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MOOC (Massively Online Open Courses)

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1. INTRODUCTION



IEEE CS 2022 report
In 2013-14, nine technical leaders wrote a report, entitled IEEE CS 2022, surveying 23 innovative technologies that could change the industry by the year 2022.

1. INTRODUCTION: 23 Technologies in 2022

– The report covers

1. security cross-cutting issues,
2. open intellectual property movement,
3. sustainability,
4. massively online open courses,
5. quantum computing,
6. device and nanotechnology,
7. 3D integrated circuits,
8. multicore,
9. photonics,
10. universal memory,
11. networking and interconnectivity,
12. software-defined networks,
13. high-performance computing,
14. cloud computing,
15. the Internet of Things,
16. natural user interfaces,
17. 3D printing,
18. big data and analytics,
19. machine learning and intelligent systems,
20. computer vision and pattern recognition,
21. life sciences,
22. computational biology and bioinformatics, and
23. robotics for medical care.

- These technologies, tied into a scenario that we call seamless intelligence, present a view of the future. For each of the 23 technologies, there is a description of the state of the art, challenges, where we think the technology will go, and its disruption

1. INTRODUCTION: Technologies Landscape

Market Category	Life Sciences (21)	Computational Biology and Bioinformatics (22)	Medical Robotics (23)
Technologies	Computer Vision and Pattern Recognition (20) Machine Learning and Intelligent Systems (19) Big Data and Analytics (18) Natural User Interfaces (16)	3D Printing (17)	High-Performance Computing (13) Cloud Computing (14) Internet of Things (15) Networking & Interconnectivity (11) Software-Defined Networks (12) Quantum Computing (5) Device and Nanotechnology (6)
Human Capital	Massively Online Open Courses (MOOC) (4)		
Policies	Open Intellectual Property Movement (2) Security Cross-Cutting Issues (1)	Sustainability (3)	

Landscape of 23 technologies. (The numbers after the technology represent the subsection in Section 3. In the report)

1. INTRODUCTION

What is a MOOC?

- It stands for Massive Open Online Course
- MOOC is a model for delivering learning content online to any person who wants to take a course, with no limit to attendance.
- It is a course aimed at unlimited participation and open access through the internet
- MOOC's are typically provided by higher education institution often in partnership with organizers such as Udacity, though some MOOC's are being offered directly by a university.

1. INTRODUCTION

MOOC

➤ M- Massive

- connectivity through the use of internet with different people.

➤ O- Open

- learners or students interact with others freely

➤ O- Online

- course is taken with others completely online

➤ C- Course

- a MOOC deals with different topics but only covers one

1. INTRODUCTION

Why use MOOC'S

ORIENT

- worldwide
- communication

DECLARE

- Network
- Cluster

FOCUS

- learn
- interact

1. INTRODUCTION

Continues...

- Helps learners to exchange knowledge
- Offers plenty of opportunities to share ideas
- Increases options for accessibility
- Increases potential of student engagement
- Lifelong opportunities are being expanded

1. INTRODUCTION

History of MOOC(its origin)

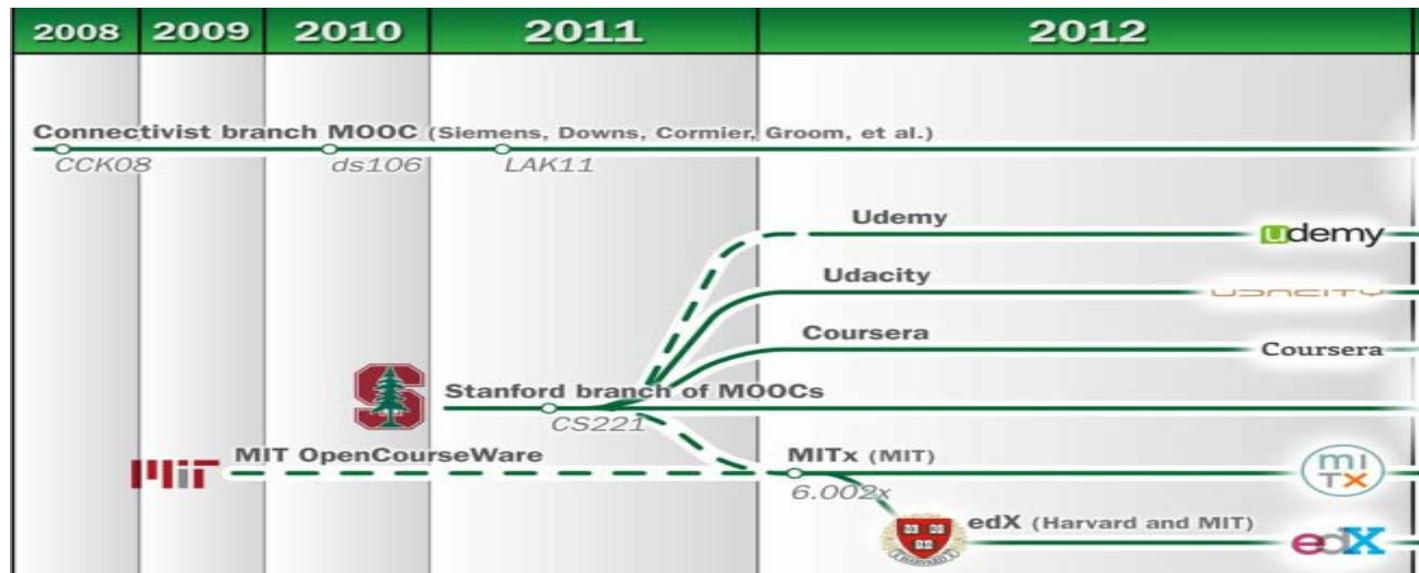
- **Originated** as open online course's(OOC's) using web technologies to present an open education experience online
- **2008**: 2,200 people signed up for Siemens and Downes' Connectivism and Connective Knowledge course and it was the first MOOC presented at the University of Manitoba
- **2011**: the University of Illinois' not-for-credit course had 2,700 participants
- **In May 2012**, Harvard and MIT launched the non-profit, edX, with the University of California at Berkeley joining soon after.
- **Also in 2012**, the for-profit company Coursera was founded by Stanford professors Koller and Ng (Carr, 2012).

1. INTRODUCTION

Types of MOOC's available

C-Moocs and X-Moocs

- **C-MOOCs**- The term C-MOOC refers to a MOOC designed to emphasize connecting learners. C-MOOC stands for Connectivist MOOC. C-MOOCs are built upon the idea and platform originally envisioned by George Siemens.
- **X-MOOCs**-X-MOOCs have their background in the rise of open course ware



1. INTRODUCTION

Pros and Cons of MOOC'S

Advantages

- Designed to ensure students keep-up
- Offers interesting business opportunities
- Allow teachers to make the most of classroom time in blended classes
- Creates a dynamic archive

Disadvantages

- ▶ Makes discussion a challenge
- ▶ Make it easier for students to drop out
- ▶ Students must learn to be responsible for their own learning
- ▶ It sometimes involves costs

2. STATE OF THE ART

- A **MOOC** has **two basic models**.
 - **The first** involves Web-based and emailed course content, with assessment achieved through automated exams. A notable example is Circuits & Electronics, one of the first MOOCs offered through EdX.
 - **The second “connective”** learning model has less structure and content. The learning presumably occurs via crowd-sourced interactions through blogs, threaded discussion boards, and email.
 - In either model, **graduate assistants** might moderate the interactions and answer questions, but instructor-initiated interaction is rare—if not nonexistent.

2. STATE OF THE ART

- While online or remote delivery of college course content has been available for many decades, MOOCs differ in terms of **scale and no/low-cost.**
- **Massive enrollments allow** world-class faculty and curricula to be accessible to anyone.
- MOOCs **can be taken anywhere** that has Internet access, including sparsely populated areas, and those locations where it would be impractical to build a physical university.

2. STATE OF THE ART

- There are several major players in the MOOC space, including
 - **Coursera**, a consortium of 33 colleges and universities;
 - **EdX**, created by Harvard and MIT;
 - **Kahn Academy**, backed by Google and Bill Gates; and
 - **Udacity**.
- Currently, most MOOCs are taken as non-credit bearing, though several universities have recently begun awarding credit for completing certain MOOCs, passing additional tests, and providing certain authenticating artifacts.

2. STATE OF THE ART

- MOOC courses can theoretically **scale up without limit**, from **more than 100,000 students today to millions in a single course**.
- **To date**, millions of course enrollments in MOOCs have been recorded, but it is **unclear** how many students have actually completed these courses and how many credit hours have been earned worldwide.

3. CHALLENGES

- Typical completion rates for MOOCs are less than **8 percent** of enrolled students, which may include the curious as well as committed and ill-prepared students.
 - These **completion rates are an order of magnitude lower** than in a traditional college course.
- **Assessment is another challenge.**
 - In order to allow for scale, MOOCs typically use **multiple-choice, matching, simple fill-in-the-blank, and other forms of testing in which scoring can be automated.**
 - Some MOOCs require deliverables that must be assessed manually by instructors or teaching assistants, but these artifacts significantly limit course size.

3. CHALLENGES

- thAuthentication of students is problematic, though this same problem exists for any online course.
 - There are solutions available, such as **using certified testing centers or biometric authentication**. But these solutions can be expensive and logistically challenging and will limit the MOOC scale-up factor.
 - Since most MOOCs **use fully automated test grading**, it is possible that an oracle **will one day fool** a MOOC test engine.

3. CHALLENGES

- **Critics of MOOCs highlight the lack of instructor-student and student-student interaction.**
 - While it is possible for some students to interact through group assignments, threaded discussion boards, and direct email, instructor-to-individual-student contact is limited to a select few students.
- **In the United States**, the Department of Education requires courses to have “significant instructor-initiated contact” in order for that course to be approved for financial aid credit.

3. CHALLENGES

- Whether the MOOC is hosted by a not-for-profit entity or a for-profit business, the finances have to make sense.
 - It takes significant investment to build and maintain the MOOC platform, fill course content and pay support staff, teaching assistants, and professors.
 - A pure philanthropic model would see the financial burden met entirely through grants, donations, and earnings on some foundation.
 - Some small financial successes have been reported, but no one has figured out how to make the finances work for MOOCs once they scale up and for the long run.

4. POTENTIAL DISRUPTIONS

- With no tuition required, the convenience of online learning, and access to world-class faculty,
 - **MOOCs** have the potential to draw vast numbers of students away from traditional universities.
 - A significant migration of students to **MOOCs** would threaten the viability of some traditional colleges and universities, but we believe that there is a less than 10 percent likelihood that this disruption will occur.

4. POTENTIAL DISRUPTIONS

- **M****O****O****C**s also threaten to change the role of faculty, student, and teaching assistants and the nature of the university.
 - **For example**, one quality metric for traditional universities is the average number of students per class, with a lower ratio considered desirable. Automated course delivery and grading allows for immense up scaling of course enrollments.
 - Does the growth of **M****O****O****C**s mean we will need fewer professors but more teaching assistants?

4. POTENTIAL DISRUPTIONS

- There **may be pressures** on traditional universities to scale course sizes by adopting partial MOOC attributes (e.g., more automated grading) but still preserving a high level of instructor-student interaction.

6. SUMMARY

- **MOOCs** have the potential to transform the higher educational landscape, but it is too soon to tell how significant this impact will be.
- **MOOCs** will likely play a future role predominately in continuing education, course prerequisites, and, on a limited basis, credit-bearing courses.
- It is unlikely, but possible, that complete credit-bearing courses from accredited universities will be available through **MOOCs** before 2022.

Tanya Jawab

The End