An Overview of MOOC in India

Jyoti Chauhan[1], Anita Goel[2]

[1]*Research Scholar, Department of Computer Science, University of Delhi, New Delhi, India*
[2]*Associate professor, Dyal Singh College, Department of Computer Science*
University of Delhi. New Delhi, India
[1]*jyotich2009@gmail.com, [2]goel.anita@gmail.com*

Abstract— *In recent years, the enrolment in Massive Open Online Course (MOOC) has increased tremendously. India after US is dominating the global growth in enrolments. Seeing the growth of enrolment from the country and satisfy their need of education, India has started various projects for offering MOOC courses. Currently, NPTEL, mooKIT, IITBX, and SWAYAM are the platforms used in India for offering courses. In this paper, a theoretical and technical background of these platforms is provided with a discussion of their features. Further, a comparative analysis of the platforms is provided, using web analysis. There are some challenges that are faced in implementing MOOC in India. With the launch of SWAYAM, some of these issues are already addressed.*

Keywords— *MOOC, MOOC in India, NPTEL, MooKIT, SWAYAM, Indian MOOC platforms.*

I. INTRODUCTION

Online learning uses technology for delivering the courses. Education with technology is considered as most promising development in education. With technology globalization, the concept of learning and teaching has undergone a tremendous change. Technological usage in education provides global learning environment, which allows accessing the course material anytime, anywhere, connect other learners, and get access to the content without considering any geographical boundaries. The significant changes in use of the technology in online education has seen emergence of the concept of Massive Open Online Course (MOOC).

Nowadays, MOOC is the most popular way used to offer online courses, globally. MOOC are the massive course designed to support unlimited (logically) participation and are offered through a platform. It has gained lot of popularity since the time of its development in 2008. As of December 2016, approximately 58 million students are registered for the MOOC courses, offered by more than 700 universities and approximately 6850 courses [1], offered by various providers such as, Coursera, edX, Udacity.

India after US, is dominating the global growth in enrollment, accounting for 8,83,400 (27 %) users on edX, 1.5 million [1] on Coursera, and 112,000 (13%) on Udacity [2], from India as in 2016. The massive enrollment is ensuring that the vast majority of the growth in enrollment of learners is occurring from India, and will surely increase in coming years.

In India, the institutes with the organizational capabilities along with the governing authorities are trying to serve the grown educational need of the learners, by offering MOOCs in the country. May be the efforts are in the process to grow yet and serve at the rate of growth in demand. Top institutes (IITs, IIMs, IISC) and authorities (UGC, AICTE, MHRD) have always been involved in the initiative of serving quality education learners in India including traditional as well as the online education. Some of projects serving currently for providing online education are NPTEL, mooKIT offered by IIT Kanpur, and IITBX of IIT Bombay. The most recent initiative started by the government is "SWAYAM", started with a goal to serve at a very large scale and to cope with the increased needs of the learner's.

In this paper, the focus is to explore and compare the MOOC platform used for offering courses in India. These platforms are also compared using the web analysis, where data is collected based on the traffic of the site, offering the MOOC.

Here, introduction of the Indian MOOC platform is presented by unveiling their potential, technology used, and features supported. The author has formulated a list of features provided by each of these platforms. Furthermore, based on the data collected from the web, using a tool, the MOOC platforms are compared. Here, various measures are covered for three categories -*1) Website, 2) Website Audience,* and *3) Traffic Sources*. Each category further has sub categories providing different level of details, for each platform. Also, author has mentioned some of the challenges to offer MOOC in India and confined the solutions for these issues through the SWAYAM platform.

In this paper, Section II provides a discussion on potential of MOOC in India. Section III provides an overview of the MOOC in India with different platforms. Section IV explains what technology is used by these platforms. Section V explains their different features. Section VI provides a comparative study of the platforms, using web analysis. Section VII discusses the challenges for MOOC in India followed by the solutions offered by SWAYAM in section VIII. Section IX states the conclusion.

II. POTENTIAL OF MOOC IN INDIA

MOOC has a huge potential veiled in India. Recent years have seen tremendous hike in the enrolment by Indian students in MOOCs all over world. India is among the leading countries in terms of enrolments in courses offered by many popular MOOC providers including edX, Coursera, and Udacity.

India is second to US, which accounts for 27 per cent with 8,83,400 users of the edX learner base and 1.5 million registered users on Coursera from India, as of December 2016 [3]. The growth of the learner enrollment is evident from the fact that the number of learners increased from 11 percent to 27 percent in just one year for edX. Also, currently 1.6 million users with 112,000 (19%) from India, are enrolled in Udacity's nanodegree (six-ten months) courses including web developer, data analyst, android developer, mobile game developer, etc. [4]. Though Udacity offer only paid courses since 2014, it announced scholarships for 500 students from India to pursue its Android nanodegree programme (priced at Rs.9,800 per month), showing their interest in Indian learners as a market space for MOOC.

Anant Agarwal, CEO, edX, said, "There is a lot of talent in India, but often there are not enough slots for qualified students in colleges, and not enough financial aid "[5]. A study in 2016, reveals that a mere 20 percent of the country's engineering graduates are readily employable, and that over half (53 percent) of arts, science and commerce graduates are unfit for employment [6]. So, MOOC is an eminent alternative for the learners in India to have access to higher education, and to improve quality of their education with online learning. Anant Agarwal says "I believe that India ultimately will be a much bigger market for MOOCs than the U.S".

III. MOOC PLATFORMS IN INDIA

Many initiatives have been taken by the Indian government to provide and support concept of open education. Initially, the objective was to provide open resources in terms of repositories, libraries, educational media files, e-books, etc. These were made accessible for everybody. Some of the efforts in this direction started as National Digital Repository of IGNOU, Sakshat providing e-content, Shishya for XI-XII Standards by CBSE Board, and Vidya Vahini integrating IT into the curriculum of rural schools by providing interactive training and developmental communication. Most of these initiatives started with establishing dedicated department to make education reachable to many learners as much as possible. Some of the common names in this path are, Education and Research Network (ERNET) connecting various colleges and schools by providing network connectivity; EDUSAT, a satellite launched for education in India, Consortium for Educational Communication (CEC), use the power of television to act as means of educational knowledge dissemination; Information and Library Network Centre (INFLIBNET) autonomous Inter-University Centre for connecting university libraries, also it has started several other programs. These all are the initiatives towards open education and education with Information technology still MOOC was out of their reach.

Moreover, the idea of online courses came into play and India started to work for this. In 2013, government launched e-PG Pathshala run especially for postgraduate course and it is managed by INFLIBNET of UGC. It is more of a repository of e-content and assessment than a MOOC. Also, two more course providers are Apna Course and myBskool.com, both are run in India. But both of these are being run for profit and clearly, providing open education is not among their motives.

Therefore, government set off to offer online courses on developing their own platforms. Currently, in India only a handful of universities and institutes have the facilities to start or support such initiative. Some of these organization and their efforts are as follows-

A. NPTEL

NPTEL stands for National Programme on Technology Enhanced Learning. It is a project funded by MHRD, initiated in 2003. It is a joint initiative of seven Indian Institute of Technology (IITs) and Indian Institute of Science (IISC) for offering courses on engineering and science, initially. Now, NPTEL has started online course in computer science; electrical, mechanical, and ocean engineering; management; humanities, music etc. It offers free course with nominal fees for certification. Anybody from anywhere can join their course. NPTEL portal offering courses is shown in fig. 1.

Fig.1 Home Page of NPTEL online courses.

NPTEL uses the open-source technology for offering courses. The courses are powered by Google's open-source platform *Course Builder* that runs on App Engine and Compute Engine. Also, it offers course content mainly in video lectures prepared in a conventional classroom environment, while some may also use slides to share the content.

Already, NPTEL is the largest single repository of technical courses in the world in the streaming video format and with text meta data for videos, text transcription and subtitling, and possible conversions to all Indian languages. Initially, its courses were having a minimal interactivity and uneven quality, even then the courses ceased to attract a large number of learners. Currently, it is offering more than 1200 courses and is planning to launch 600 more courses on various topics for the period 2016-2020. With the new course, they are looking to

operate like MOOC providers in the market by offerings lectures, assignments and tests.

B. mooKIT

MooKIT is a lightweight MOOC management system built entirely using open-source technologies by Indian Institute of Kanpur (IITK), in 2014. It is a powerful system that can be used to offer online courses at any scale, from micro to massive. It is designed to offer cMOOC (connectivist MOOC). It has been used in 15 courses with about 100,000 registered learners.

It is specially designed to solve the problem of dealing with low-bandwidth and low-computing power situations using existing MOOC platform. To solve the problem, mooKIT provides an indicator (shown in Fig. 2) that shows current bandwidth of the connection, similar to the bars on a mobile phone. It gives a visual indication of bad connection to the learner and they can use other content delivery options that mooKIT provides – for example, stream only audio and play it in sync with the slides, which is often very close to the video experience. If the bandwidth is still low for that even, learner can receive a call on the phone and listen to the audio from there using the calling control provided on the interface (shown in Fig. 2). This feature is very helpful for learners belong to rural areas not having smart phone, laptop, internet connectivity, high bandwidth. They just need a dumb or basic phone. One more special feature of mooKIT is the support of a very powerful analytics interface. Along with the instructor, it also allows the learner to view their course activities, which is not commonly provided in any other platform.

It is built entirely using open-source technologies, and the core engine runs on the MEAN stack that uses java script based technology, making it extremely scalable. It offers four types of solutions [7] based on the requirement-

- **mooKIT Standard**: It is used to run a single course. It does not require local streaming of video, but YouTube videos can be used. Example, mooconmooc.org.

- **mooKIT Enterprise**: It is suitable to run a large number of online courses. Users are a part of a portal and will be able to enroll in the courses they're interested in. Example, mooc4dev.org, and agmoocs.in.

- **mooKIT Replicated:** It is suitable for low bandwidth areas, by allowing the content to be cached on local servers. The serves will sync periodically for updates.

- **mooKIT Personal or Mobi-mooKIT:** It can run on the devices with low computation and low storage capability as of mobile devices. It does not provide forum or social networking due to the device constraint.
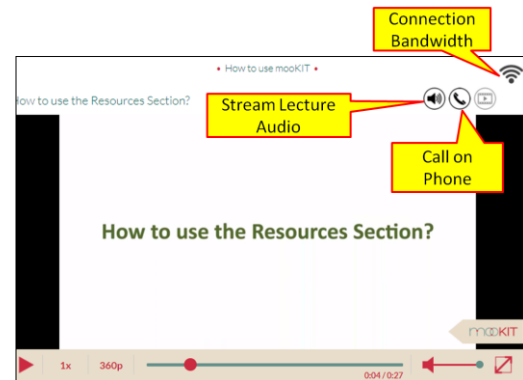

Fig. 2 Video lecture interface of mooKIT showing bandwidth, phone call, audio streaming control.

C. IITBombayX

IITBombayX is a non-profit MOOC platform developed by IIT Bombay using the open-source platform Open edX, in 2014. It was created with funding from National Mission on Education through Information and Communication Technology (NME-ICT), Ministry of Human Resource Development (MHRD), Government of India. Currently, it is offering 63 courses on different subjects from multiple disciplines. Some of the courses provided are as shown in Fig. 3.

Fig. 3. Home Page of IIT BombayX.

IITBombayX is implemented as the basic version of the blended learning MOOC with the help of edX organization. Blended learning is a combination of both face-to-face class room learning and online education methods. This approach is adopted to combine the direct supervision in face-to-face learning and academic freedom with the self paced learning using the online courses. Moreover course completion is not optional but compulsory. This model is named as "Blended Learning - MOOC Model of IIT Bombay (BLMM)". In this system prime universities from India are offering MOOC courses to Indian local college learners.

D. SWAYAM

SWAYAM stands for "Study Webs of Active Learning for Young Aspiring Minds". It is a MOOC platform MOOC launched by the Ministry of Human

Resource Development (MHRD), government of India, to bind online and offline education together. It is started with an expectation of launching 2,000 courses, to make it largest course catalogue, among all provided so far. For SWAYAM an independent platform is developed.

Learners across the country can get credit for MOOC courses offered on SWAYAM, and they can get their credits transferred and recognized at the parent institution, that was not possible in conventional MOOC platforms. In a talk, Dr. Phatak (IITK) mentioned that the mostly the learner drop out from the course as they find the courses either advance or not suitable to help them in scoring good grades in their university exam. Therefore SWAYAM is a right effort of credits using the course that will definitely encourage the learners to complete the course and get their certificate. For SWAYAM, a credit framework has been finalized that would allow the transfer of credits between institutions. An academic institution in India can offer up to 20% of its catalogue in a particular program via SWAYAM.

Currently, SWAYAM offers the courses for school, certificate, diploma, undergraduate, and post graduate. Fig. 4 is showing the home page of SWAYAM portal. The responsibility of delivering courses is assigned to six institutes based on their type, such as NCERT and NIOS for offering school education, IGNOU for out of school learners, CEC for under-graduate education, UGC for post-graduation education, NPTEL for engineering, and IIMB for management studies. Though much of the course content for SWAYAM is the same content that has already been created for NPTEL, which is to be re-purposed for SWAYAM. Also, the content or videos created for this platform will be available on a platform called e-Acharya that already hosts educational video content created by MHRD. So, SWAYAM is promoting the best use of the resources, which is already a very costly affair.
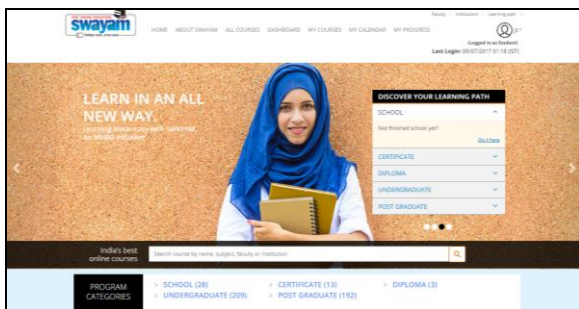

Fig. 4 Home Page of SWAYAM portal

Table I provides a summary of the all platforms discussed in the section with their details.

TABLE I. SOME INDIAN MOOC PLATFORMS AND PROVIDERS

Initiative	Year of Launch	Institution Behind Platform	Website Link
NPTEL	2003	IIT Madras	nptel.ac.in/
mooKIT	2012	IIT Kanpur	www.mookit.co/
IITBX	2014	IIT Bombay	iitbombayx.in/
SWAYAM	2016	MHRD and Microsoft	swayam.gov.in

IV. TECHNOLOGY USED

For offering MOOC, interested institutions have an option to go for self-hosted platforms, or use proprietary platform such as, Coursera, Udacity. When using self-hosted platform, the providers can choose to 1) develop their own MOOC platform as done by IITK by developing moooKIT, or 2) use open-source platform available already.

Indian government always believes in promoting the use of existing open-source platform as their preference. These platforms may require modification and customization as per the needs. Currently, NPTEL and IITBX are live examples of such effort working effortlessly using the open-source technology.

A. Coursebuilder

NPTEL courses are run on *CourseBuilder*, which is an open-source platform created by Google in 2012. It tie together the software and technology Google used to build their Power Searching with Google online course. Anyone can offer their own courses using course builder platform.

The platform provides basic functionality for presenting course material, including learner activities and assessments and instructions for using other Google products to create a course community. It provides basic services such as Google accounts, hangouts, friend circles, which could be used as the social networking feature, if implemented properly. Yet, the platform does not incorporate social networking as such.

Course Builder is built on Google app engine. It is written in Python. It uses the Google app engine for hosting the web application and python for server side scripting. In 2013, Google announced to work with edX as a contributor to the open-source platform, Open edX. Since then, they are only providing maintennace for their previous platform, no futhure enhancement is done from then.

B. Drupal

MooKIT platform is developed using *Drupal,* an open-source Content Management System (CMS). Drupal is used as a back-end system for at least 1.5% of all websites worldwide ranging from personal blogs to corporate, political, and government sites. It is also used for knowledge management and business collaboration.

Drupal base code is written in PHP and it provides the user various Drupal APIs to work with

and implement any feature on their own, or use contributed modules if the feature is already implemented. It is hosted on Apache Web Server as an application. Drupal has a massive support of around 6500 contributed modules which extend features provided by Drupal core.

For developing mooKIT, Drupal is used as the CMS, the core part of the platform, on top of which various other modules and services are defined to allow the user accessing services of Drupal. These modules are written mainly in PHP and Java Script.

C. Open edX

IITBX is powered by the *Open edX* . It is an open-source release of edX platform in 2013. EdX is founded by Harvard university and Massachusetts Institute of Technology (MIT).

Open edX platform is being used by educatioal providers to host their own MOOCs, all over the world. Including MOOC, it can also used to host smaller classes and training modules. Also, educators can extend the platform to build learning tools that precisely meet their needs, and developers can contribute new features to the Open edX platform, due to nature of its availablility as an open-source. Currently, it being used by various ellite universities like, standford, and the organizations such as microsoft, and two indian MOOCs, IITBX and SWAYAM are also on the list. The complete list of its users is available at [8].

Open edX is alomost entirely based on python with Django as the web framework. It is a web-based platform for creating, delivering, and analyzing online courses. It is designed and developed using the modular approach where, "LMS module" allowing learners to access course content such as videos, textbooks, problems; and to check their progress in the course, delivered by the "CMS or Studio module". These modules are designed for instructor to create course structure and add course content, including for learners, also manages the course schedule, course team, set grading policy. Moreover, Open edX allows the users to analyze their course by providing a specific module named "Insight". It supports best and most of the advance features for learners as well as the course providers.

D. SWAYAM

It is being run on an independent platform is created in cooperation with the Microsoft. This platform is laucnhed very recently and is in growing stage, so much of its details are not yet available.

V. FEATURES OF MOOC PLATFORMS

During our study, we carefully analysed the platforms to be familiar with their features. Based on our understanding of studied platform, we have identified certain features of MOOC platform.

MOOC courses have a schedule with staring and end date. Also, there are some self-paced courses that do not have any time restriction to join a course and always available for enrolment. Self-paced courses are only 6% all MOOCs offered [3].

All courses offered traditionally or in an online environment support a learning model. For example, a traditional course supports face-to-face learning, while in online learning as in MOOC, the instructions are delivered in the form of multimedia content. Sometimes, instead of using a single model of instruction delivery, mixed mode approach, also known as blended learning. It brings together online and face-to-face classroom components.

MOOC course is delivered via MOOC platform, which provides some specific feature. For example, for the native users of different origin belonging to various states/ countries, not the content but the platform itself is provided in multiple languages.

Sometimes, the platform used for delivering course is available with its code for everyone, to be used or customized for offering their own MOOCs. So, anyone interested in offering MOOC can use the already existing platforms that are either available for free as open-source or pay for proprietary that are closed platform not available to be repurposed. Indian government have the policy to promote the use of open technologies.

Nowadays, more users are accessing the courses via mobile devices including tablets, smart phone, than ever before. By considering the factor and for ease of the users, providers are offering the mobile applications for their MOOCs. Moreover, these applications can support multiple platforms such as, android and iOS, allowing the learners to use the mobile devices to get enrol, access to course content, and participate in all course activities.

Therefore, we have identified some of the features provided by the MOOC platform, which are as follows-

1) ***Course Format:*** Whether the platform delivers self-paced courses or scheduled course?

2) ***Learning Model:*** Which learning model is supported by the platform, online or blended?

3) ***Number of courses*** a platform is running at present.

4) ***Number of users*** already registered in any course of the platform.

5) ***Institutional Credits:*** Whether other institution provides credit for courses completed on the MOOC platforms.

6) ***Platform Language:*** What are the languages in which the platform is provided?

7) ***Mobile App:*** Do the platform have an App?

8) ***App Platform:*** For which platform, android and/or iOS the app is provided.

The features of the platform are listed in Table II.

TABLE II.   FEATURES OF THE MOOC PLATFORMS

Provider	Course Format	Learning Model	No. of Courses	No. of Users	Institutional Credits	Platform Language	Mobile App	App Platform
NPTEL	Scheduled	Online	1200	1.5 Million	Partial	English	Yes	Android
mooKIT	Scheduled	Blended	15	0.1 Million	Partial	English, Hindi, Kannada, French, Russian, Ukrainian	No	-
IITBX	Scheduled, Self-Pace	Online	63	1.25 Million	Partial	English	No	-
SWAYAM	Scheduled, Self- Pace	Blended	172	Not Known	Yes	Hindi, English	Yes	Android, iOS

VI. COMPARISON OF MOOC PLATFORMS IN INDIA BASED ON WEB ANALYSIS

For comparing the MOOC platforms, data is collected from the web analysis of the sites where the platforms are being run.

Web analytics is the measurement, collection, analysis and reporting of web data for purposes of understanding and optimizing web usage [4]. It not only measures the web traffic but can be used as a tool for business and market research, and to assess and improve the effectiveness of a website. It provides information about the number of visitors to a website and the number of page views. It helps gauge traffic and popularity trends, which is useful for market research.

For the analysis, a tool named SimilarWebPro[1] is used. It allows the analysis of web for the platforms, as well provides the feature for comparing different web sites based on several factors. Here, the data of previous three months from April to June 2017 is used. The tool offers various parameters, from which a few are selected for the analysis of platforms. Here, mainly the parameters are provided for three categories - 1) *Website*, 2) *Website Audience,* and 3) *Traffic Source*. Future, under each category there are some sub-categories providing various measures offering different level of details.

For *Website,* the overall summary is provided that mainly includes the ranking of a site along with a count of number of times site is visited in a period of time. The sites are ranked at three levels, global rank, rank in a particular country, and categorical rank where category are the subject areas such as, career and education, business and industry.

Website Audience covers information about the people who are accessing the sites. It provides information about the traffic, engagement of audiences, and their geographical details. The traffic is analysed with total visits that is sum of all visits in a time period analysed, traffic share providing the percentage of incoming traffic from desktop vs. mobile web, and the ranking. Engagement is also a metric calculated for a specific time period, measuring the number of visits monthly or weekly,

average duration of a visit and bounce rate of site. Also, audiences are geographically mapped based on the hit on a site from a specific country. Here, percentage of traffic for each site coming from top 5 countries is shown, along with the percentage of traffic shared by each country in total.

Traffic Source includes the metrics to inform about the sources traffic is coming from and the channel of this traffic. Here, the traffic mainly comes through Google search, direct, image search, mail, and YouTube, so these are the traffic source of the study. These sources have some type such as direct, mail, referrals (referring a link of website to someone), social, organic/ paid search, and display ads. The information of traffic source is covering the marketing mix, referrals, search, and social. Marketing mix provides share of the website's total incoming traffic from each channel in a specific period of time. Referrals inform about the percentage of traffic share for each website. A search can be organic (basic) or paid, and it is generated from the sources such as, Google, Yahoo, rambler, syndicated, syndicated, ask. Some measures are also offered to analyse the contribution of these searches in overall traffic, in engagement etc. Lastly, the social traffic generated from many sources like, YouTube, Facebook, Reddit, Quora, LinkedIn, is considered to measure the use of social pages/sites in traffic of website.

All measures for the MOOC platforms are listed in Table III. Some observations from the measures of the platforms are discussed as follows-

- In global ranking and country ranking, mooKIT scores highest followed by IITBX, SWAYAM, and NPTEL.

- Based on the number of visits, NPTEL is on top with 9.4 Million visits followed by SWAYAM, IITBX, and mooKIT. It clearly reflects the SWAYAM has gained popularity even if it is launched very recently.

- NPTEL is used more by the desktop users than mobile users and desktop users are even more than double of the mobile users. Whereas the mooKIT scenario is opposite of this having more mobile users. In IITBX and SWAYAM the difference between the desktop and mobile users is not much.

---

[1] https://pro.similarweb.com

- NPTEL have highest number of visits followed by SWAYAM, IITBX, mooKIT. But only mooKIT have unique visits. IITBX is the most engaging platform considering the average duration of the visit, pages/visits, and bounce rate. SWAYAM is second highest engaging considering the same parameters.

- Though, based on the number of visits NPTEL is on top but the count has a fall over the time. SWAYAM has the most increasing visits seen in the last specified period.

- Maximum traffic to these platforms is from India, as these are Indian platforms. US is the second in generating traffic to these platforms.

- NPTEL is the older platform that is also a contributing factor in making it popular in other countries as well. SWAYAM is second, most used platform among all, in other countries, whereas the mooKIT is only being used in India.

- For all platforms, the highest traffic is generated from the organic searches while the direct traffic generation as the second channel in this list.

- MooKIT and IITBX are on top in using the direct channel for traffic generation.

- NPTEL and SWAYAM are most benefited with the organic search in droving the traffic.

- Only, SWAYAM has the increasing traffic whether it is generated from direct channel or the organic searches.

- NPTEL covers maximum share of the traffic coming from the referring websites, followed by SWAYAM.

- In all platform traffic is directed only from the organic searches compared to the paid one.

- SWAYAM and IITBX traffic is generated from the branded keyword that includes brand name and its variation in search terms. Whereas the NPTEL and mooKIT have traffic from non-branded keywords.

- For all of these platforms, most of the traffic is directed from Google search engine.

- NPTEL and IITBX, both have YouTube as the leading social network that droves the traffic to the site. While in SWAYAM, most traffic comes from Facebook.

- NPTEL has an increase in traffic coming from the social pages in past three months.

TABLE III.   VARIOUS MEASURES OF WEB FOR DIFFERENT MOOC PLATFORMS

Category	Sub-Category	Measures	Details	Platforms			
				NPTEL	*mooKIT*	*IITBX*	*SWAYAM*
Website	Ranking	Global	Worldwide	15335	8225204	364373	120800
		Country	India	838	694902	14805	5330
		Categorical	Career & Education	268	NA	NA	NA
	Visits Over Time	Number of Visits	Count	9.4M	4.2M	171.2K	316.7K
Website Audience	Traffic	Total Visits	Count	9.414M	<5K	<5K	316683
		Traffic Share	Desktop (%)	69.51	40.15	22.83	56.73
			Mobile (%)	30.49	59.85	77.17	43.27
	Engagement	Visits	Monthly (Count)	3.183M	<5K	<5K	105561
		Average Visits Duration	Minutes	4:50	2:37	2:09	8:30
		Pages/Visits	Count	3.92	3.73	7.18	8.53
		Bounce Rate	%	46.36	29.72	NA	29.72
	Geography	Traffic share Country wise (Overall) (%)	India (56.46)	93.27	0.02	2.33	4.39
			US (7.36)	99.51	0	0.11	0.38
			UK (2.16)	98.77	0	<0.01	1.22
			Germany (1.7)	99.43	0	0.41	0.17
			Turkey (1.68)	100	0	0	0
Traffic Sources	Marketing Mix	Traffic Share	Direct	1.139M	<5K	42389	40962
			Mail	61020	0	<5K	6142
			Referrals	511483	<5K	25676	48155
			Social	107716	0	<5K	<5K
			Organic Search	4.723M	<5K	21340	81057
			Paid Search	0	0	0	0
			Display Ads	<5K	0	<5K	0
		Average Visit Duration	Direct	00:07:59	00:01:04	00:18:53	00:12:27
			Mail	00:08:37	NA	00:39:35	00:10:49
			Referrals	00:09:24	00:00:16	00:23:32	00:10:04
			Social	00:06:52	NA	00:18:46	00:06:59
			Organic Search	00:04:28	00:00:05	00:17:46	00:09:01
			Paid Search	–	–	–	–
			Display Ads	00:07:58	NA	NA	NA

Category	Metric	Sub				
	Pages/ Visits	Direct	6.03	1.96	12.93	10.03
		Mail	7.00	NA	26.97	9.00
		Referrals	6.02	1.23	13.35	9.61
		Social	4.14	NA	7.18	6.71
		Organic Search	3.76	1.21	12.74	9.35
		Paid Search	–	–	–	–
		Display Ads	8.13	NA	1.00	NA
	Bounce Rate (%)	Direct	33.36	60.00	10.67	25.07
		Mail	36.69	NA	12.50	21.80
		Referrals	37.82	NA	20.92	29.72
		Social	46.37	NA	13.33	40.41
		Organic Search	45.89	66.67	15.14	20.58
		Paid Search	–	–	–	–
		Display Ads	36.36%	NA	NA	NA
Referrals	Traffic Share	Desktop Count	510,000	192	25,000	50,000
		Desktop (%)	87.36	0.03	4.39	8.22
	Top Referrals Traffic Share	%	86.81	0.03	4.61	8.55
Search	Total Visits	Desktop Count	4.7M	641	21.3K	81.1K
		Desktop (%)	97.86	0.01	0.44	1.68
	Service Type (%)	Organic	100	100	100	100
		Paid	0	0	0	0
	Brand (%)	Branded	42.65	0	89.67	91.80
		Non-Branded	57.35	100	10.33	8.20
	Traffic Share	Organic	4.723M	< 5,000	21,340	81,057
		Paid	0	0	0	0
	Average Visit Duration	Organic	00:04:28	00:00:05	00:17:46	00:09:01
		Paid	NA	NA	NA	NA
	Pages/ Visits	Organic	3.76	1.21	12.74	9.35
		Paid	NA	NA	NA	NA
	Bounce Rate (%)	Organic	45.89	66.67	15.14	20.58
		Paid	NA	NA	NA	NA
	Sources (%)	Google	98.59	100	97.78	98.35
		Yahoo	0.68	NA	1.06	0.90
		rambler	0.15	NA	0.59	0.24
		syndicated	0.19	NA	0.10	0.34
		Ask	0.08	NA	0.48	NA
		Others	0.32	NA	<0.01	0.16
Social	Traffic Share	Desktop count	110,000	NA	1,000	3,000
		Desktop %	96.08	NA	0.95	2.98
	Social Networks (%)	YouTube	52.65	0	75.78	27.47
		Facebook	29.12	0	13.60	56.90
		Reddit	10.24	0	0	0
		quora	2.55	0	0	5.26
		LinkedIn	1.82	0	4.89	3.83
		WhatApp webapp	1.13	0	2.87	6.54
		Others	2.49	100	2.86	< 0.01

VII. CHALLENGES FOR MOOC IN INDIA

Some of the major concerns regarding the implementation of MOOCs in India are, the lack of technological infrastructure, investment, diversified population, quality of courses, adoption of MOOC among learners and their acceptance by the academic institutions.

1) *Technological Infrastructure:* MOOC needs the high speed internet connections for accessing the content delivered in their courses. In a developing country like India, Internet and computers comes under luxury and their availability is confined mainly to the urban areas. Limited availability of requisite infrastructure to access MOOCs has confined the extensive spread of MOOCs [9]. India needs to work towards providing a better Internet access for the country's population and provides worldwide connectivity.

2) *Investment:* Offering the MOOC is a costly affair that includes the cost of infrastructure, platforms, content creation, human resources and many more. In India, the institutions do not have many capitals to invest in such event so it is not easy for an individual institution to offer such services. There is need of involvement from some authorities, who can invest in the process to support the education. Even Indian government needs to liberalize conventional

regulations and restrictions and encourage public private partnership for creating MOOCs in this country [10].

3) *Diversified Needs*: India is a widely diversified country having multicultural societies and different languages spoken. For acceptance of MOOC among the huge domain of audience, they need to agree upon a common language of speaking. English as this language accepted globally, again throws away a considerable amount of audience who do not possess the knowledge or adequate fluency in English [9]. So, a switch over to mostly English based courses as offered via current MOOCs often discourages learner to continue their courses.

The courses should also be offered in some regional languages, which may be a tedious task and prone to loss of uniformity and quality. Therefore, language is one of the barriers for learners from Indian origin that need to be addressed by the MOOC providers in a more realistic way. Moreover, the challenge is to deliver the lecture, designing of the course material, and the platform itself, in a way that can be understood by all. Hence forth, the main motive should be to work in the direction which can minimize the existing differences amongst the learners [10].

4) *Adoption of MOOC among learners:* Generally in MOOC courses the communication between a teacher and learner and among learner as well is in written form. It results in the lack of oral communication skills among the learners and to improve this they need undergo a traditional program. Also, watching the course videos of other content on a computer screen can make the learner feel isolated. Due to this, motivation of learner falls resulting in dropping out from the course. Moreover, the courses that require lab or hands-on training may not fulfill the purpose completely in online mode [10]. Therefore, the challenge faced by MOOC could be adoption of technology by learners.

5) *Quality:* To create and deliver quality content in MOOC, quality of teachers and technical staff is required. India has huge vacancies of teachers not filled, compounded by infrastructure deficit as the absence of laboratories. Also, it may be possible that teachers are not technically sound to create course content using the tools.

Emerging initiatives internationally and nationally are working towards offering quality educational by providing their content as open resources, but some of them are constraint by the adoption policies of their country or organization. India should also need to leverage these initiatives as a readily available, economically viable source of quality content

for adoption [11]. Also, a national quality assessment framework to assess the quality and adoption of new approaches like, credit transfer, MOOC, integrated courses etc., should be adopted along with teacher training, their performance related appraisal and midterm re-evaluation [12].

Thus a complete revamp is needed to meet the present demand and address the challenges that India is facing in offering MOOCs.

VIII. ISSUES ADDRESSED BY SWAYAM

Education is the foremost sector that shoulders the biggest responsibility of shaping the future of any nation. India is presently facing multiple challenges in offering education through MOOCs. India has started their own MOOC as SWAYAM, an effort of the government in making the education accessible for all irrespective of any factor such as, their educational qualification, geographical disparity. There are several issues in delivering MOOC, as discussed in previous section. Some of these issues addressed by SWAYAM are:

1) *Technological Infrastructure:* Before launch of SWAYAM, it was clear that as a provider they need the technical infrastructure, for two primary areas; a) access and delivery, b) course content creation. For the access to the network, connections across the institutions/schools and a backbone providing the advanced capabilities has started as a national initiative by the government. Also, some local authorities like gram panchayats, has been involved in making it possible to provide the network connectivity in their areas.

Moreover, to create course content, government is investing by partnering with the institutions (IITs,IIMs, IISC, UGC), which are competent in a specific area of education. Also, for the time being until the connectivity reach to each school or college, some local centres are established to train the instructors or teachers for using the platform.

2) *Investment:* SWAYAM is a fully government funded project that covers cost of everything such as, content creation, technical infrastructure, maintenance, human resources. For technical support the government has signed a deal of 38 crore with Microsoft [13]. According to a report published by UGC, the fund has been allotted to all the contributing institutes of SWAYAM for fasten the process of delivering the targeted courses.

3) *Diversified Needs*: To satisfy the diversified needs of the Indian learners, firstly the platform is available in both, English as well as Hindi language. It will surely minimize the language barrier for the learners.

4) Adoption of MOOC among learners: Since SWAYAM supports the blended learning where after learning from the online courses the learner will also go to their college/institute. The learner will experience face-to-face learning along with the online learning. So, the lack of oral communication is not the problem anymore. Also, due to inclusion of traditional learning, chances of feeling cut off or alone is reduced. Learner will definitely avail all the benefits of a traditional learning environment such as, lab access, hand-on experiments.

The course credits obtained from a SWAYAM course will be considered by the institutions. According to new UGC guidelines, 20% course credits will be generated from the MOOCs offered on SWAYAM. It will surely help in improving the adoption of courses among the learners.

5) Quality: For technical expertise the government has already hired Microsoft. Furthermore, to enhance the expertise of the teacher or instructors in using the courses offered by SWAYAM, some training programs, workshops are being done all over India at the regional and local centers created for the purpose. These programs are organized by the top institutions that are contributors of SWAYAM such as, IITs, IIMs, and central universities etc. The focus of these programs is to produce more qualified and technically sound faculties to deliver quality education to the learner. Also, these faculties will be able to solve problems of their learners who belong to the same institution as of faculty.

Furthermore, to ensure fare credits and stop the plagiarism or cheating in the exam examination, these exams will be held in some designated local center, where the supervisors will be assigned from the coordinating universities/institutes to conduct the exam smoothly with the quality.

IX. CONCLUSION

MOOC platforms are being used globally for offering online course and India is no exception. There are various MOOC platforms that are being used in India for offering the courses, such as, NPTEL, mooKIT, IITBX, and SWAYAM. Except the NPTEL, these are the new platforms having history of hardly 4 to 5 years, while SWAYAM is launched very recently. Therefore, to set up a ground for understanding including theoretical as well as technical aspects, a discussion is provided about each of these platforms with their features. Also, while using these platforms it is needed to understand their current state, popularity among learners, use of social media for referring, searched etc, and several other parameters or features. For the purpose a comparative analysis is provided for these platforms using web analysis considering several parameters as mentioned. Furthermore, there are some issues that are faced while implementing MOOC in India. These challenges are mentioned here. Some of these issues are already addressed by SWAYAM, which is the most recent platform.

REFERENCES

[1] Shah, D. (2016, Dec 25). By The Numbers: MOOCS in 2016, How has the MOOC space grown this year? Get the facts, figures, and pie charts, https://www.class-central.com/report/mooc-stats-2016/

[2] Pandey, N. (2016, Jul 14). Open online course providers upbeat as enrolments jump. http://www.thehindubusinessline.com/news/education/open-online-course-providers-upbeat-as-enrolments-jump/article8850328.ece

[3] Shah, D. (2016, Jul 8). MOOC Tracker – Never Miss a Course, Notification/Reminder service for MOOCs, Class Central. Accessed from https://www.class-central.com/report/mooc-tracker

[4] Clifton, B. (2012). *Advanced web metrics with Google Analytics*. John Wiley & Sons.

[5] Damodharan, D. (2016, Jul 15). India Represents The Second Highest Enrolments in Our Courses': EdX CEO Anant Agarwal, Blog. http://www.huffingtonpost.in/dipin-damodharan/our-mission-is-to-democra_b_8607538.html

[6] Aspiring Minds (2016), National Employability Report 2016 - Aspiring Minds, Annual Report.

[7] MooKIT, http://www.mookit.co/

[8] Miller, A. (2017). Sites powered by Open edX , Accessed from : https://github.com/edx/edx-platform/wiki/Sites-powered-by-Open-edX

[9] Chatterjee, P., & Nath, A. (2014, Dec). Massive open online courses (MOOCs) in education—A case study in Indian context and vision to ubiquitous learning. In *MOOC, Innovation and Technology in Education (MITE), 2014 IEEE International Conference on* (pp. 36-41). IEEE.

[10] Garg, D. (2017, Feb). Major Challenges in online Higher Educational Environment. http://blogs.timesofindia.indiatimes.com/breaking-shackles/major-challenges-in-online-higher-educational-environment/

[11] Sethi, K. K., Bhanodia, P., Mishra, D. K., Badjatya, M., & Gujar, C. P. (2016). Challenges Faced in Deployment of e-Learning Models in India. In *Proceedings of the International Congress on Information and Communication Technology* (pp. 647-655). Springer Singapore.

[12] Insights. (2015). Critically comment on the major challenges facing higher education in India and measures needed to overcome them. Economic Times, News Article. Accessed from : http://www.insightsonindia.com/2015/08/11/5-critically-comment-on-the-major-challenges-facing-higher-education-in-india-and-measures-needed-to-overcome-them/

[13] Mukul,A. (2016, Jun 17). Microsoft to design app for Indian govt's open online courses. Economic Times, News Article Accessed from: http://tech.economictimes.indiatimes.com/news/internet/microsoft-to-design-app-for-indian-govts-open-online-courses/52790346