Education for a Connected World

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Emerging Markets

Welcome to the Human Network
“Technology is changing the way we live, communicate and learn. It also enables educators to re-frame schooling in order to meet the needs of twenty-first century learners.”

Greg Whitby
Trends?
Web 2.0 - Components

Blogs
Wikis
Podcasts
Social Networking
Social Software
Tagging/Folksonomy
RSS

User-Created Content
Power of the Crowd
Filtering the Info Overload
Web as Platform
Anywhere/Anytime
Networking Effects
Hyper-Networking

The Human Network
From Schooling to 21st Century Learning

Provider to User Dynamic

- Connect
- One Service Fits All

User to Provider Dynamic

- Interactive Experience
- Participate
- Interactive Gaming
- Collaborative Services

- Produce
- Create Playlists
- Remix
- Blogs

- Enable
- Complete Customization

Interactive Experience

- Transact
- Network Response

- Participate
- Personalization
- Socialization

- Connect
- Network Response

Interactive Experience

- Produce
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Interactive Experience

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From Schooling to 21st Century Learning
User-Created Content
Mobility
Virtual Worlds
Social Operating Systems
Video in the Classroom
Figure 1. Hype Cycle for Emerging Technologies, 2008

- Cloud Computing
- Social Computing Platforms
- Virtual Public Worlds
- Service-Oriented Network Architecture

Years to mainstream adoption:
- ○ less than 2 years
- □ 2 to 5 years
- ● 5 to 10 years
- △ more than 10 years
- ◦ obsolete before plateau

Source: Gartner (July 2008)
Challenges
The Flattening World
Global Competitiveness
Sustainability
Doing More with Current Budgets
Technology Challenge (1)
Digital Divide / Digital Exclusion
Technology Challenge (2)
Keeping Pace with the Rate of Technological Development
Shifting Nature of Education
Changing Definition of the School
21st Century Teaching
A Challenge….and a problem?
The Best Education Systems...
...have the Best Teachers!
Transformational Themes

How do we bring about sustained change in Education?
Learner-Centric Education

The Learner is the Focus
Leadership & Vision

Purposeful Change
21st Century Teacher
Empowering the Teacher
Public-Private Partnership

Working Together for Genuine Transformation
Imagine a School….

….for the 21st Century
Imagine a school…

…that addresses every student’s individual learning style, with highly engaging online curriculum to thoroughly involve, challenge, and inspire them.
Imagine a school...

...where the learning process is invigorated by personalized feedback, proficiency reporting, and other innovative student performance data.
Imagine a school...

...that connects classes and experts from around the world; providing a Spanish class with a teacher in Madrid, and enabling a science class to experience an Arctic expedition in progress.
Imagine a school...

...that automatically communicates with all parents every day about homework assignments, attendance, and important school events.
Imagine a school...

...where bells, alarms, heating, lighting, and other building systems can be controlled and monitored from any location.
Imagine a school...

...that gives teachers effective productivity tools, to ensure that their administrative tasks don’t take away from their classroom time.
Imagine a school...

...where wireless devices free teachers from the blackboard, enabling them to interact with every student in the entire class, to improve learning and class management.
Imagine a school...

...where every student carries a PDA or a laptop instead of a backpack; where entry to buildings is granted through a student ID card; where students have continuous access to equipment, online curriculum, schedules, library check out, messages, and entertainment, at any time, from any location.
Imagine a school…

…that provides teachers and staff with the information they need about students, scheduling, and administrative matters, around the clock, from anywhere—at home, on a field trip, or even from the soccer field.
“The best way to predict the future is to invent it.”

Alan Kay
SSDN Principles

- To serve teaching and learning primarily
- Universal access - every teacher and every student
- Fully accessible
- Platform independent
- Open standards - extensible
- Safe and secure
- Single log on to all applications
- Web-delivered / browser-based
Scottish Schools Digital Network

Key Components
Broadband Network
Cisco Expo 2009

Content Delivery

John Connell
Cisco Expo 2009

Learning Platform

Broadband Network

Content Delivery
5 cities = 5 Points of Presence
32 Local Authorities Connected
Cisco Expo 2009

Cisco Content Engines → Main National Data Center

36 Regional Data Centers

3000 Schools

Content Delivery
What does CDN do?

- National Web Cache
- Local/National Content Channels
- Push-Pull for Resources
- Access to Rich Media
- Streaming of Video & Audio
- Pre-Positioning of Resources

CDN
4 Integrated Web-Based Elements
4 Integrated Web-Based Elements

Learning Platform

Authentication
Identity
Management
User Directory

Cisco Expo 2009
4 Integrated Web-Based Elements

- Learning Platform
- Virtual Learning Environment
- User Directory
- Management
- Identity
- Authentication
4 Integrated Web-Based Elements

- Collaborative Environment
- Authentication
- Identity
- Management
- User Directory
- Virtual Learning Environment
Every user has unique user-name and password

Every user’s ‘role’ is known

Scotland will have a fully national authenticated education community
Every adult able to make direct contact with every other adult on the system

National contact lists enabled

‘Presence’ aware
Learning Platform

Course & lesson-building tools

Assessment tools

Pupil tracking capabilities

Every user has personal ‘space’
(as has every institution / organisation)

Retrieval of content

Publishing / presentation tools

National Virtual Learning Environment
- Services dependent on needs, e.g. MIS / Facilities Management / Project Management / Pupil Tracking / Productivity Suites / Legacy Systems

- Separation of Curriculum & Content
- Quality assured content
- Non-officially sanctioned content
- User-generated content
- Private/Commercial suppliers

- Course and lesson creation
- Assessment tools
- MIS & pupil tracking
- Access to content
- Publishing tools

- Desktop video / audio conferencing
- Newsgroups
- Chat room capabilities
- Email
- Mailing lists
- Threaded discussions
- Virtual whiteboard capabilities
- Application sharing

- Blogging tools
- Wikis
- Podcasts
- File sharing

- Security and safety;
- Interest Groups
- Online Communities
SSDN / Glow Architecture

Intranet Access
- Connectivity
- Remote access
- Firewalls
- Load Balancing

Internet Access
- Caching
- Content Filtering

Portal
- Presentation
- Navigation
- Personalisation
- Aggregation
- Application Framework

Portal Services
- Directory
- Authentication
- Authorisation
- Identities

Web Authoring & Hosting
- Home Pages
- Web Building
- Publishing

Communications
- Email
- Instant Messaging
- Chat Rooms

Collaboration
- Mailing Lists
- Net Conferencing
- VoIP
- Whiteboards

Collaboration
- Video Conferencing
- Integration

Collaboration
- Secure File Transfer

Learner Environment
- Curriculum Management
- Delivery
- Assessment

Content Delivery Integration
- Video On Demand
- Video Distribution

School Admin Integration
- Attendance
- Timetabling
- Pupil Data

External Content Integration
- External Sites & Content Providers

Management and Operational Reporting

Integration
- Messaging
- Process Modelling
- Orchestration
- Storing
- Routing
- Transformation

Data Storage
- System Data
- Application Data
- Content
- Transactions
- Reporting
- Mining
- OLAP
Cisco Expo 2009

Generic Learning Platform Architecture

- Internet Access
  - Core Portal Product
  - Authentication, ID Management, Federation - wrap-around Applications
  - Email Service
  - Web Conferencing
  - Mailing Lists
  - VLE / MLE
  - Collaborative Tools
  - CDN / WAAS
  - Admin Systems
  - Secure File Transfer
  - Web 2.0 Apps

- Filtering / Caching
  - Monitoring / Alert System
  - Application Integration
  - SQL Server Database
  - Server Architecture
  - Data Storage & Backup (SAN)
  - Core Network

- Patch Management / Configuration Management
Main Data Center & Fallover DC
Consolidated Architecture

End-to-End

- Universities and Colleges
- Students, Teachers and Administrators at School
- State Schools
- Private Schools
- Secure Remote Access Service
- Students, Parents and Teachers at Home
- Cable
- DSL
- Dial
- Internet/ISP
- Resilient Gateway to Universities/Colleges
- Ministry of Education and other admin agencies for Education
- National Schools Primary/Secondary Data Centres (hosted services for Education and Administration)
- Filtered Internet Gateway for all connected sites centrally managed as part of the National Data Centre - Might be centrally managed but deployed regionally
- Content providers - including Government Agencies, commercial providers etc
Collaboration
eLearning
Virtual Learning
Web 2.0
Mobile Learning
Anywhere/Anytime Learning
Integrated Education Management
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