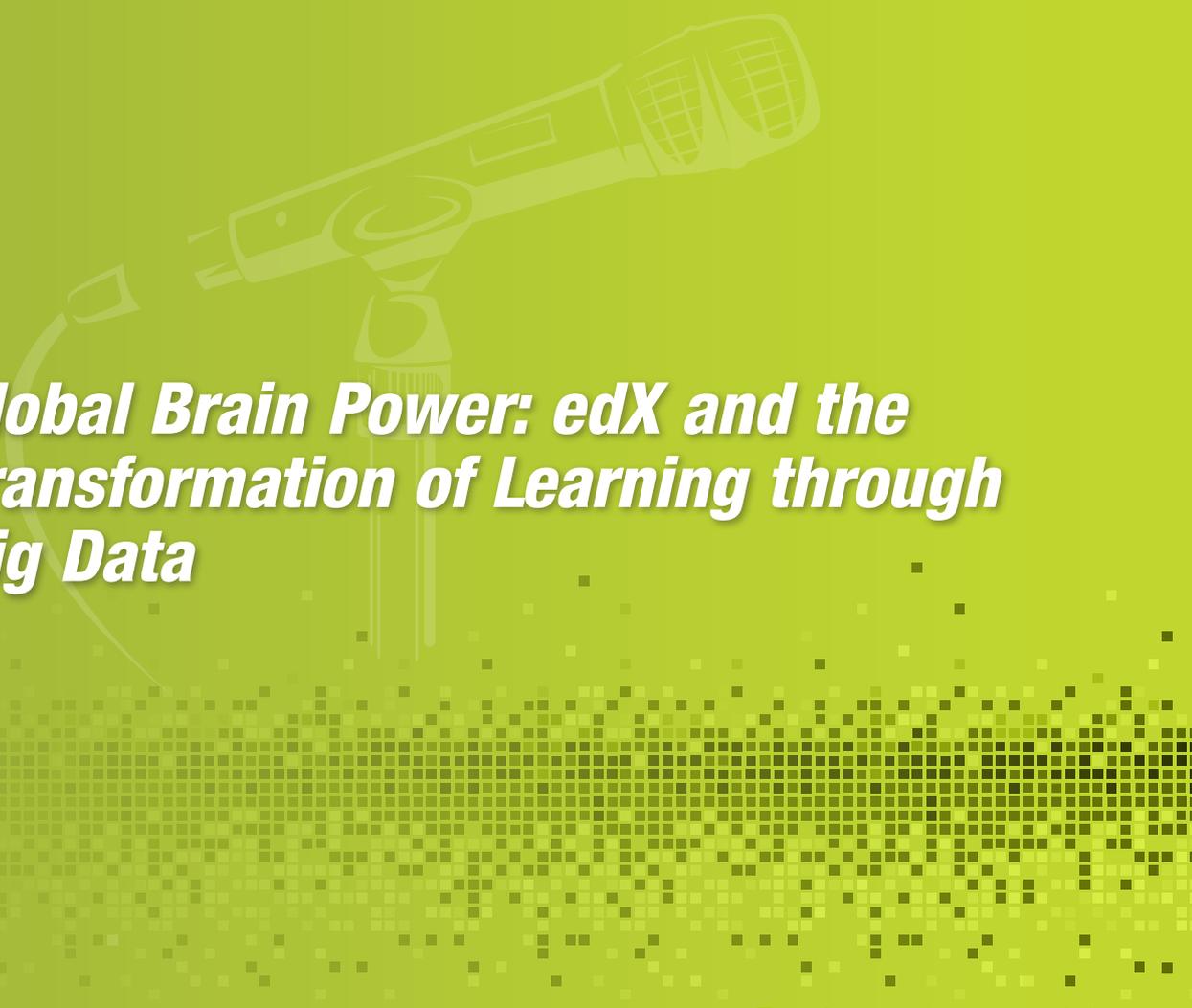


DIGITAL LEADERSHIP

An interview with

Anant Agarwal

President of edX



Global Brain Power: edX and the Transformation of Learning through Big Data



Anant Agarwal

President of edX

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A key objective of edX is to improve the learning experience on campus by understanding how people learn.

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The Journey So Far

Capgemini Consulting: What was the rationale behind the creation of edX?

Anant Agarwal: edX has been created with two objectives in mind. The first is to give access to high-quality education to as many people as possible. We aspire to reach a billion people over the next decade. The second objective is to improve the learning experience on campus by understanding how people learn. We conduct research on how technology can transform learning and the way teachers teach on campus.

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Nearly 155,000 students signed up for the inaugural course – more than the total number of MIT alumni across the university’s 150-year history.

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Capgemini Consulting: Can you give us an idea of the level of success you have seen so far?

Anant Agarwal: EdX has grown rapidly since its launch a year-and-a-half ago. The number of enrollments from our inaugural course – on circuits and electronics – has been phenomenal. Nearly 155,000 students from 162 countries signed up for the course. This is more than the total number of MIT alumni across the university’s 150-year history. Currently, we have over 1.4 million users and 2.3 million course enrollments from around the world. Our learners vary from those who want to audit a course to those who want to obtain a certificate (25 to 30%). Approximately 7% of the overall pool achieves a certificate.

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Capgemini Consulting: What are the courses that you offer on this platform?

We have extended our course offerings across a wide range of disciplines. From science to art to technology, you can find it all on edX. The courses now range from fields such as neuroscience to Chinese history, from American poetry to linear algebra.

We now have 29 universities as members of our group of partner universities, collectively called the ‘xConsortium’. And we keep adding more universities.

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Recently, the French Ministry of Higher Education announced that France is creating a national online learning platform called ‘France Université Numérique’ based on the open source platform from edX. Over 100 higher education institutions throughout France are expected to participate in this initiative. Similarly, a consortium of leading Chinese universities selected the open source platform from edX to power China’s largest online learning portal, XuetangX.



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Analyzing the Big Data from the students' clickstreams allows us to gain insights into how students learn and collaborate.

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Applying Analytics to Transform Higher Education

Capgemini Consulting: You mentioned collecting and analyzing data to enhance the overall learning experience. What type of data do you typically gather?

Anant Agarwal: We look at students' clickstreams, which are essentially recordings of when and where users click on a particular page. We record every click that a student makes as they navigate through a course's resources, including assessments, e-texts, and online discussion forums with their fellow students. Then, we also analyze students' homework, exam and lab scores, and student comments on discussion forums. We also collect users' demographic data such as age, region, degree status and reason for taking a course when they register on edX.

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This demographic data helps us customize courses according to the age bracket. We also observe the number of attempts students have made before they got an exercise right, and if they got it wrong, what alternatives they used to try and find a solution. For instance, did they go to the textbook, go back and watch the video, or did they go to the forum and post a question?

Analyzing behavior patterns of students helps us understand what solutions students turn to when they are faced with a problem. This helps us focus on prioritizing student-preferred solutions over others. There are over 1.4 million students on edX, so collecting all this information creates a large dataset. We analyze all this big data to gain insights into how students learn and collaborate, and then aim to use these insights to enrich the quality of courses we offer.

Capgemini Consulting: What are the preliminary insights that you have already gathered from all this data?

Anant Agarwal: We found that more than half of the students in our inaugural circuits and electronics class started working on their homework before watching video lectures. It appears that students get more excited about learning when they try to solve a problem – it's almost like a puzzle. We are now looking at whether professors should assign homework or in-class assignments before the lecture, instead of after.

We also found that a student who worked offline with someone else in the class – or with someone with expertise in the subject – scored almost three points higher than someone working alone. Basically, collaborating with another person, whether novice or expert, strengthens learning.



edX : Transforming Education Digitally

Gathering Online Student Data to Improve Learning Outcomes

Over **1.4 million** users,
with **2.3 million** course enrollments
globally, **generating data on:**



Applying Big Data Analytics Already Revealed Key Insights



> 50% of students
worked on their homework
before watching lectures.

Students collaborating
offline with others
scored **3 points** 
higher than students
working alone.

Classroom sessions focusing
on **collaborative problem
solving** are more beneficial than
understanding
basic concepts.



The Future: A Blended Mix of Technology and Classroom

Flipped Classrooms

Students learn new content online and use classroom
sessions to solve problems collaboratively.



Continuous Learning

Students taking online courses before they join
universities and continue learning as alumni.



Capgemini Consulting: Are you experimenting with new forms of campus learning based on these findings?

Anant Agarwal: Our research findings indicate that classroom sessions should focus more on collaborative problem solving, rather than on understanding the basic concepts of the course. The University of California, Berkeley, among other xConsortium members, is already experimenting with this “flipped classroom” method of teaching. In this emerging format of classroom learning, students learn new content online by watching video lectures, and studying the background materials. The classroom learning focuses on solving problems under the guidance of the professor and through interaction with other students, thus creating a collaborative environment to strengthen learning.

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A key finding is that classroom sessions should focus more on collaborative problem solving, rather than on understanding the basic concepts.”

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Online Learning through MOOCs

Capgemini Consulting: MOOCs have seen tremendous success in recent times. Is it possible that MOOCs will cannibalize the traditional residential education system?

Anant Agarwal: MOOCs will not replace a conventional on-campus education. But we do foresee a revolution in the way education is implemented on campuses; especially with the increasing use of digital technologies in traditional classrooms. We believe the future of classrooms will be a blend of traditional and online learning approaches. Some of our early research around these so-called blended or hybrid courses suggests that learning outcomes improve when they are used on campuses. For instance, teachers can leverage the edX platform to make their courses more accessible by referring students to specific online courses to supplement their skills and stay up-to-date. Overall, I think digital learning will help improve both on-campus and online learners globally.

Capgemini Consulting: Being a not-for-profit venture, how do you plan to make edX sustainable?

Anant Agarwal: We are establishing revenue models across both the B2B and B2C segments. In the business-to-business segment, edX is establishing a business model by providing platform support and services to a wide variety of organizations including corporations that use our platform for internal training and intergovernmental organizations like the IMF and even governmental institutions like France’s Ministry of Higher Education.

In the business-to-consumer segment, edX is conducting a pilot around the student identity verification process. The idea is to offer ID-verified certificates to students that complete a course. The new functionality uses webcam photos to confirm student identity and provides a linkable online certificate for a fee.

To make it possible for our partner universities to offer more courses on edX, we work on the basis of an equal revenue share with them. These initiatives are resulting in a self-sustaining business model.

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Early research suggests that blending traditional and online education improves learning outcomes.”



Capgemini Consulting: How do you foresee education changing over the coming years?

Anant Agarwal: This is a time of disruption and experimentation in education. Things are going to be moving very quickly. In the short term, I anticipate on-campus universities to increasingly use digital technologies and MOOCs as part of their curriculum.

In the long term, I visualize a movement towards what I call 'continuous education'. This would question an existing model – for instance, why should students attend university for four years at the beginning of their careers? As part of the new arrangement, before students go to university, they would take a few online courses, perhaps

from the same university. Then they would experience on-campus study, attend blended courses, interact with professors and conduct research. After graduating from university they would undergo 'continuous education' by taking online courses as alumni from the same or another university. For instance, we have started an initiative called 'BostonX' in partnership with the city of Boston to create learning centers in neighborhood community centers where people can meet, take courses online from local universities. Professor and student volunteers may visit these community centers and lend support so that continuing learners can take courses in their interest areas and form communities.

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President of edX

edX is a not-for-profit organization, founded by Harvard and the MIT in May 2012, which aims to expand access to education for everyone while improving educational outcomes on campus and online.

edX's online learning platform recently launched a series of Massive Open Online Courses (MOOCs), which have sparked widespread interest. We spoke to Anant Agarwal, President of edX, to understand edX's objectives and activities as well as the future of education.

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