Emerging Trends in Technology Applied to Academia and Education

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Opening learning and access

The need for continuous and LLL

Globalisation and mobility

Competing for studens and funds

Integration with businesses

ICT and other technologies

Drivers and trends

- **Mobile technology and devices**
- **LMS, course authoring and management systems**
- **Digital content repositories and services**
- **Social software**
- **Semantic and language technologies**

- **Cloud computing**
- **Augmented reality**
- **Artificial Intelligence (from analytics to companions)**
- **Smart environments and sensor networks (IoT, FI)**

- **3D printing**
- **Intelligent/cognitive devices and embeeded systems**
- **Nanotechnology**

Technology trends
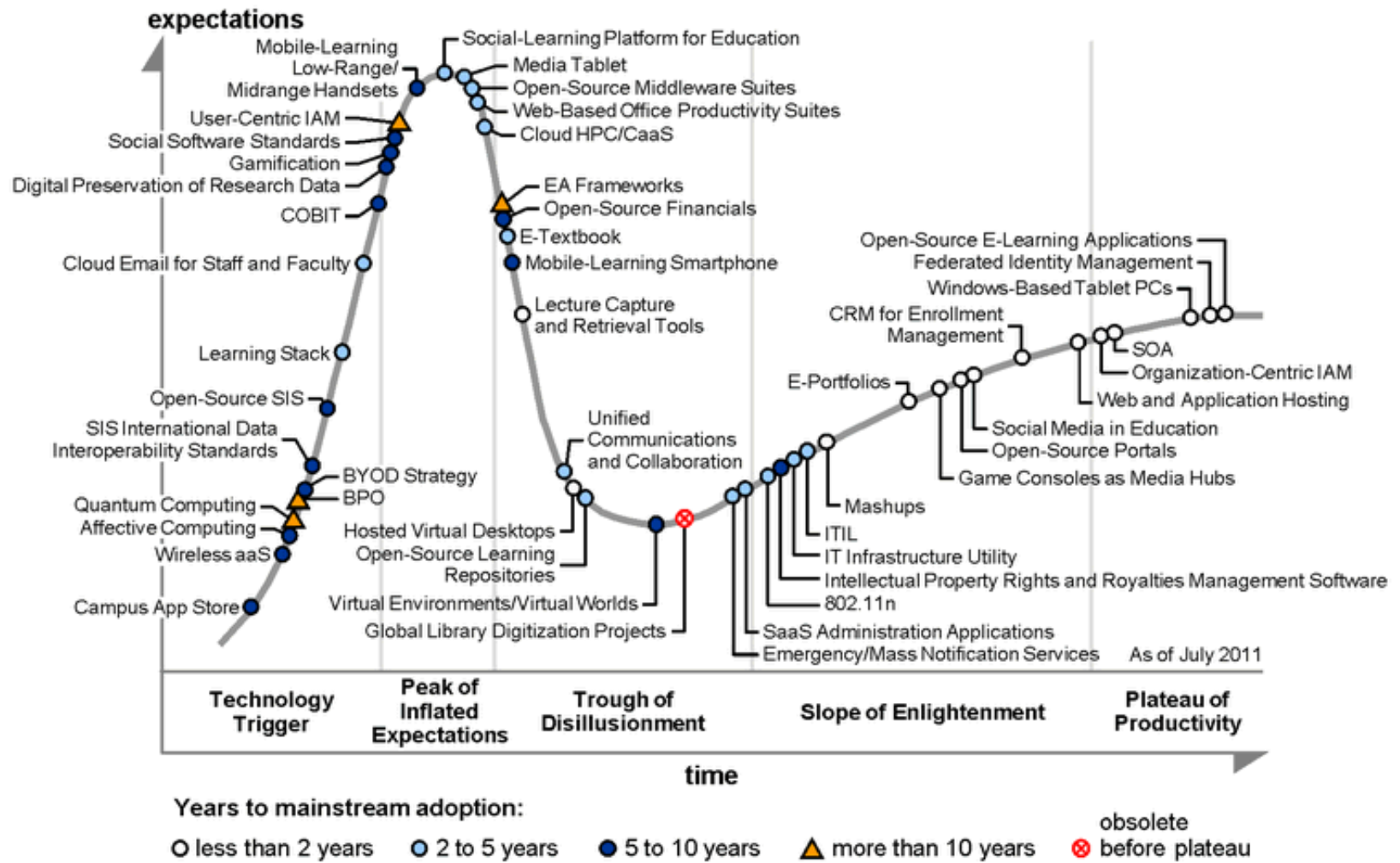
Technology is there I
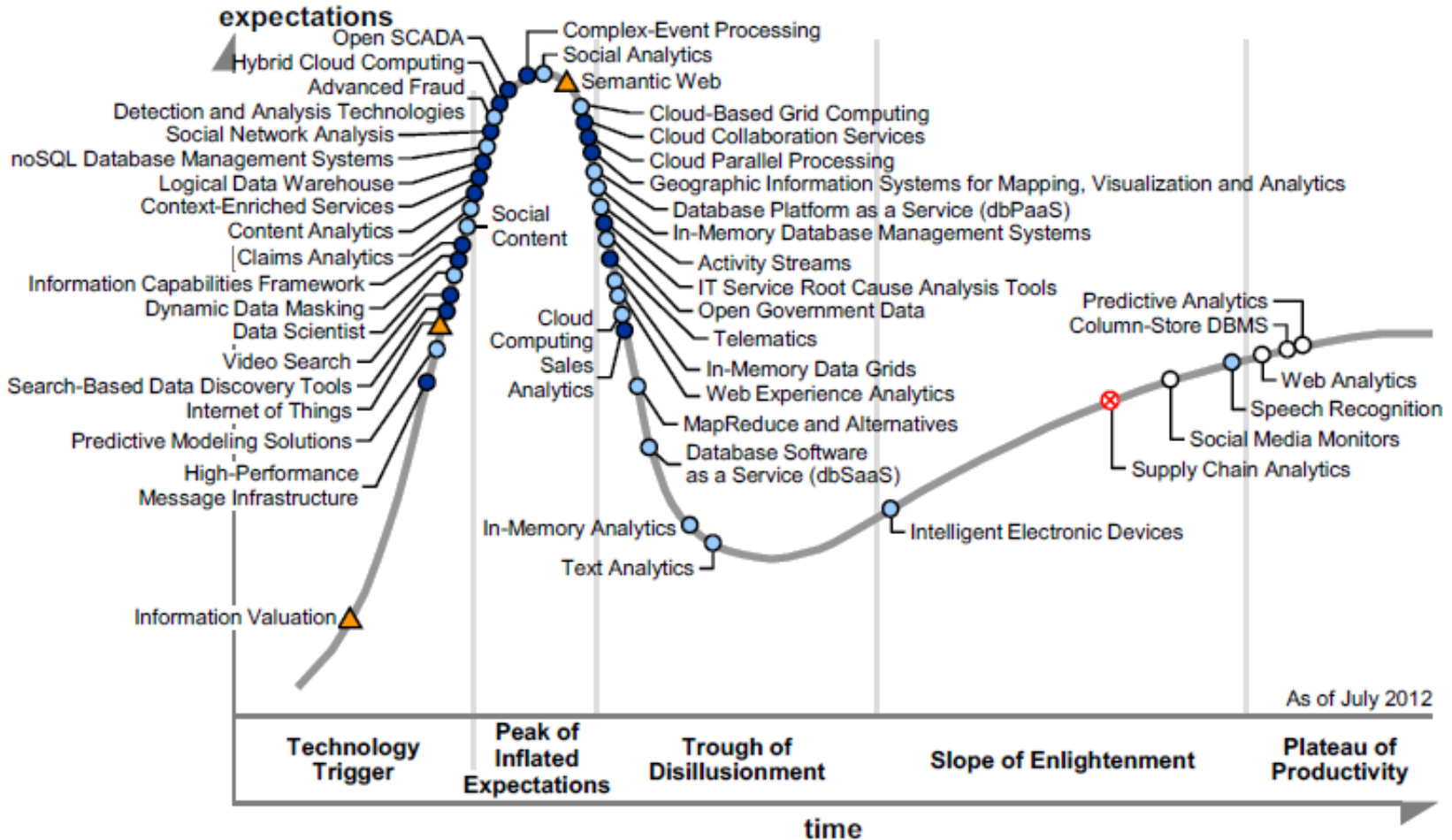
Hype Cycle for Big Data, 2012 (Source: Gartner, July 2012)

Technology is there II

- „691,000 students in the US, with an annual value estimated at around $20bn". (BBC News)

- „340,000 students taking UK university courses in their home countries". (Irish Times)

- „Indian public opinion was outraged after a series of attacks on Indian students in Australia in 2009. Applications from Indian students slumped by 50% - and threatened an industry which had grown to become Australia's third biggest export". (Australian Technology Network)
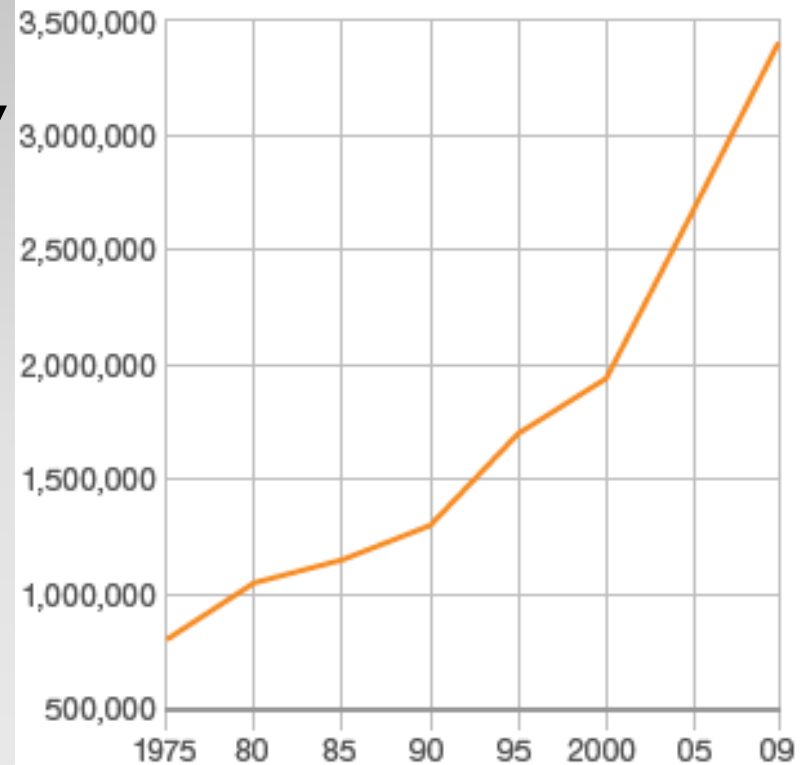
Increasing market

- „The number of students around the globe enrolled in higher education is forecast to more than double to 262 million by 2025". (University World News)

- „The number of students seeking study abroad from China and India alone could rise to 8 million – nearly three times more than today." (University World News)

- „The total number of universities in the world are counted to 17036". (According to International Journal of Scientometrics, infometrics and bibliometrics)

Increasing market

- **The countries which play host to the most international students in absolute terms are:**
  - **United States (18%),**
  - **United Kingdom (10%),**
  - **Australia (7%),**
  - **Germany (7%),**
  - **France (7%).**
  - **Canada (5%),**
  - **Japan (4%),**
  - **Russia (4%), and**
  - **Spain (2%)**

International student numbers

3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000

1975 80 85 90 95 2000 05 09

Source: Unesco

Increasing market

Peers (Chronicle)

University hotspots – geographical distribution of highest impact institutions, 2009

Location of top-50 universities by main subject areas

Source: OECD and SCImago Research Group (CSIC) (forthcoming), *Report on Scientific Production*, based on Scopus Custom Data, Elsevier, June 2011.
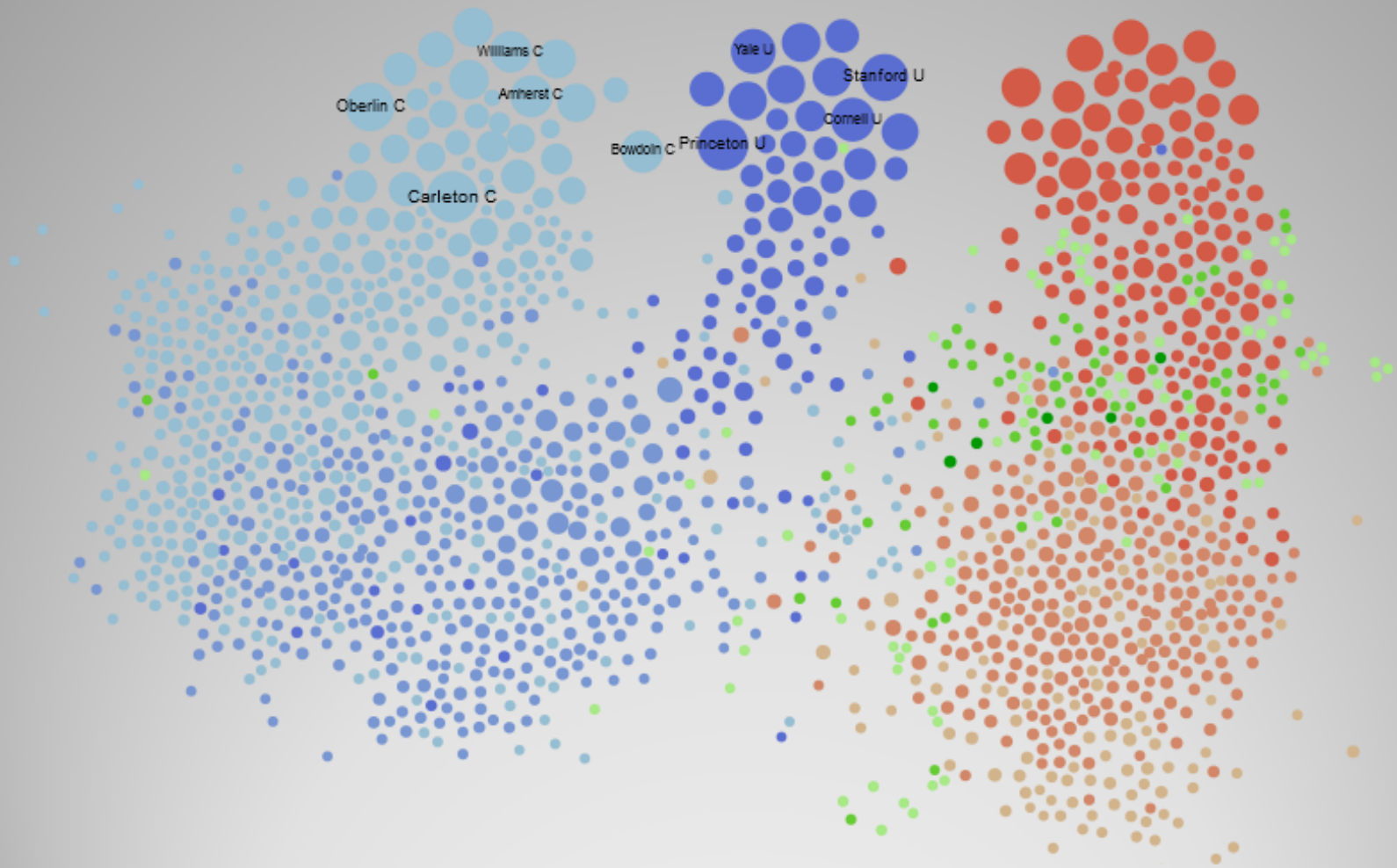
Sector Breakdown - Large Organizations

- Education — 17%
- Technology — 12%
- undefined — 10%
- Financials — 9%
- Information Technology — 8%
- Industrials — 7%
- Services — 7%
- Basic Materials — 4%
- Consumer Discretionary — 4%
- Healthcare — 3%
- Consumer Goods — 3%
- Materials — 3%
- Industrial Goods — 3%
- Energy — 2%
- Utilities — 2%
- Health Care — 2%
- Consumer Staples — 2%
- Telecommunication Services — 1%
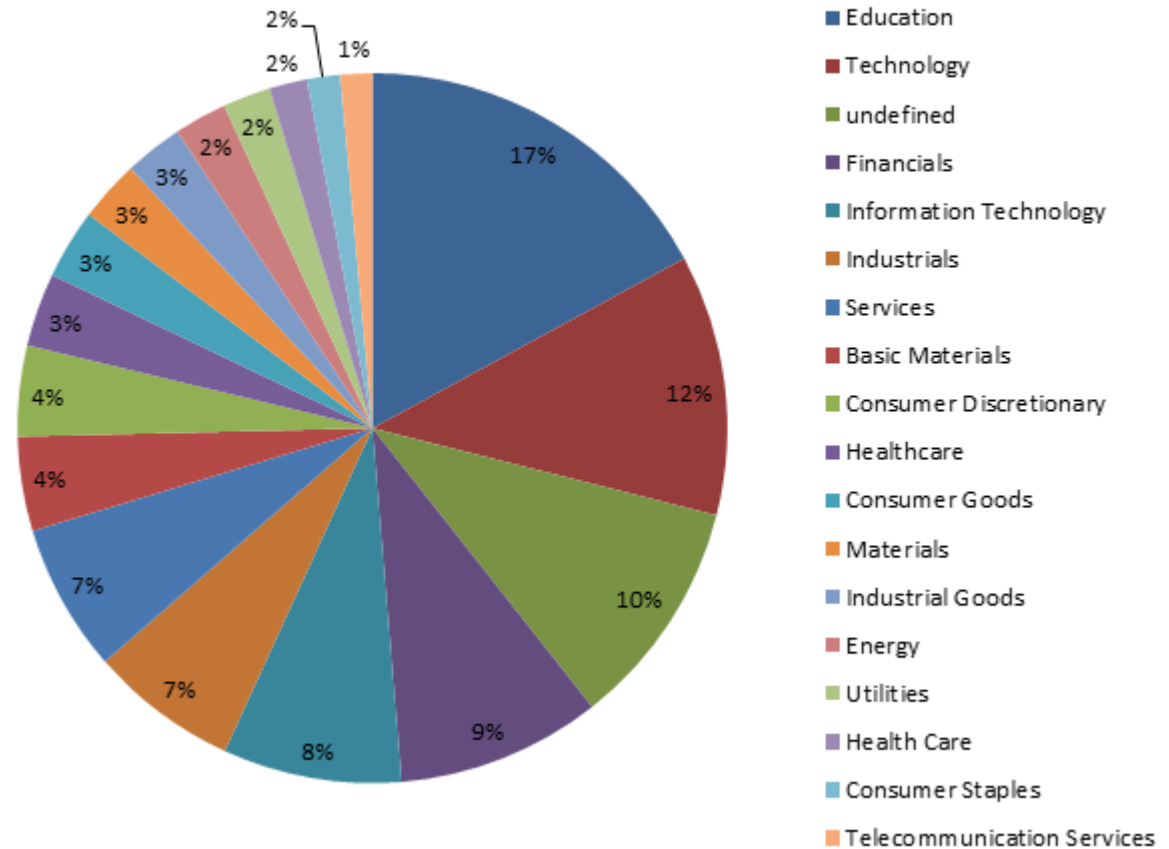
UCaaS (by Unified Communication Strategies)

Big players understand the market potential

Sector Breakdown - La[...]
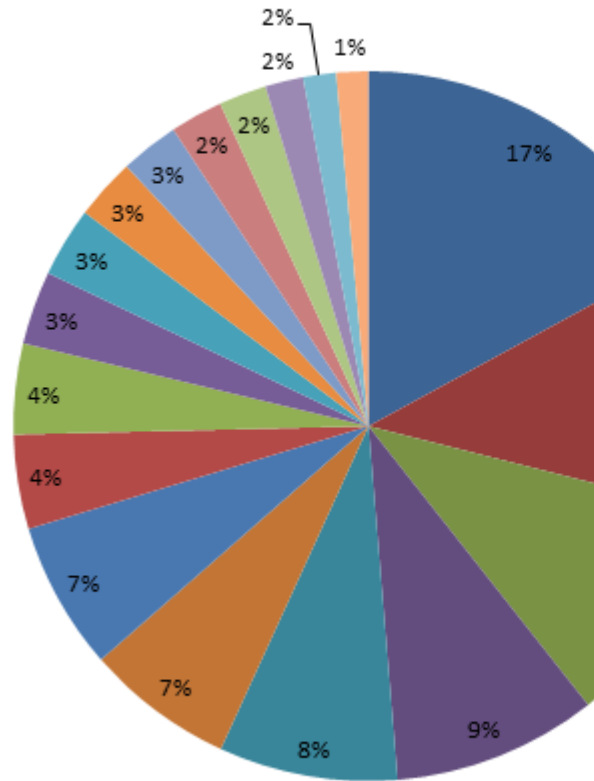
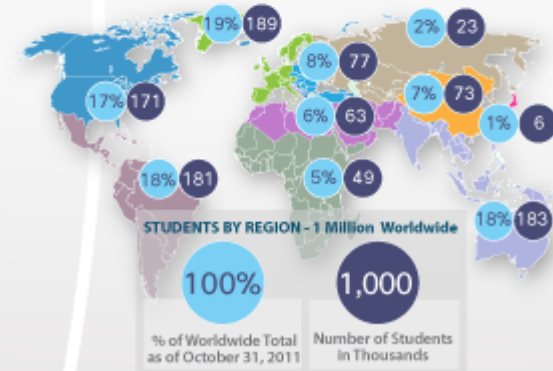UCaaS (by Unified Communicatio[...]

4+ Million
students since inception

300,000
Facebook fans, growing daily

110 Million
online assessments since inception
with 1 million monthly assessments
Statistics as of January 2012

10,000 Academies
165 Countries

STUDENTS BY REGION - 1 Million Worldwide

100%
% of Worldwide Total
as of October 31, 2011

1,000
Number of Students
in Thousands

Big players understand the market potential

Figure 3: Which Universities Use Enablers?

Company	# of Partners	Non-Profit
Embanet+Compass	35	BOSTON UNIVERSITY
Deltak	26	PURDUE UNIVERSITY
ACADEMIC PARTNERSHIPS	14	FIU FLORIDA INTERNATIONAL UNIVERSITY
Bisk bisk education	12	UNIVERSITY OF NOTRE DAME
PEARSON	10	ASU ARIZONA STATE UNIVERSITY
Educators Serving Educators	7	AMERICAN INTERNATIONAL COLLEGE
LEARNINGHOUSE Your Online Education Partner	5	Albany State University POTENTIAL. REALIZED.
COLLOQUY	4	GEORGE MASON UNIVERSITY
2tor	4	USC University of Southern California
AltiusEd	1	TIFFIN UNIVERSITY

own - La...

4+ Million
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Statistics as of January 2012

10,000 Academies
165 Countries

19% 189 2% 23
8% 77
17% 171 7% 73
6% 63 1% 6
18% 181 5% 49
18% 183

STUDENTS BY REGION - 1 Million Worldwide

100%
% of Worldwide Total
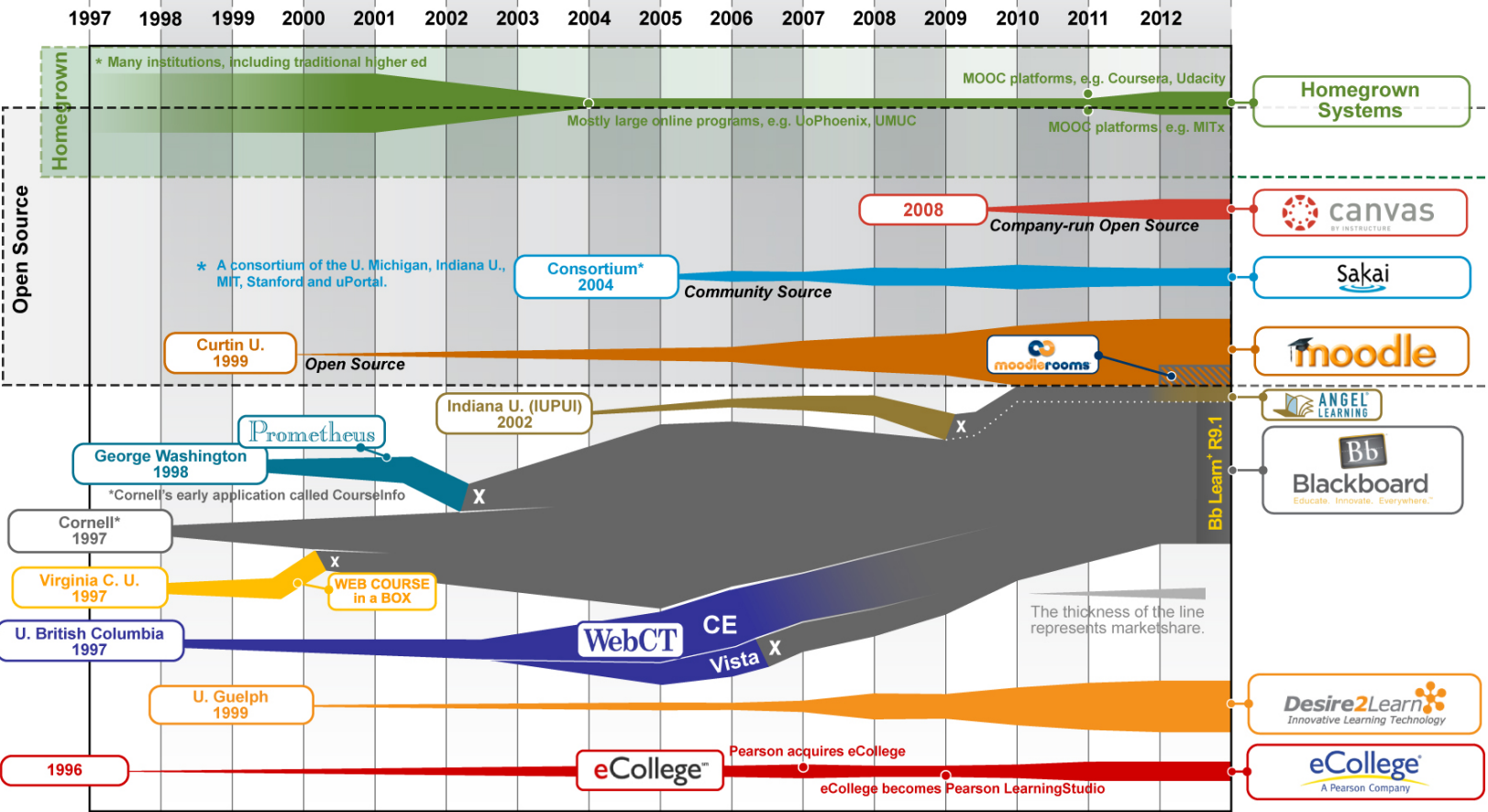as of October 31, 2011

1,000
Number of Students
in Thousands

17%

9%

municatio...

Big players understand the market potential

Figure 3: LMS Market Share for All Institutions

Big players understand the market potential

Large scale reasoning   Cognitive systems

Interoperability models and solutions

Self-awareness

Language technologies   Semantic and Context technologies

Machine learning

Information retrieval   Multimodal interfaces
Knowledge discovery

Ubiquitous sensing

Data collection and storage

Internet of things (everything)

What is out there?

Mass data

Multimodal data

Some meta-information

What is out there?

Is it accurate?

Where to look?

How to select and filter?

How to cope with all the news?

What to do with it?

How to file and categorize it?

How do I find the right information?

Is it accurate?

Where to look?

How to select

Never have so many people written so much to be read by so few...”
- Katie Hafner

it?

How to file and categorize it?

How do I find the right information?

- **Learning**
  - Technology driven
  - Self-learning
  - Open access

- **Teaching**
  - Does not work only with ICT
  - instructors engage in dialogue, develop critical thinking skills and spark passion about a discipline.

Returning back to teaching – „blended approach"

- **The generations that are comming are different – ICT, videos, interactive games are embeeded in their mental models**

- **Serendipity: rapid development of new technologies**

- **Mass content, information**

- **Networking as a fundamental mechanism**

- **Learning machines**

- **It is not about competition it is about collaboration**

We are ignoring...

social

open

personal

mobile

augmented

visual

The future of learning is…

social

open

Collaborative

Open

personal

Distributed

mobile

augmented

Digital

visual

The future of Academia is...

Customers	Domestic students		International students		Industry	
Product offerings	Vocational and further education and training		Higher education		Research	
Education disciplines	Arts	Engineering	Science	Business	Medicine/health	Law
	IT	Design	Other	Other	Other	Other
Sales	Schools	Open days	Agents	Road-shows	Digital	Other / Other
Delivery	On campus				Digital	Partnerships
Student services	Student administration		Career centre		Other	Other / Other
Back office	HR	IT	Finance	Legal	Other	Other / Other

Source: Ernst & Young

„Status Quo"

Customers	Domestic students		International students		Industry professionals		Other education providers
	School leavers	Mature age	High-end	Mass market	B2B	Executive education	
	Parents		Content wholesalers		Content consumers		Service providers

Product offerings	Vocational and further education and training	Higher education	Research	Mass distribution
	Content aggregation	Entertainment	Financial services	Other

Sales	Other	Digital	Other	Other

Delivery	Digital	Partnerships	Other	Other

Student services	Student administration, career services, other (outsourced)
	Customer relationship management (cloud)

Back office	Outsourced

Source: Ernst & Young

„Transformers"

- **The war of titans (network and globalisation)**
  - ◦ **What is there for small nations, 3rd world countries?**
- **New systems – old paradigms**
- **Loosing quality by inflated programs**
  - ◦ **Academia is not an industry**
- **Polarisation:**
  - ◦ **"Louis Vuitton on Fifth Avenue" tyep of universities at one side**
  - ◦ **"Wal Mart" type universities at the other**
  - ◦ **... and nothing in between**
- **Cross-accreditation is still a political incentive**
  - ◦ **Bologna refform in Europe**

Implications for Academia

- "Other institutions will look at edX certificates – which, after all, are based on courses developed by Harvard, MIT and Berkeley – and say they might accept them as credit towards a course of study." (Listener)

- The ideal behind MOOCs courses is "the promise of scaling a university education to everyone... well everyone with an Internet connection, that is." (Hack Education)

- **Open access, open knowledge, open education**
  - ◦ **Videolectures.net**
- **SCI video scientific journal**
  - ◦ **2 scientific journal in operation**
- **Virtual scientific conferences**
- **Virtual Universities**

- **Web 2.5 for learning**
- **Innovation tube – entering businesses**

K4A foundation