OPEN EDUCATION:
THE NEXT IN HYBRID LEARNING

A Platform That Brings Alive the True Potential of Online Education

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Abstract

Recognizing the Limits of E-Learning: Open Education As the Solution

The COVID crisis forced the world to adopt new ways of functioning, overnight. Among the most disrupted were educational institutions. They had to adapt to remote learning models rapidly. As a result, the transformation came at the cost of a cohesive vision, foresight and long-term planning, with numerous gaps in the learning experience. These could be disjointed collaboration tools, delays in communicating plans and schedules to students, inconsistencies in assessment administration and the inability of teachers to keep students focused with constant virtual distractions.

There's also the matter of combating general fatigue due to the absence of real-time interactions as well as lack of peer learning opportunities. There is no time like now for the higher education sector to solve these problems, take a long-term strategic view and use this as an opportunity to reimagine the virtual elements of the learning ecosystem as well as carve out different innovative methodologies to augment education.

Open Education is that adaptive, collaborative experiential platform that supersedes MOOCs and online marketplaces – a space marked by open content and connected ecosystem. This paper discusses the key characteristics of Open Education, what the strengths are for a platform-driven approach and the potential metrics to measure its success.

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Context

A Brief Look at MOOCs and Online Education: Their Evolution, Advantages and Disadvantages

Emergence of Online Learning

HISTORY OF MOOCs: Phase I
The Rise of Web-Based Learning

Online learning started gaining popularity in the 1990s when courses were delivered over the web. By around 2010, about one-third of post-secondary students in the US had signed up for online courses. Despite being around for years, the interest in Massive Open Online Course (MOOC) platforms like Edx, Udacity, Coursera and Khan Academy, peaked in 2012 and it became 'The Year of the MOOC'. Education could no longer be contained within the four walls of a classroom. Courses from universities like MIT and Harvard that felt inaccessible to most students earlier, were at students' fingertips. Organizations like SWAYAM (India), XuetangX (China), Future Learn (UK), and others emerged in the regional space. However, despite its popularity, engagement was low and course completion eventually plummeted to 3.13%.

HISTORY OF MOOCs: Phase II
The Rise of Learning Aggregators

Open marketplaces like Udemy, Lynda, PluralSight and Skillshare, that functioned as an intermediary between learners and teachers came up. Courses offered on these marketplaces evolved faster than universities, and students got access to new skills and topics such as digital marketing, SEO, advanced programming and VR. Marketplace platforms like Udemy offered teachers a unique opportunity to monetize their knowledge without the hassle of finding students and generating traffic.

Later, SAAS platforms such as Teachable, Podia, Thinkific, emerged and allowed teachers everywhere to create an online business without spending time on creating software infrastructure. With such platforms, universities could go online with all software infrastructure necessary to

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build an online school including curriculum construction, payment method, website, video player and tests.

ADVANTAGES

01 Students can collaborate with their peers from different parts of the world

02 They help people who have barriers to learning, such as lack of funding and un-accessible geographical location

03 Most MOOCs are free

04 They are designed to be interactive

DISADVANTAGES

01 They make it easy for students to drop out

02 MOOCs provide no active feedback due to the large number of students

03 Students need to be responsible for their own work because MOOCs provide self-directed learning

04 Its hard to facilitate a meaningful conversation

Figure 1) A Quick Snapshot of MOOCs Pros and Cons

EVOLUTION OF MOOCs: Growing Challenges in Learning

High dropout rates for most online courses are just an indicator of multiple variables going wrong in the current e-learning systems. Figure 1 has some comparisons of MOOC advantages vis-à-vis the disadvantages.

The lack of customized courseware and personalized attention from a tutor as well as the difficulty in tracking students' assignments and involvement, all necessitate a system that eliminates these gaps and democratize learning further by bringing in learners with disabilities as well as learners in remote locations with poor internet connections, taking into account language inclusivity.

WHAT LIES BEYOND MOOCs: Open Education a Whole New Way To Learn and Teach Online

All these stages have led to the new avatar of Open Education - one that is powered by AI and analytics, and unbound by factors like geographical location, institution, fee and even resources. Open Education has taken a new turn in the age of disruption.

Introduction to Open Education

A Platform-Based Approach To Overcome Limitations of Online Learning

Open Education is a philosophy about the way people create, share and build on knowledge. Advocates of Open Education believe that high-quality educational experiences and resources should be accessible to all without barriers like high costs and legalities.

It creates an ecosystem open to all content providers, teachers and learners. Today, Open Education is powered by a platform-driven approach and stands on modern technologies and solutions such as Open APIs, Microservices, Data Analytics and Machine Learning. This system delivers a scalable and seamless experience for all users.

Technological advancements have created a new normal in e-learning, along with trends like Hyperscale Cloud and Hyper-Personalization for an impactful customer experience. In this age of digital disruption,

the Open Education ecosystem promises opportunities for all the stakeholders involved. The reach of the internet worldwide and access to smart mobile

devices has accentuated creation and sharing of knowledge. Let us see some of the important characteristics of the Open Education ecosystem.

Open Education – Characteristics

a. Open for Learners:
Many MOOCs offer their content online and keep it available on their own portals. The responsibility of analyzing, comparing and identifying the desired content lies with learners. In contrast, an Open Education Ecosystem stitches together content from multiple sources and offers it to learners seamlessly. It can be compared to Trivago, which offers an integrated view of available facilities from multiple lodging providers. Whereas, in an Open Education ecosystem, a learner is enabled to view and compare content from multiple sources on parameters as detailed in Figure 2.

Primary content coverage and course structure

Learning outcome

Duration of course

Rating and learners' feedback

Price and mode of delivery

Certification offered

Figure 2) Transparency on Various Parameters of Courseware Provided to Learners Through Open Education

b. Open for Education Providers:

Open Education empowers content creators and teachers to share their expertise easily with learners. Like a 'publish-subscribe model', an education provider can publish content that is automatically sent to learners who have subscribed to the topic/ theme. While open marketplaces like Udemy, Lynda and others have made this possible to an extent, Open Education provides ease of use. It factors in how quickly and easily a content provider can make their solutions and courseware available to learners, Figure 3 details this out.
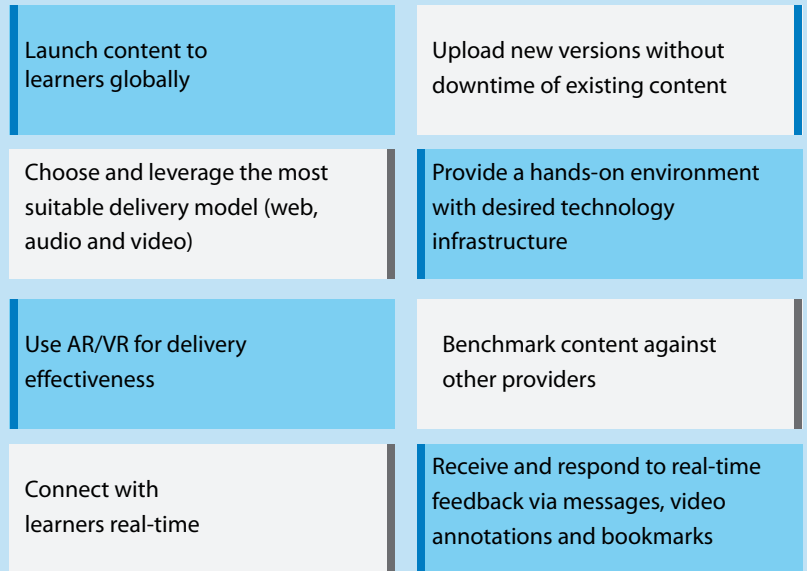
Launch content to learners globally	Upload new versions without downtime of existing content
Choose and leverage the most suitable delivery model (web, audio and video)	Provide a hands-on environment with desired technology infrastructure
Use AR/VR for delivery effectiveness	Benchmark content against other providers
Connect with learners real-time	Receive and respond to real-time feedback via messages, video annotations and bookmarks

Figure 3) Factors In Courseware Delivery That Open Education Takes Care Of

c. Open for Integration and Customization:

Open Education enables learners to seamlessly curate content from multiple providers. Currently, it is challenging for a learner to integrate content from diverse MOOCs and open marketplaces. Open Education can empower learners by bringing all these pathways and courseware together. Figure 4 has more on this.
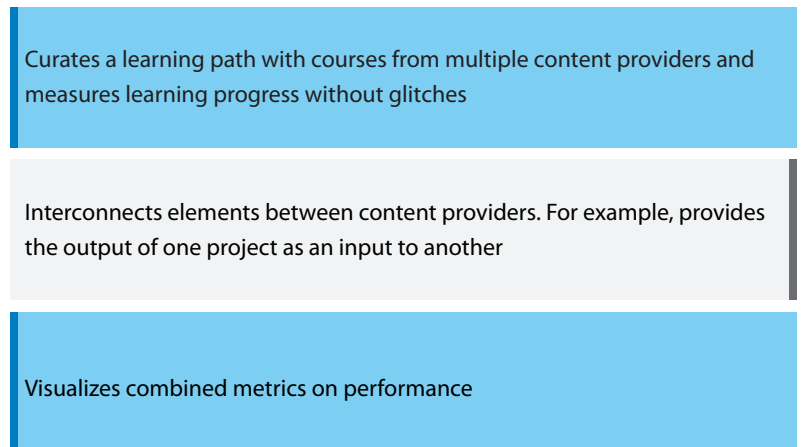
Curates a learning path with courses from multiple content providers and measures learning progress without glitches

Interconnects elements between content providers. For example, provides the output of one project as an input to another

Visualizes combined metrics on performance

Figure 4) How Open Education Platform Creates a Unified Pathway for Online Learners

d. Open for Analytics:

Analyzing diverse types of data available in an Open Education ecosystem will help to guide learners, teachers, administrators and researchers to take informed decisions. Analytics can be broadly classified into three types as described in Figure 5.

Learner Analytics: Analytics and data about learners such as learner profile, learner's progress and batch progress. The objective is to motivate the learner and track the learner's progress.

Program Analytics: Course ratings, curriculum relevance and program success. The objective is to create an intelligent curriculum.

Administrative Analytics: Program effectiveness, course management, learner management and mapping job profiles. The objective is to align in the direction set by stakeholders.
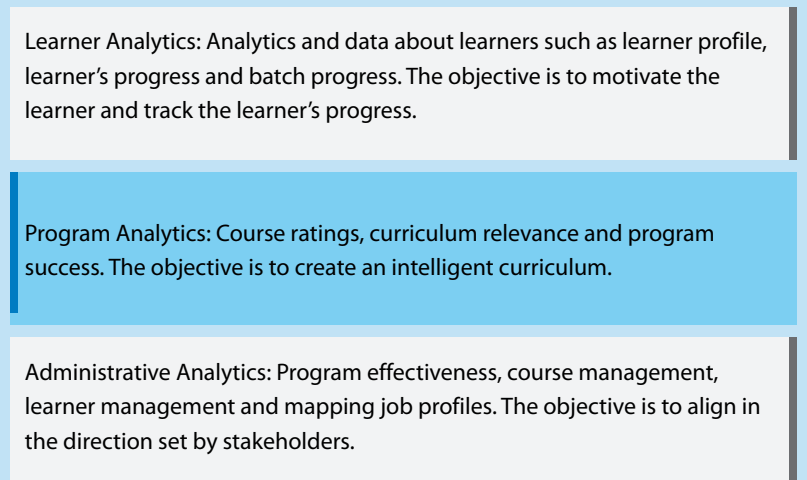
Figure 5) Types of Analytics Used in an Open Education Ecosystem

Analytics and data play a huge role in the education ecosystem, and can create an efficient platform. Explore the following organizational aspects that data analytics can bring into an Open Education ecosystem:

- Provides prompt and relevant feedback to learners

- Gives insights on module relevance and recommends remix for creating a learning path

- Identifies and tags bad content so that it can be revised

- Detects slow performers and reduces the number of dropouts

- Suggests recommendations for content quality and content restructure

- Ensures that all stakeholders evaluate their progress

- Provides hyper-personalization of content based on learner's needs, progress and profile

- Creates customized recommendations for learning

- Generates data-driven suggestions for program effectiveness

- Integrates social media data into decisions (using social influencers)

- Predicts learner success based on past performance for future learners

- Automates the creation of mentor-mentee model

- Recommends jobs based on learning

- Analyzes learner sentiment on topics/courses/programs

Open education brings together a massive ecosystem of several entities in the industry together – academia, learners, teachers, course creators and stakeholders. This, of course, comes with challenges as it integrates all these entities into a system to ensure a seamless flow of information. Information needs to be continuously stored, analyzed and shared to ensure operational efficiency. Constant collaboration between entities and a proper learning framework are key to a strong open education system. The desired seamless user experience is possible with an innovative platform and a platform-based approach.

How Open Education Is Better Than MOOCs

The Differentiating Factors That Make OE Platforms Better Suited for New-Age Learners

A platform-based approach can go a long way to create a seamless user experience. In contrast to a service-centric approach where one producer offers services to multiple consumers, a platform-based approach enables multiple content producers to deliver value to multiple consumers.

The concept of APIs and platforms is not new. Platforms and open APIs have uplifted and revolutionized many industry verticals like finance and retail. Open APIs applied to banking, known as open banking, is a practice that provides FinTechs with direct access to consumer banking, transactions and financial data from banks and its allies through APIs. It is known by different names across the world - PSD2 across Europe, Open Bank Project in the UK and UPI in India. In each country, there is a need for a platform to standardize APIs, share banking and consumer data securely and regulate banks to comply with the set standards. Following the ideology, an Open Education platform provides Open APIs in the field of education to strengthen the education ecosystem by unlocking valuable content and data.

What then, are the differentiating factors you should look for in an ideal Open Education platform?

a. Ecosystem Focus

Instead of providing content, the focus lies on enabling content sharing among education providers and learners. It should provide automated onboarding to users with necessary support of Open APIs, documentation and a sandbox environment for testing.

b. Seamless Self-service Open API

Content providers and curators are enabled to access the breadth of platform capabilities through an intuitive self-service Open API. This API is designed to provide the right abstractions for users, thereby shielding them from unnecessary details or underlying architecture complexity. SURF (https://www.surf.nl/en), a Dutch organization in the field of education and research, has initiated the standardization of APIs in education. (https://openonderwijsapi.nl/en/api/).

c. Hyper Scalability

The platform must be resilient, performant and scalable to support rapid growth in usage, which gives users confidence in the quality of the platform and a willingness to continuously interact with the platform.
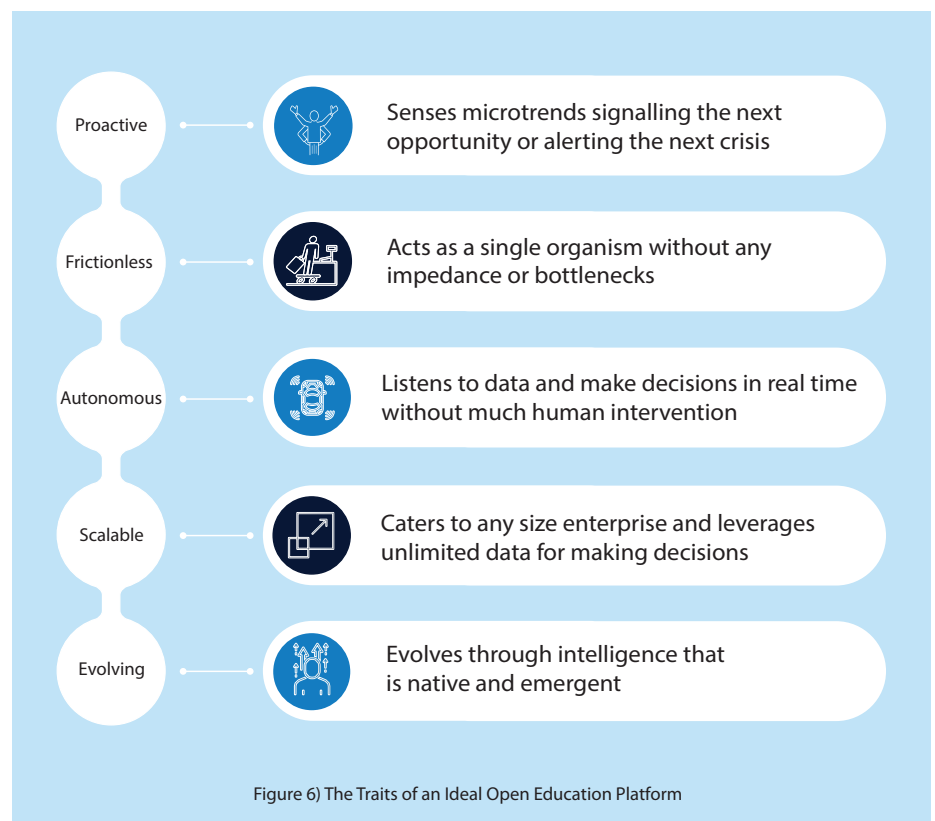
d. AI-Driven Data Analytics

The power of data analytics in shaping actions and recommendations, along with benefits of AI in solving complex problems, will add immense value to the platform in terms of ensuring enhanced customer experience and making smart business decisions.

e. Hyper-Personalization

Modern technologies like AI are capable of processing massive amounts of data in real-time, giving the ability to create personalized messages and targeted campaigns. It encourages higher involvement with the platform and increases the effectiveness of the system.

Figure 6 encapsulates the traits of an evolved, intelligent, connected, collaborative, experiential and immersive online learning and teaching platform.

Proactive	Senses microtrends signalling the next opportunity or alerting the next crisis
Frictionless	Acts as a single organism without any impedance or bottlenecks
Autonomous	Listens to data and make decisions in real time without much human intervention
Scalable	Caters to any size enterprise and leverages unlimited data for making decisions
Evolving	Evolves through intelligence that is native and emergent

Figure 6) The Traits of an Ideal Open Education Platform

Inside the Open Education Platform

The Components That Define the Next Generation of E-Learning Systems

The OE platform sits in the center of the ecosystem, accessed by multiple stakeholders as shown in Figure 7. Content can be pushed by or pulled from existing MOOCs, learning marketplaces and upcoming content providers via messaging channels like Kafka and/or self-service APIs. At the other end, consumers can access and interact with content through different devices and channels like mobile apps, web applications, voice assistants and browsers.

The platform houses microservices and frameworks that provide services like course management, user management, faculty management, learning programs, assessments, certifications and other details, as shown in Figure 8. These are secure microservices that provide self-service Open APIs for consumer apps running on different devices and data analytics.

Figure 8 is a quick snapshot of the Open Education platform in action, highlighting how it is more sophisticated and robust as compared to MOOCs.
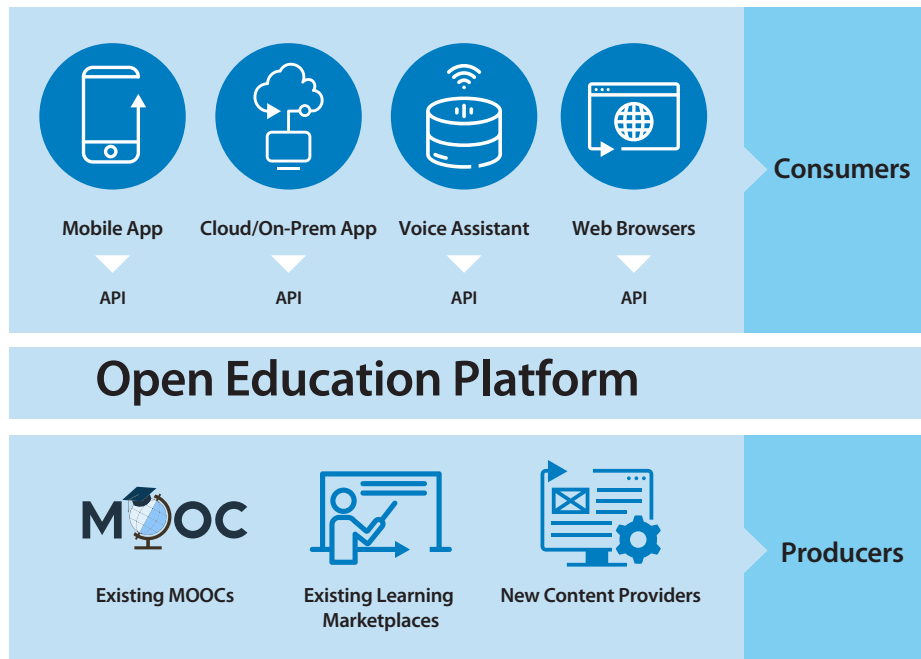
Figure 7) Components and Stakeholders of an Open Education Platform
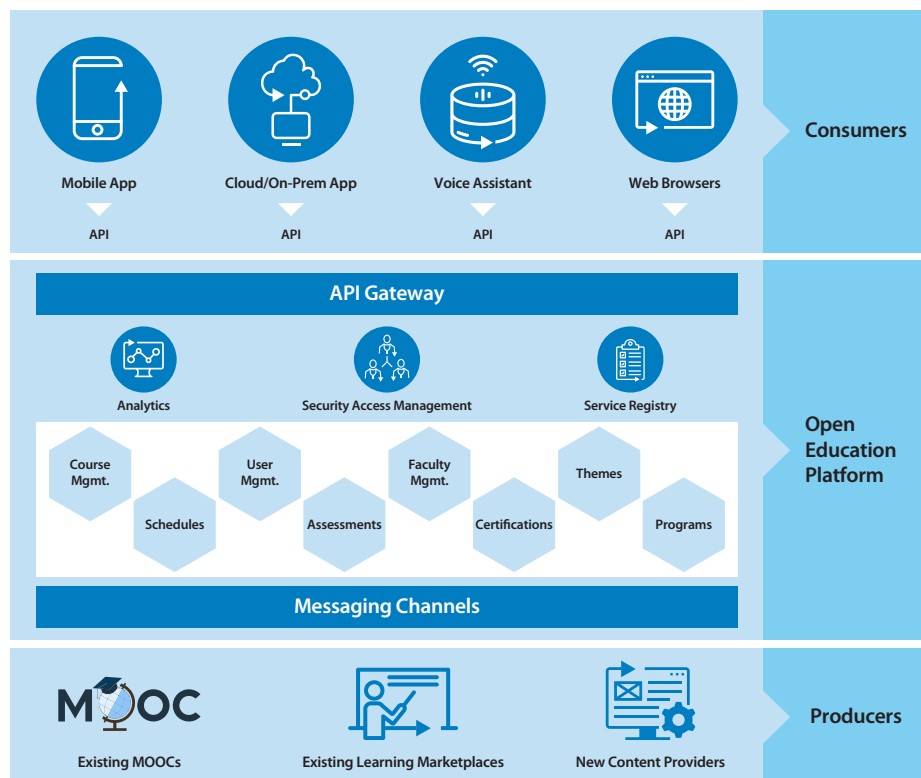
Figure 8) The Framework for Open Education Platform

Figure 9 shows details of the Data Analytics component of the platform. It should have capabilities to ingest content from various disparate sources, integrate legacy applications, process and share content as efficiently as possible to the various entities in the system.
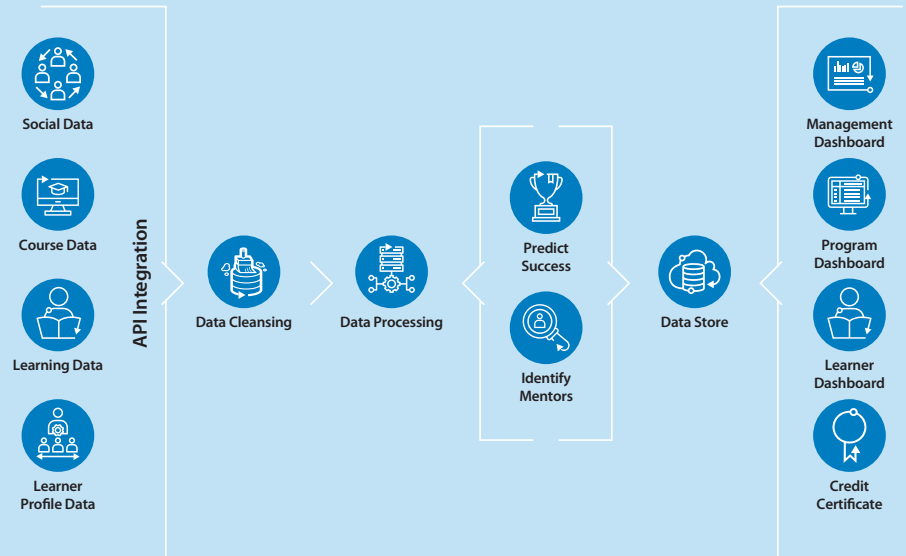

Figure 9) The Backbone of an Open Education Platform

METRICS FOR AN OPEN EDUCATION PLATFORM

Measurability To Ensure Continued Systems Improvement

An organisation can predict whether it can deliver a particular outcome with Open Education platform using outcome-based metrics. Consider the following key metric perspectives that can be easily applied to measure an Open Education platform's success.

Learner Perspective:
- Has a learner achieved the desired learning outcome?
- How can you measure a learner's success?

Content Perspective:
- How relevant and appropriate is the learning content?
- How authentic is the content and content provider?
- How frequently is the content updated?

Platform Owner Perspective
- How many valuable interactions are happening on the platform?

- Is the platform workflow efficient and traceable?
- Can the platform scale-up to support a dynamic increase in the number of users and content?

Ecosystem Perspective
- Are the content and learning outcomes relevant to universities and organizations?

- What value-add does the Open Education platform implementation bring to the ecosystem?

The metric framework should be formulated in collaboration with all involved entities, accompanied by a real-time dashboard view for continuous monitoring and alignment. It will ensure the platform constantly evolves to service the needs of teachers and learners better as time goes along.
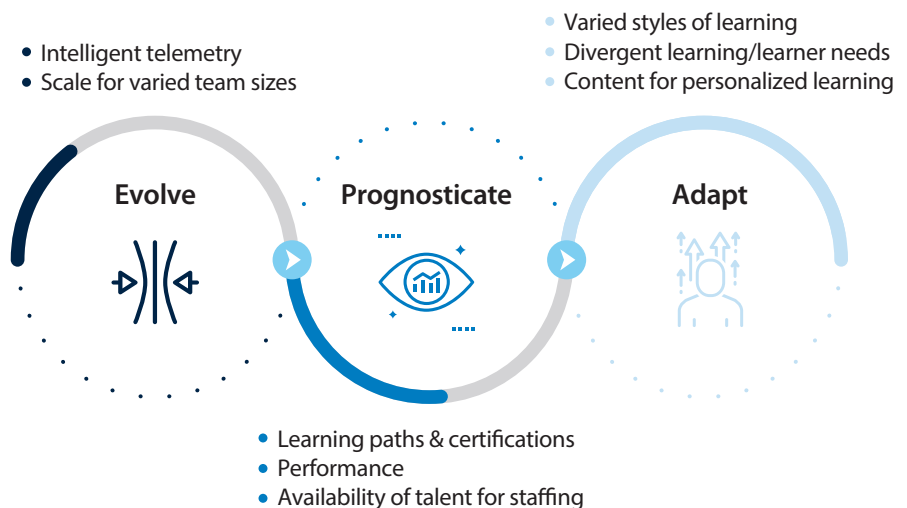

- Intelligent telemetry
- Scale for varied team sizes

- Varied styles of learning
- Divergent learning/learner needs
- Content for personalized learning

Evolve   **Prognosticate**   **Adapt**

- Learning paths & certifications
- Performance
- Availability of talent for staffing

Figure 10) The Three Aspects of an Open Education Platform Bettered by Regular Assessments

INFOSYS SPRINGBOARD: THE NEXT IN OPEN EDUCATION PLATFORMS

Exploring the Flagship Platform To Accelerate 21st Century Digital Learning

Infosys Springboard is a flagship digital learning platform to empower people, communities and society with skills to be successful in this new era. Powered by Infosys Wingspan, our integrated digital learning and collaboration platform, Infosys Springboard, includes content spanning across digital learning, emerging technologies and life skills. This program is led by a dedicated team of experts collaborating globally with the Infosys Education Training and Assessment (ETA) team, curriculum partners, non-profits and a global network of leading educational institutions.

In India…

Infosys Springboard brings digital and life skills for students from class 6 to lifelong learners. Delivered free through Infosys CSR commitment to empowering 10 million-plus people with digital skills by 2025, it provides a holistic set of courses, developed in collaboration with world-leading digital educators like Coursera and Harvard Business Publishing. It is fully aligned with India's National Education Policy 2020. The learning program is particularly well-suited to growing vocational skills in addition to soft skills.

In USA…

The initiative aims to democratize access to digital content that empowers learners across the spectrum from K-12 students and teachers, to post-secondary learners and educators, all the way to professionals seeking technology-enabled opportunities.

In Europe…

As a part of Infosys' Corporate Social Responsibility (CSR) charter for Europe, Infosys Springboard is the digital inclusion platform for youths, SMEs and the unemployed. The program is focused on three areas with varied initiatives designed to lead to better outcomes for individuals, communities and businesses.

LESSONS FROM IMPLEMENTING SPRINGBOARD

What It Takes To Create a Thriving, Successful Online Education Platform

For an effective Open Education implementation, a shift in the mindset and role of governance is as critical as design and technology. Open Education requires an open mindset from all stakeholders - learners, institutions and the entire e-learning industry - for the entire ecosystem to exist and work seamlessly. Content providers need to open their content and allow integration with content from peer providers. To work together and engage as a community, competitive barriers must come down. Platform owners such as government entities and independent players can deliver value out of the platform by considering aspects like ease of use and accessibility into its design.

By implementing a robust and open-source stack-based platform like Infosys' Wingspan, one can integrate the next-gen, cloud-based learning experience while leveraging their existing learning technology ecosystem. It uses AI-powered search through concepts like topic spiders, navigators and personalized homepages to create a powerful and customized interface for learners and educators. For instance, Springboard offers a holistic set of courses, powered by Wingspan, and augmented through collaboration with other digital content providers.

The following parameters and challenges must be considered to ensure a successful Open Education implementation:

a. **Clarity of Ownership:** There is a need to define ownership and control of various components of the ecosystem. While content providers would be responsible for their respective content quality, a consortium behind the platform can take charge of sponsorship, constant monitoring and upgradation. If large players in academia and corporate come together for ownership, it will facilitate standardization and enrich the platform ecosystem.

b. **Establish Ease of Use:** This is the key to platform usage. The platform should integrate easily with existing and emerging content providers, consumers and stakeholders in e-learning. Allow external developer ecosystems to build on the core platform and extend its offerings into new segments.

c. **Ensure Quality:** A mechanism for regular quality checks must be in place to ensure the aptness and relevance of content.

d. **Maintain Security:** Secure practices must be implemented, and the ecosystem should be audited regularly to ensure the safety of information and that no breaches occur.

e. **Build Trust:** Being a facilitator, the Open Education platform must have a system in place to consider the credibility of content providers. The credibility of certifications and learning recommendations are significant factors in ensuring that all stakeholders gain value from this ecosystem.

f. **Ensure Viability:** A long-term revenue investment strategy, revenue-sharing model between stakeholders and reward mechanism plans need to be in place to ensure continued sustenance of the entire system.

g. **Industry Accreditation:** Learners require recognition of courses in the form of certifications of degrees to be appreciated by organisations. Much of their motivation comes from knowing that their education is relevant to current market needs.

> "
> To work together and engage as a community, competitive barriers must come down. Platform owners such as government entities and independent players can deliver value out of the platform by considering aspects like ease of use and accessibility into its design.
> "

INFOSYS'S PARTNERSHIP WITH NDEAR

Building the National Digital Education Infrastructure

NDEAR is a federated, unbundled, interoperable, inclusive, accessible, evolving system which aims to deliver diverse, relevant, contextual, innovative solutions that benefit students, teachers, parents, communities and administrators resulting in timely implementation of education policy goals. Infosys has partnered with the Indian government to make sure that the digital ecosystem senses and responds to the needs of all stakeholders.

Students benefit from personalized learning, teachers create custom content, complete online assessments and parents follow the performance of their children.

Administrators leverage digital tools to streamline operations.

Figure 11 showcases how NDEAR works at school, after school, at community centers, at home in synchronous/ asynchronous ways, offline as well as online, across physical and digital mediums. It sheds light on the self-service and assisted features of the NDEAR platform as well.
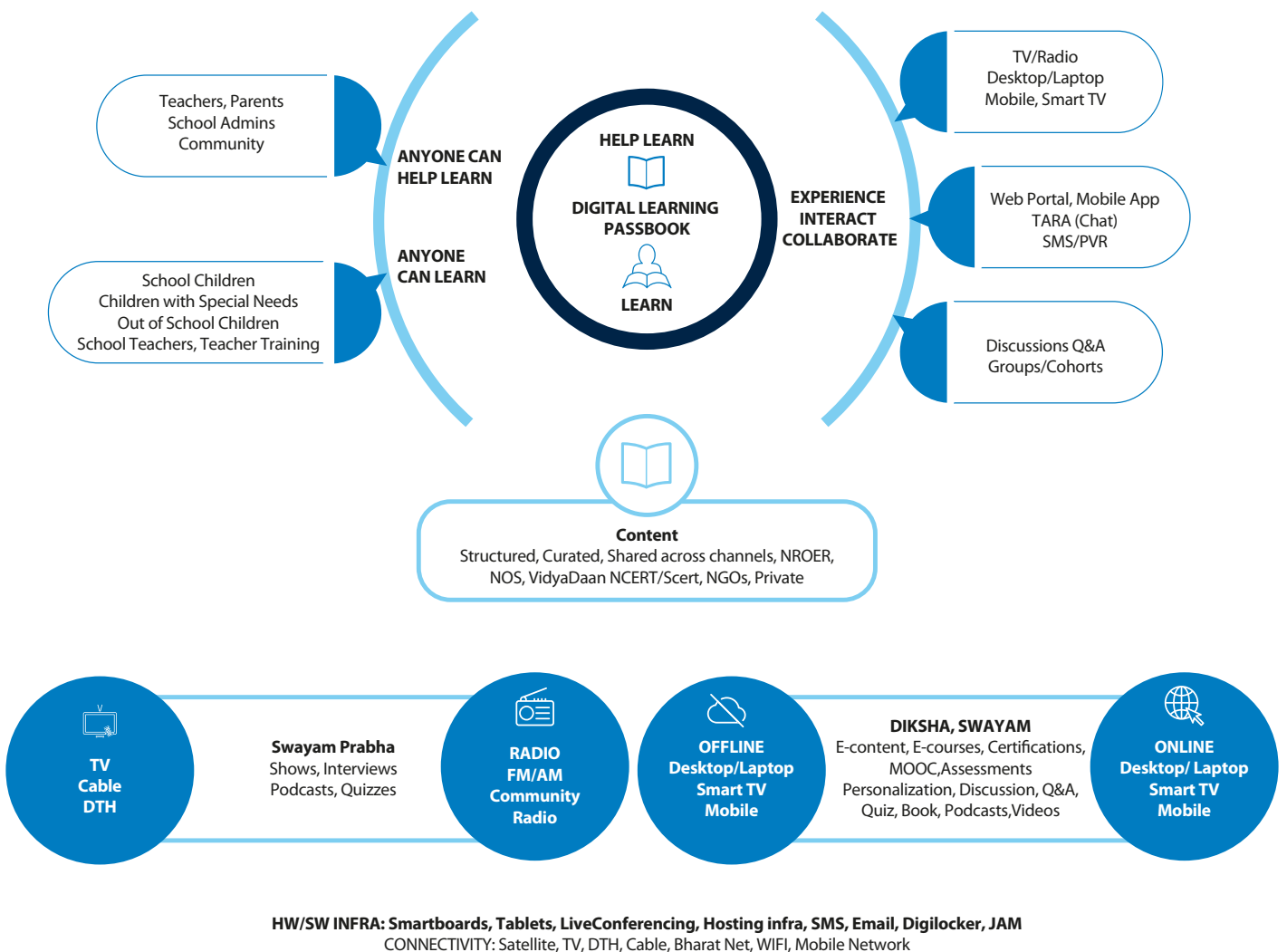
Figure 11) How NDEAR Enables Coherent Multi-Channel, Multimodal, Learning Continuum

IN CONCLUSION

The Shift Is Inevitable: Adopting a Sentient Open Education Platform Can Help Navigate It Better

After the pivot to online learning systems during the pandemic, educational institutions need to evaluate where they are on their long-term digital transformation journey. This is a great moment to think about how tech innovations can help them not just survive but thrive in the new education economy.

The question here is how you can benefit from this open education platform in arming vast swathes of people with the knowledge and skills needed to succeed in the future. See Figure 12 for a quick snapshot of the considerations that go into a modern Open Education platform architecture.

Learning Need Analysis
- Profiling of training audience
- Learning outcomes
- Training objectives
- Scope
- Demonstrable skills

Learning Experience and Content Design and Development
- Design and development of content and assessments

Knowledge Dissemination
- Pedagogy
- Modes of delivery
- Assessment conduction mode and frequency

Measurement of Learning Effectiveness
- Measurement of Return On Expectation (ROE)
- Measurement of Return On Investment (ROI)

Figure 12) The Architecture of Open Education Platforms

In this whitepaper, we have discussed paradigm shifts in education, characteristics of an Open Education ecosystem and the issues that a platform-driven approach can solve. Additionally, we have stated the key metrics, challenges and desired components of an Open Education platform implementation. This new paradigm will usher in newer opportunities and avenues for all the players in this ecosystem. Explore how emerging technologies along with industry collaborations can springboard your next.

Authors and profile

Satheesh

 Satheesh has been working with Infosys for 29+ years. In this long stint he worked on Software Development and Client engagement areas in the first half of his career. He played various roles such as Software Developer, Project Manager, Client Engagement Manager and Delivery Manager in India and USA. In the latter part of his career, he is working in Corporate Education field. He played a significant role in setting up Global Education Center, Mysore and successfully running it over 15 years. Currently he is responsible for fresh hires enablement and continuous education of employees worldwide.

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Ajit has 22 years of industry experience in organizational competency need analysis, design, development and execution of capability building programs. He is part of the core leadership team of Infosys Global Education Centre and heads competency development portfolios on Big Data, Business Intelligence, Mobility, Open Source and Apple technologies.

Manisha

Manisha has been in IT for 25 years, out of which she has spent initial 12 years in Developer and Architect role delivering large scale solutions for multiple US and European clients from Infosys and other companies, and last 13 years as an Educator at Infosys working in the areas of Platform Economy, API Microservices, Salesforce, Digital Process Automation and Cloud Native Development. She holds patent for her work on W3C DOM and is a Certified Google Cloud Architect and SAFe Consultant.

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