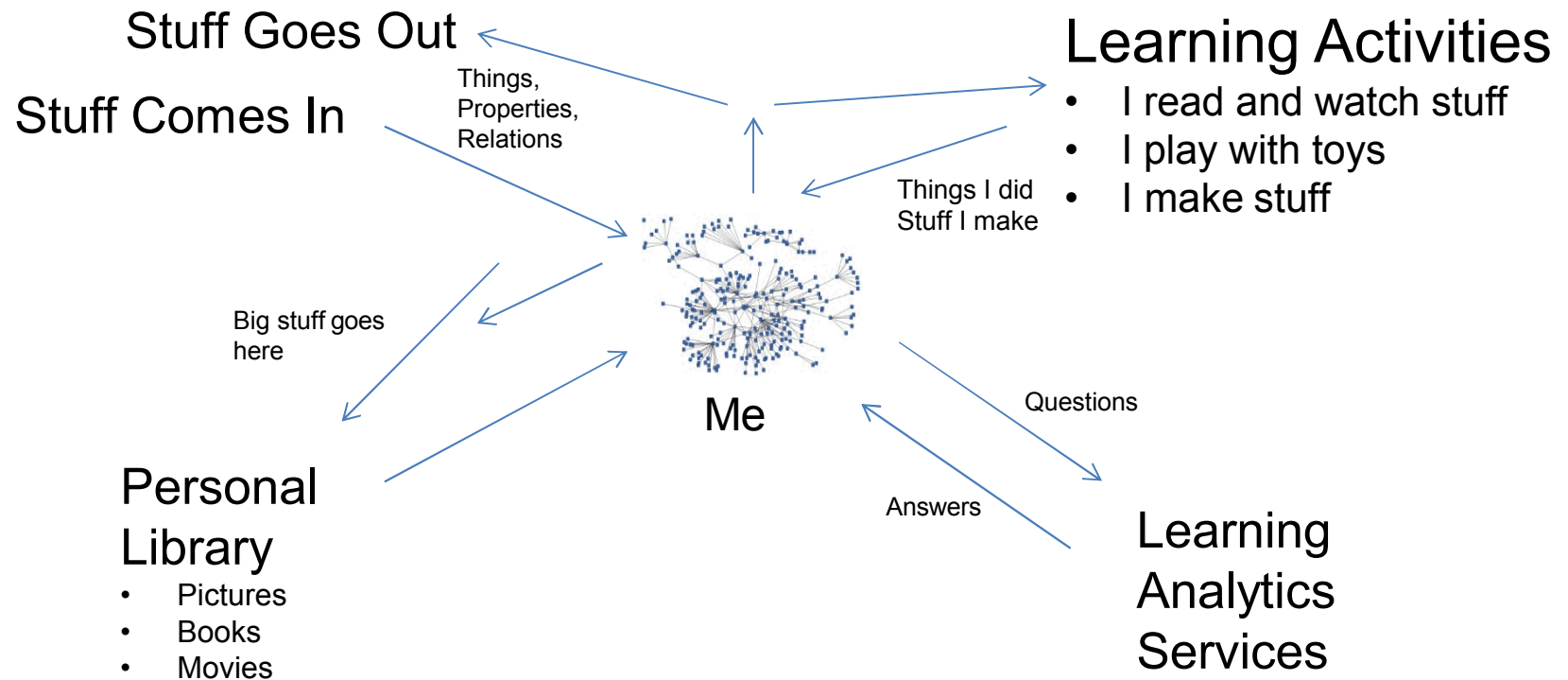


Me

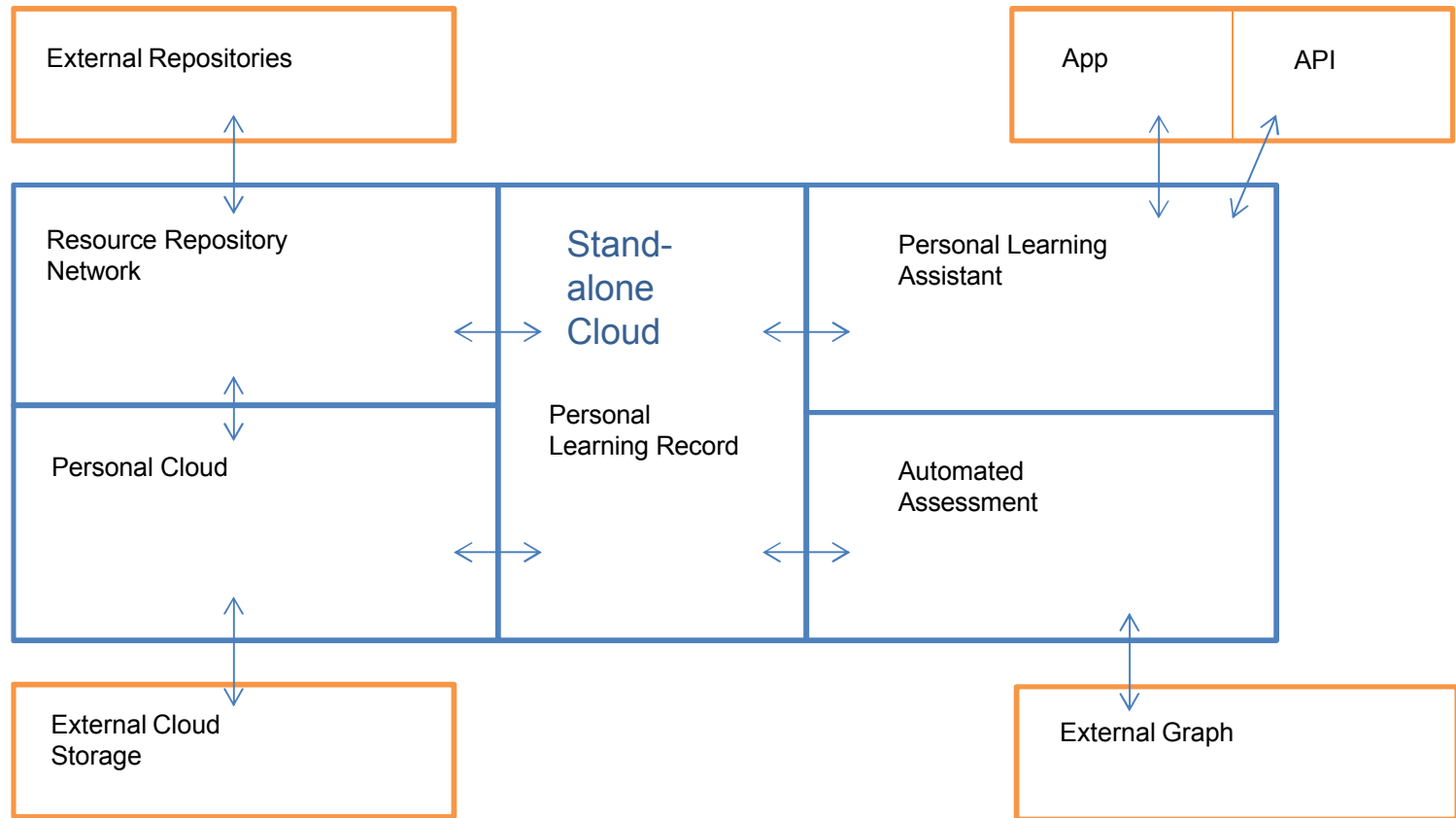
The PLR contains all a person's learning records, including:

- certificates, badges and credentials
- activity records, test results, scores
- Assignments, papers, drawings, things they create

LPSS is Built Around the Personal Learning Record

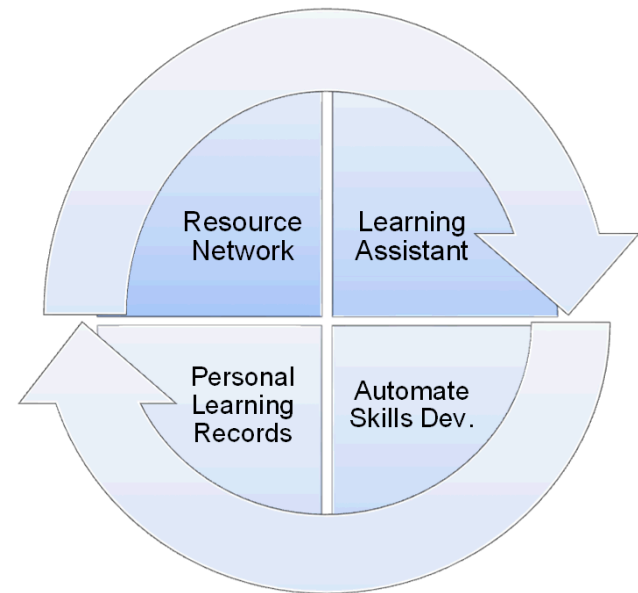


Simplified Design of the LPSS Personal Learning Architecture

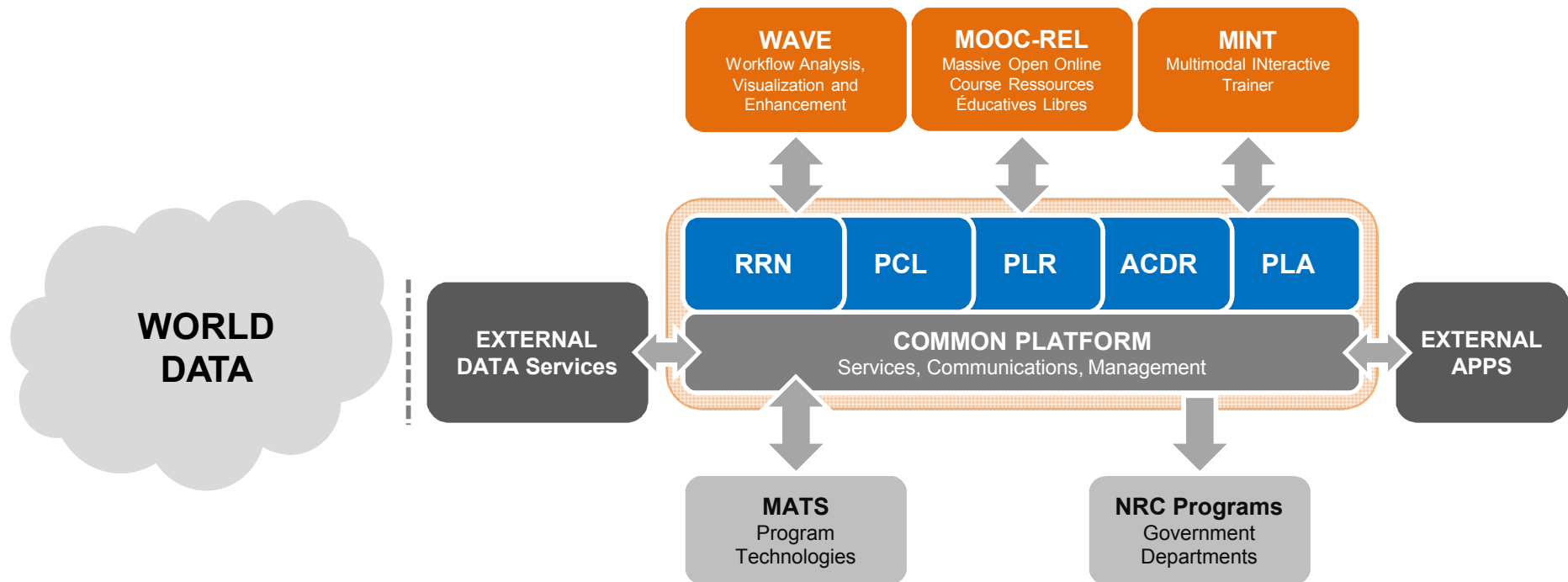


Learning and Performance Support System: Core Technology Development Projects

- 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
- Simulations and Tools



Program Design and Scope

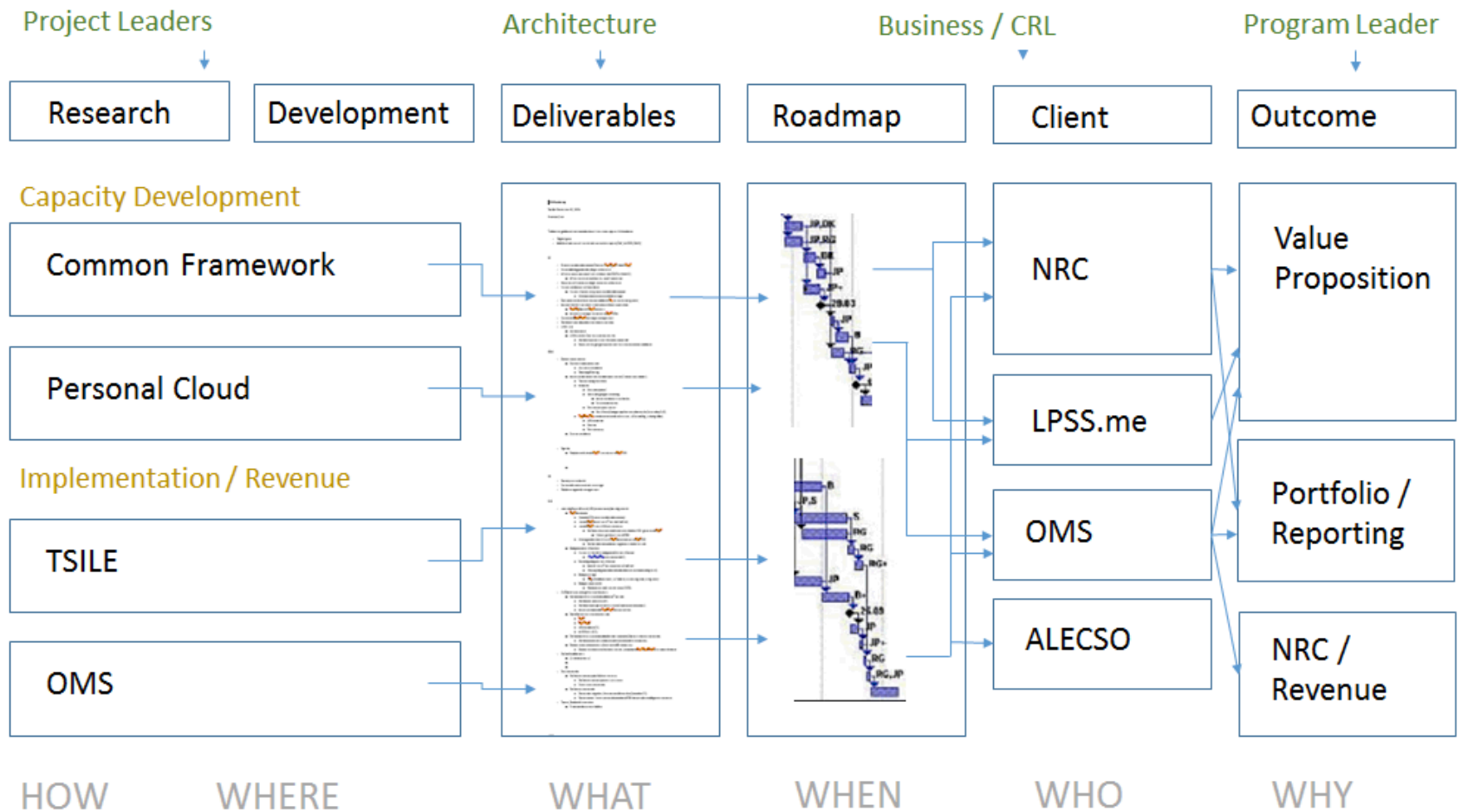


Blue: Core technology projects

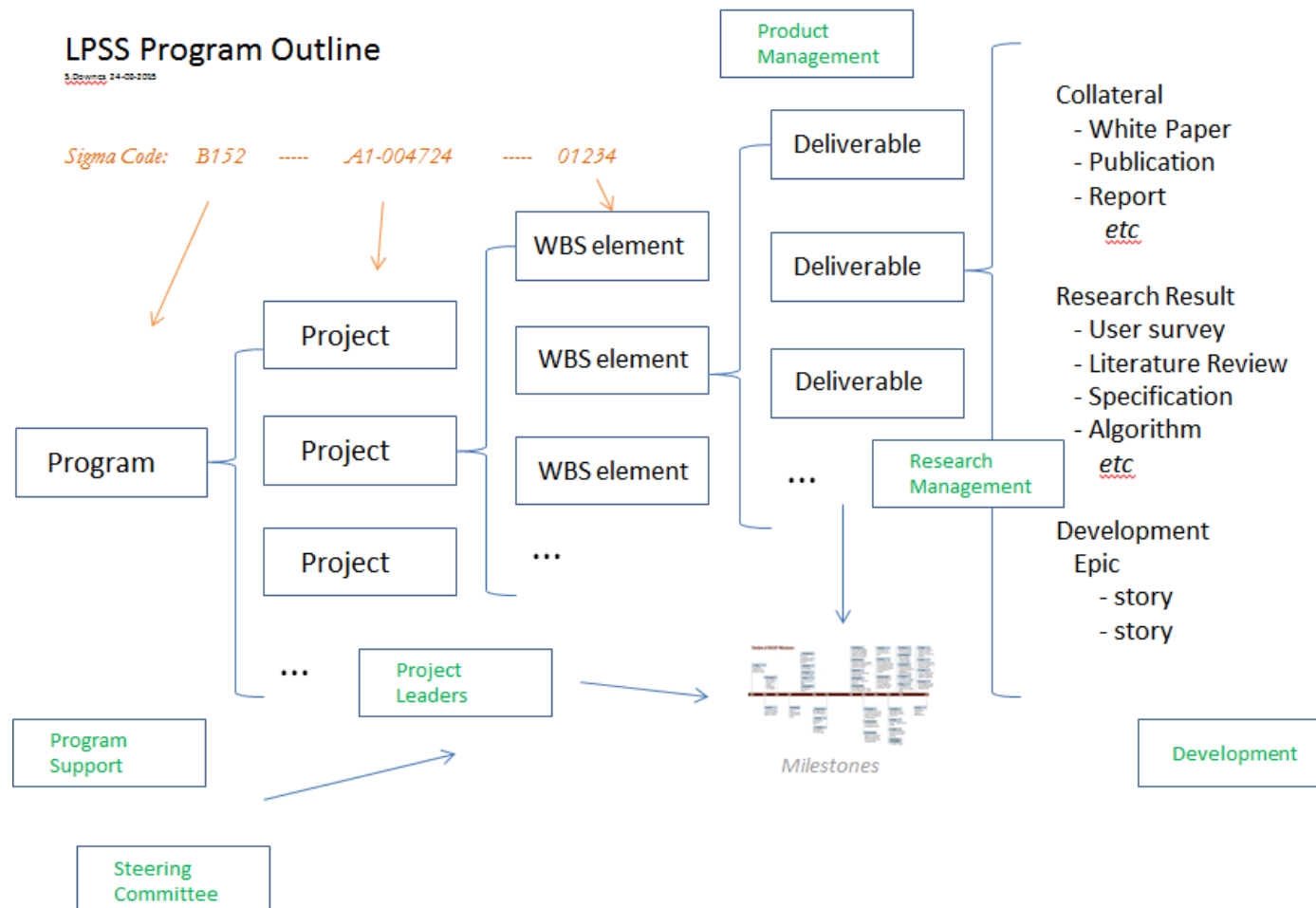
Orange: Implementation projects with commercial clients

Grey: Infrastructure, other NRC programs, external services

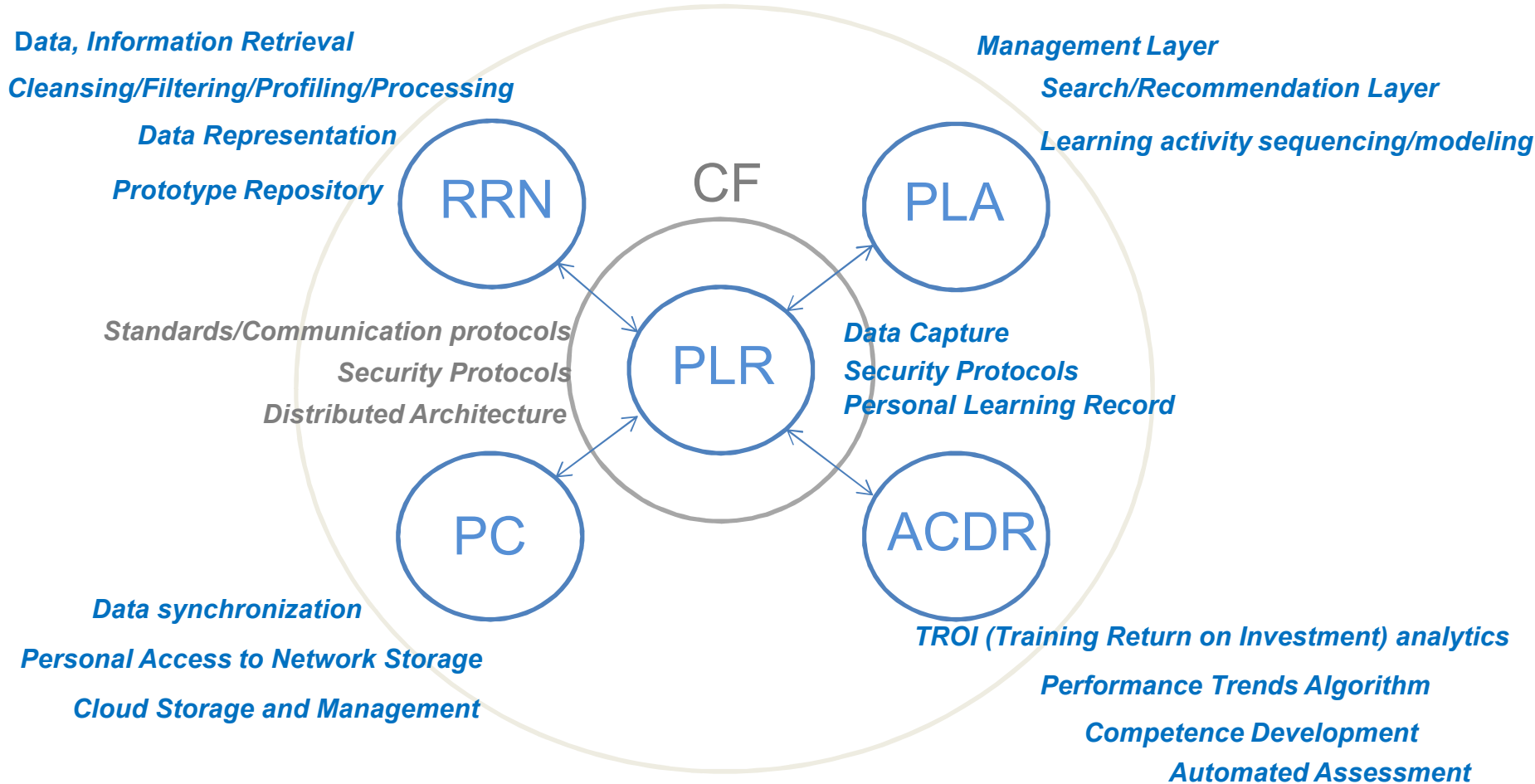
Program Organization



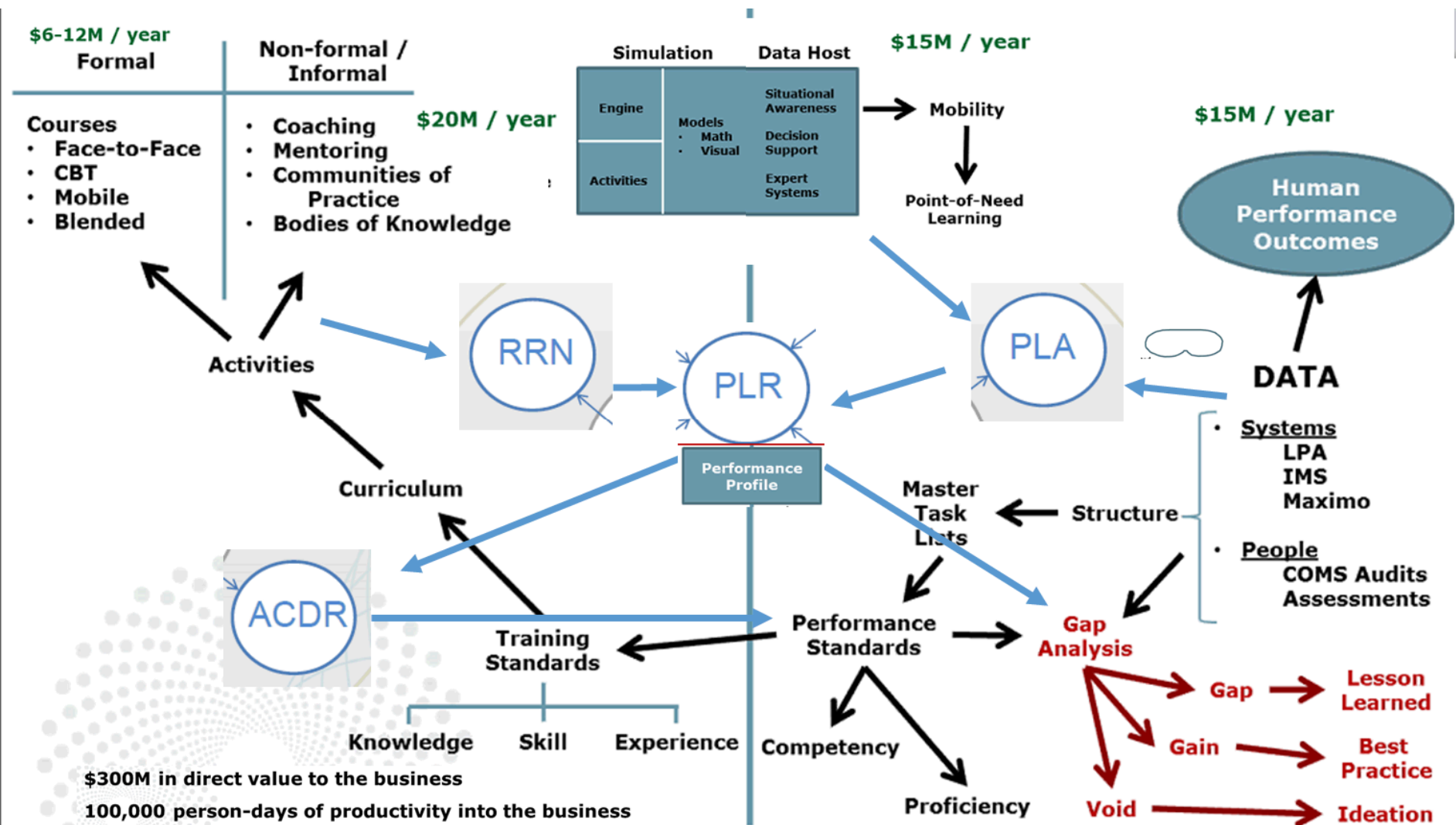
Program Outline



Project Details



LPSS in Context



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

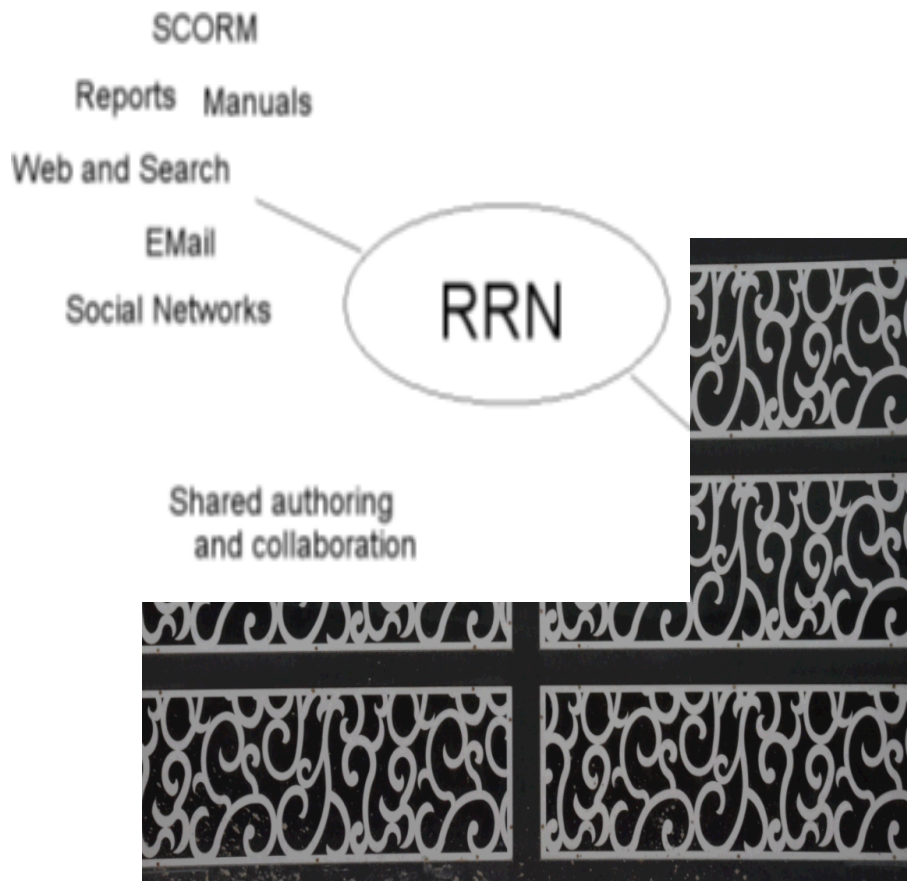
... become that much more difficult

Resource Repository Network



Assemble resources from multiple locations

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

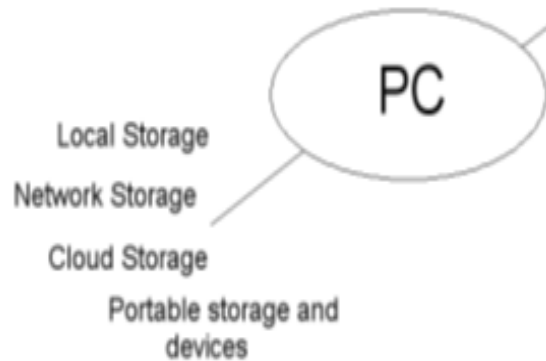
Personal Cloud



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



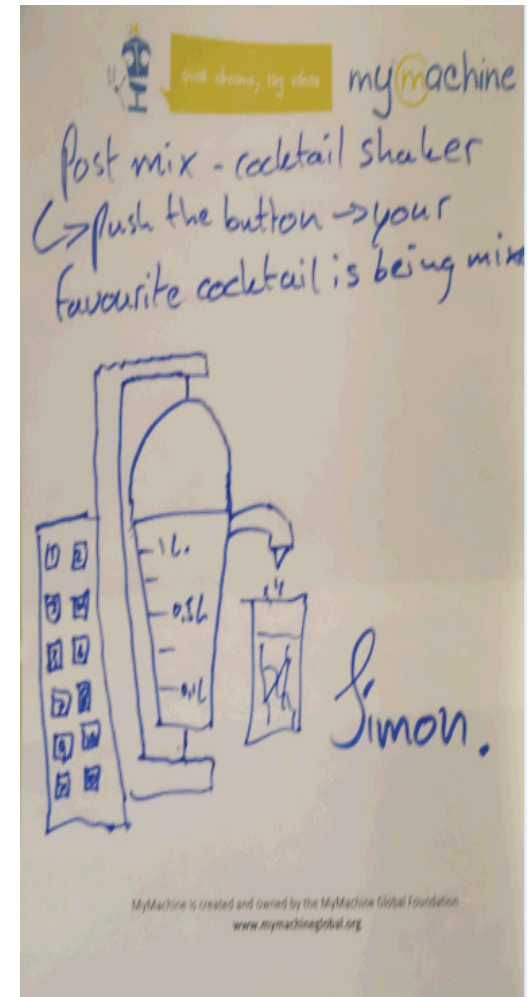
Personal Cloud



- * 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

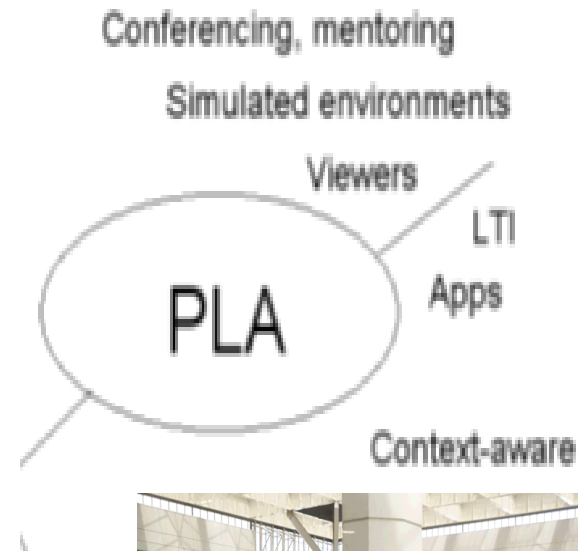
Personal Learning Assistant

Projection of learning services into multiple platforms



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



PLA Simulations Project

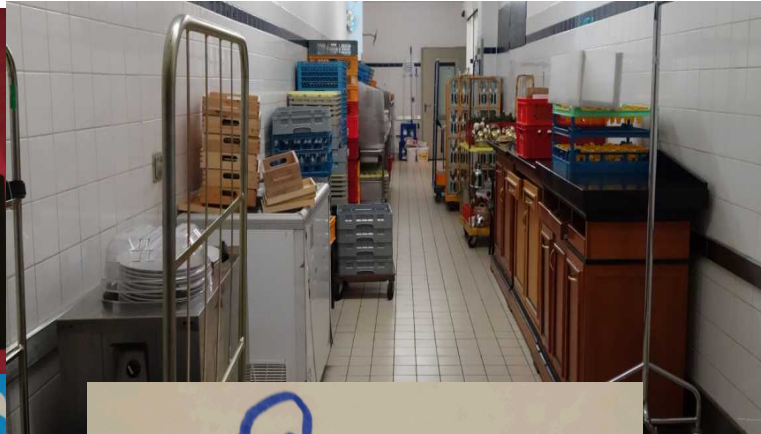


Connecting to real learning and workplace environments

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

Automated Competency Recognition and Development

Analytics as a service – analogy with web translation



Automated 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



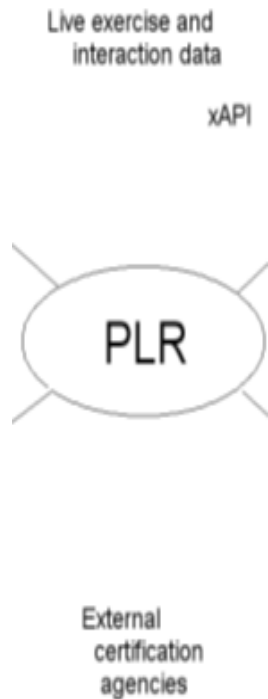
Personal Learning Record

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/>

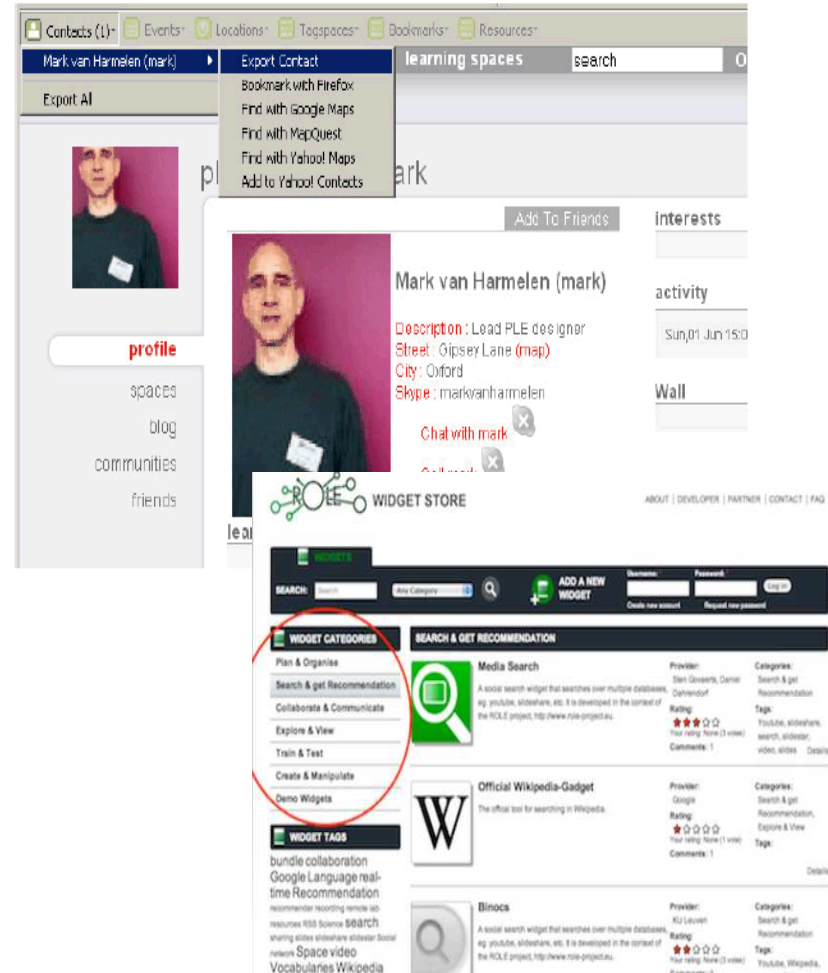
Known <http://withknown.com/>

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

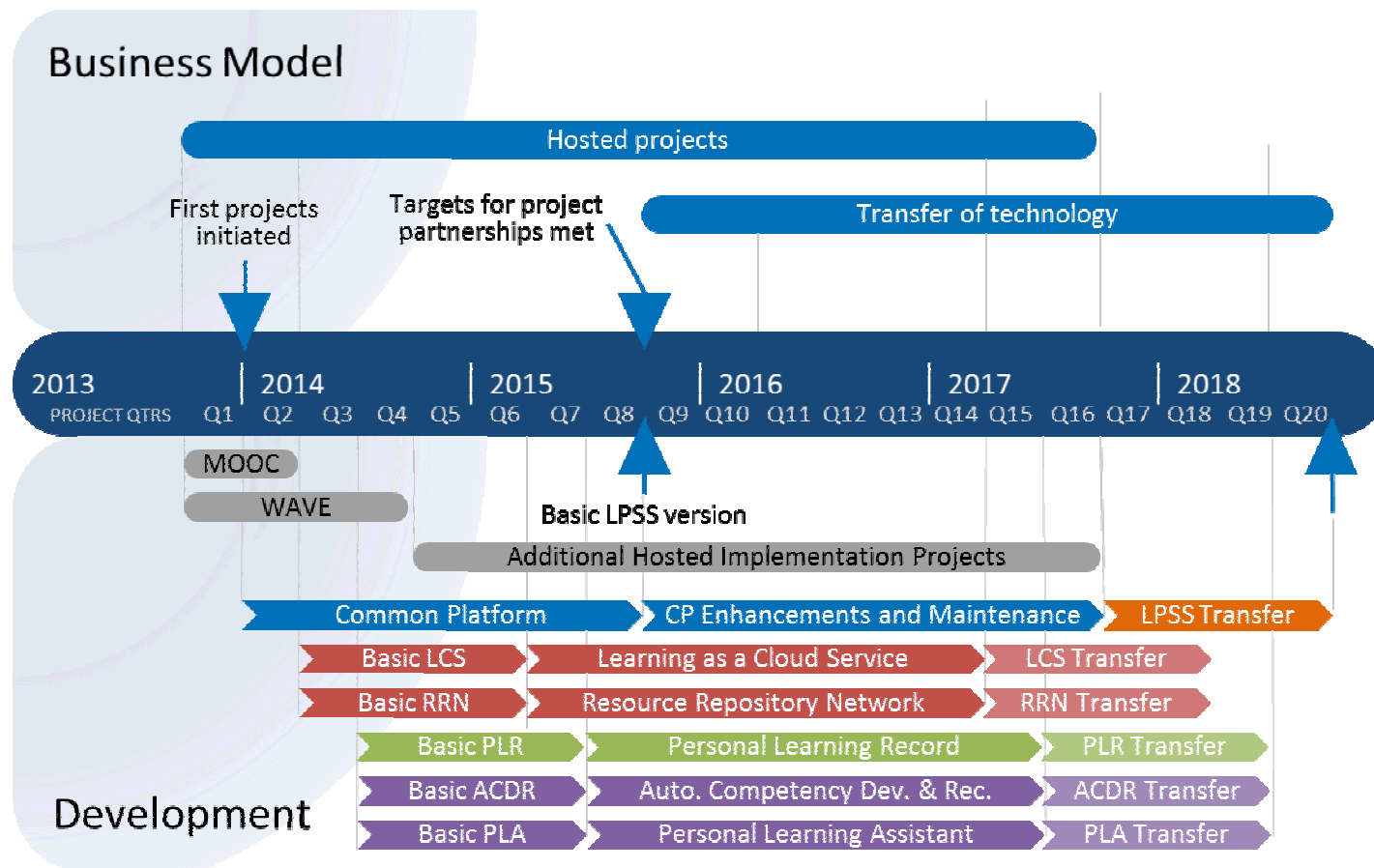
TSILE xAPI

2Sim Simulator xAPI

Workplace T&D



Program Implementation Timeline

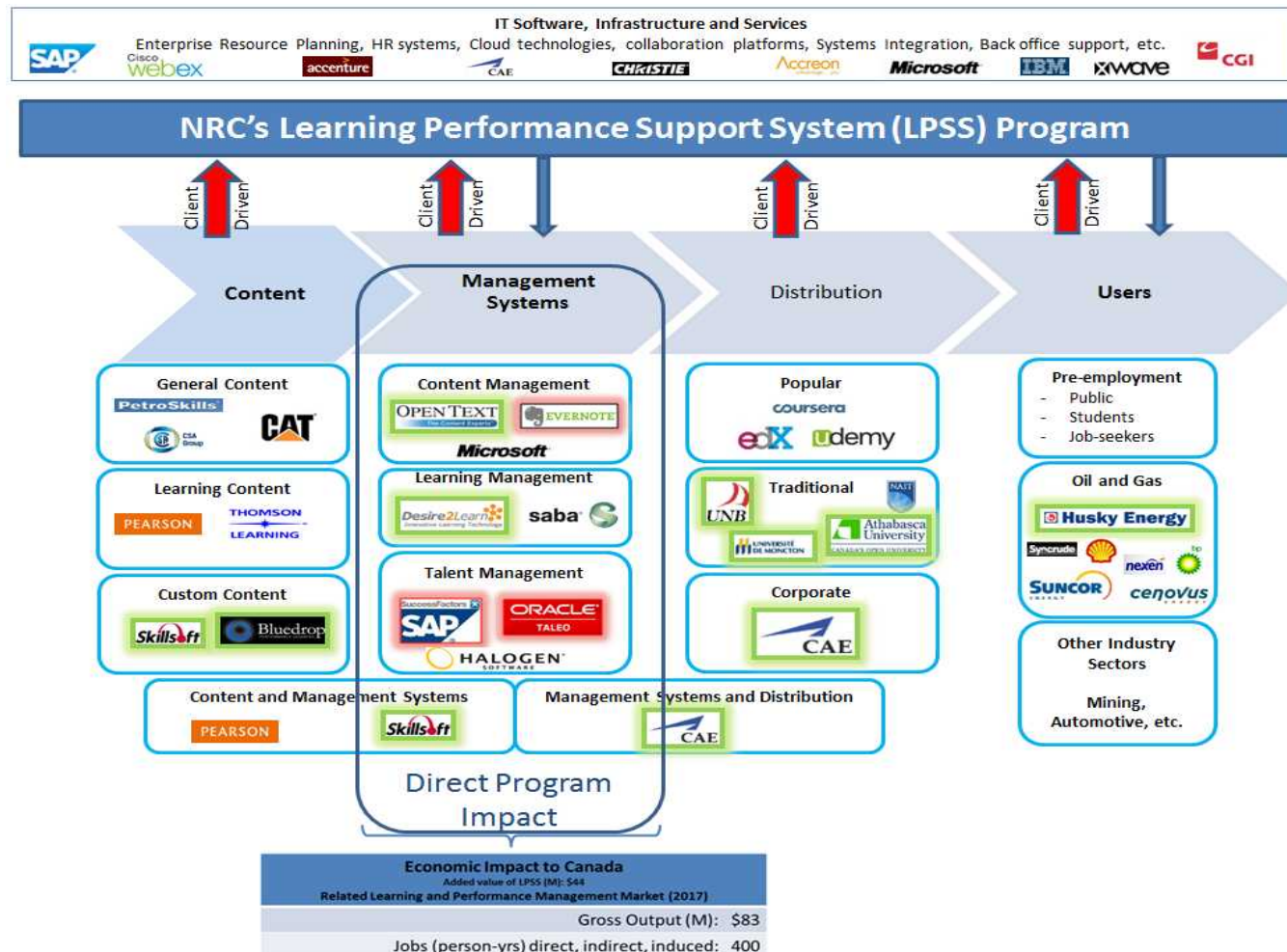


http://lpss.me – prototype PLE

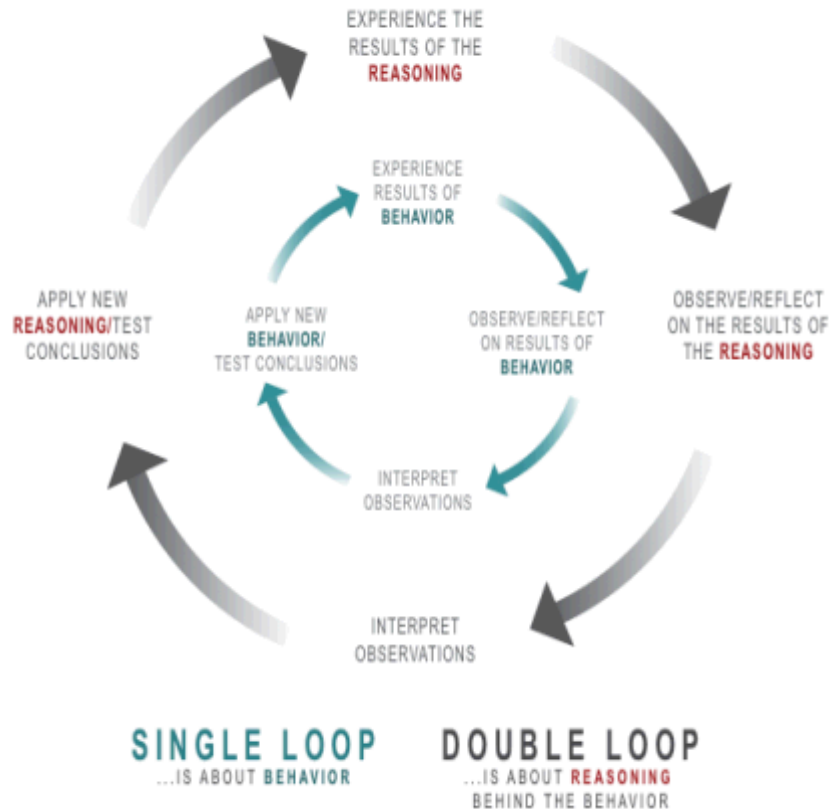
The screenshot shows the LPSS (Learning Personalized System) prototype PLE interface. The top navigation bar includes the LPSS logo, a home icon, and links to Resources, Competencies, Learning record, About, Help, Settings, and Logout. The main heading is "Browse competencies" with a [help] link. Below this is a search bar with the placeholder text "Search for what interests you" and a Search button. To the right of the search bar is a pagination control showing 1, 2, 3, .., 7, >, and >>. Below the search bar are two buttons: "Competency" (green) and "Import" (blue). To the right of these buttons are two checked checkboxes: "Competency hierarchies" and "Competencies", and one unchecked checkbox: "Only my competencies". The main content area displays a grid of competency cards. Each card contains a description, a close button (x), an "Add to my profile" checkbox, and a resource count. The cards are arranged in two rows. The first row contains five cards, and the second row contains four cards. The last card in the second row is partially cut off.

Competency Description	Resources
Acknowledges the practical limits of a system for problem solving [1]	69
Analyze a situation in a systematic manner. [2]	19
Applies different software development methodologies [1]	59
Be familiar with adult learning techniques such as mentoring, coaching, and the sharing of expertise and best practices. [2]	72
Communicate to clients those activities that can and cannot be done. [2]	15
Acts with fairness, courtesy and good faith towards clients, colleagues and others [1]	
Analyze issues to separate the cause from the symptoms. [2]	16
Applies the correct statistical methods to analyze and investigate data [1]	
Build mutual trust by being reliable, consistent and credible. [2]	
Communication [2]	10

LPSS in Canada's Learning Technology Marketplace



Implementation Projects

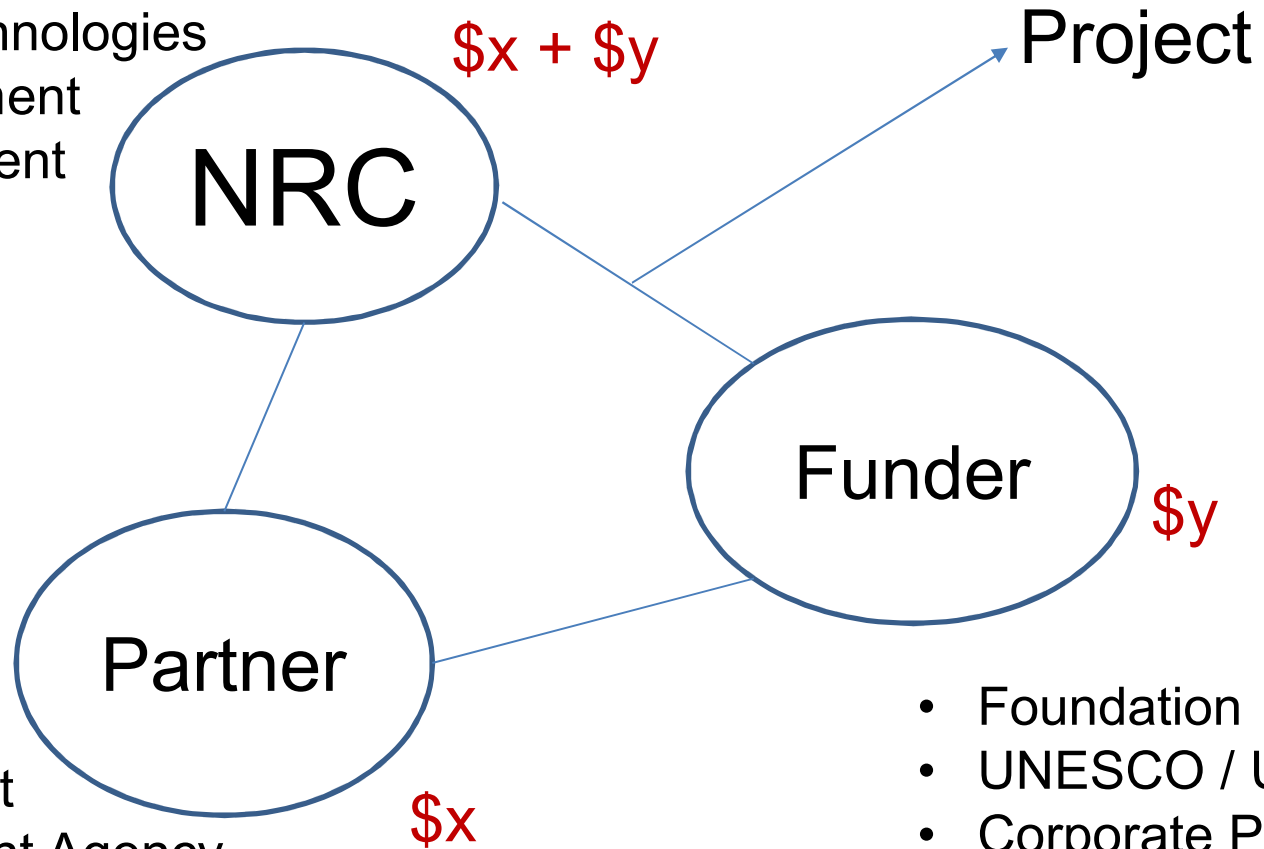


Ultimately, the objective is to support individual learning in a network

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

Expanding LPSS

- \$20 Million Investment
- NRC Technologies
- Development Environment



- University
- Government
- Development Agency

- Foundation
- UNESCO / UN
- Corporate Partner

Possible Projects...

OERs, Repositories, Marketplaces

- eg. OIF MOOC, ALECSO

Badges, Credentials, Recognition

- eg. PCO Badge Project, TSILEE xAPI

Simulations & Workplace Support

- eg. MINT, 2Sim

Matching People to Opportunities

- eg. Concierge, Micromissions



Thank you



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