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Private EdTech Companies in India: *The Techno-Financial Aspects*

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ABSTRACT

Education sectors are one of the growing sectors in India. The implementation of various basic and emerging technologies in the education sector has led to rapid changes in the education system. With the use of technology, the education system has now changed from traditional classroom based education to digital education. Various private companies have established their businesses in the education sector. With the adoption of various technologies like Artificial Intelligence, Cloud Computing, Bigdata Analytics and so on, the EdTech companies are growing rapidly. The EdTech companies have setup Digital Education infrastructure for the scientific delivery of education to the learners. The EdTech companies have tried to synthesize different areas like- Education, Technology, Pedagogy, Business, Economics, Finance, Politics and many more. The intelligent system of learning with scientific based personalize study material and special doubt clearance have considered to make the relationship between curriculum, syllabus and pedagogy. This paper discusses about the private EdTech companies in India. This paper discusses the financial aspects of these private EdTech companies. Different basic and emerging Technologies used by the private EdTech companies have also discussed in this paper.

HIGHLIGHTS

⊙ Overview of EdTech.
⊙ EdTech companies in India.
⊙ Different Technologies used by EdTech companies and which are emerging rapidly.
⊙ Financial challenges of EdTech companies.

Keywords: EdTech Company, Basic Technology, Emerging Technology, financial aspects

Education is very important for a country's growth. Investment in education means the investment in human resource. It is very much necessary for a country to educate the people. With the advancement of Technology, education sector have also changed rapidly. Parallel with the traditional face to face mode on campus based education, it has seen that digital education also plays a vital role. Various types of basic and emerging Technologies have used in Digital education. The application of Technology in education sector can be considered as education Technology which is simply called EdTech. It has been noticed that many private companies are continuously investing in education sector. They have established different type of EdTech companies to serve different type of courses to the learner. The Government of India also take some initiative in EdTech. Private EdTech companies

are also expanding their businesses in India parallel with the globe. Different EdTech companies have offered various courses and program in different modes. The courses are available in internet based online mode as well as face to face based on campus physical mode. The students get more benefits with the use of technology in education. The students get the flexibility in learning. They can read anything as they wish from anywhere at any time. The main focus of the EdTech companies how to give the technology based education for the easy understanding of the student with very less amount of cost.

Objectives

EdTech is an important for the advancement education system. It is very helpful for the students to get different kind of courses and program. The objectives of this paper are —

- To give the overview of EdTech.
- To discuss the review of literature and previous works with the similar context.
- To study the EdTech companies in India.
- To learn about the different Technological and Financial aspect.
- To discuss the different Technological and Financial challenges of the EdTech companies.

Methodology used

The work entitled 'Private EdTech Companies in India: The Techno Financial Aspect' is a theoretical chapter and it is interdisciplinary in nature. Various secondary sources are used from different areas and subjects viz. Education, e-Learning, Technologies, Finance that are used in EdTech companies are studied to complete this work.

Review of Literature

To analyze The Techno Financial Aspect of Private EdTech Companies in India, it is necessary to study the previous works related to this context. Different research work have done in this similar context. Therefore to review of literature in similar topic is discussed below-

Ameer & Vineeth, (2021) have done a Multidimensional Analysis on different Ed Tech Industries in India to find the impact of Covid-19 Pandemic on this EdTech Industry. It saw an unprecedented 26% increase in user visits and leading EdTech companies claimed a 100% month-on-month increase in paying users and a 50% increase in traffic during Covid-19. It considers the K-12 and higher education landscape from the perspective of the student enrollment, sharing of network traffic, incorporation of new products, revenue generation, accessibility and affordability and others parameters. It noticed that the certain changes of Ed Tech Companies during Covid – 19 pandemic.

Anugerah & Retnowardhani, (2022) tried to measure the Student Satisfaction in using Learning Management System At ED-TECH Company. It used the IS Success Model to find the direct impact from information quality on user satisfaction related to technical system quality, service quality, educational system quality through learning management system. As a sample, it considered 70 students in an ed-tech company in Indonesia who have already used the learning management system in that company for at least 1 month for their studies. It analyzed the results and discovered that perceived usefulness and technical system quality significantly influence user satisfaction.

Davies *et al.* (2022) Investigated to find various financial power brokers behind the EdTech companies. It investigated some Ed Tech companies present over the globe. It featured GSV Ventures and Owl Ventures as EdTech specific investors with international investments. It highlights the way EdTech unicorns have invested in the education sector.

Dutta, (2022) analyzed EdTech companies with a business analytics perspective. It shown the growth in the use of Digitization in learning and teaching process in India. It described the role of Business analyst for any EdTech companies. It also showed the process that it could use Porter's 5-forces analysis to determine competitive position. To ensure consistency, Business analysts played an important role in EdTech organizations to familiarize to continuous changes.

Gupta & Warkhedkar, (2022) made a study on the impact of EdTech companies on education. It used byjus and vedantu as special reference. An attempt was made to identify the impact of various EdTech

companies on education. It has been studied positive and negative side of the EdTech organizations- like Vedantu and Byjus. It also studied the efficacy of EdTech start up on education.

Igorevic, (2021) made a resource-based approach to developing strategies for the entry of EdTech companies into emerging markets. It discussed the concept of EdTech industry in developed and emerging markets. It shown the Global Education growth from 2019 to 2025. It discussed various types of resources that the organizations have. It has researched on various EdTech companies in developed and developing countries on Prism of resources which is based on theoretical framework. It did a comparative analysis of EdTech companies in developed and developing countries.

Jain *et al.* (2021) analyzed the Teachers' opinion on impact COVID-19 in schools education. EdTech companies bring an opportunity for students and grown their business faster while teachers are less familiar with online based teaching - learning process during the pandemic. It presented the different difficulties faced by the teachers during pandemic. It also discussed the role of EdTech companies to provide the services to fulfil the pedagogical gaps of the learners during the pandemic time.

Mishra, (2023) worked on the school education in India at the time of Codiv-19 period. It proposed critical spatial and 'meritocratic' appraisal on various emerging EdTech organizations. It analyze the education system with socio-economic perspective. It made an online education experience survey on 10-18 years old school students. It followed cluster random sampling survey for the data collection. It has developed a hypothesis and tested. It studied the socio-economic associations of online education in India.

Rajan, (2022) analyzed one of India's most valuable education technology companies. It considers some unusual cases of BYJU's as one of the growing EdTech Company from India. It made a case study on the BYJU's to show the critical elements of the company's journey. It has included the role of the student team who helped to build the huge business. It analyzed the product development process and various challenges regarding the sell. It gave the effort on marketing and continuous

acquisitions of key elements that helped in boosting the growth of the organization.

Sharma, (2022) worked on to find From 'Determinism' to 'Solutionism'. It attempted to map the global EdTech revolution during the pandemic. It defined the Education Technologies used in Higher education. It focused on Human Capital Theory. It found various Interferences in teaching and learning in higher education. It shown some of the most popular EdTech Companies model and discussed on crisis management.

Sharma, (2020) analyzed the impact on the online education sector and EdTech companies faced during COVID-19 period. It studied different kind of e-learning and the management of the crisis periods. It deals with the potential, limits, incentives and challenges of online learning. It tried to showcase the development of the EdTech Companies during pandemic periods. It suggested ways for college teachers to address the challenges of online learning.

Sikandar & Rahman, (2021) analyzed the EdTech Start-ups companies in India. It studied the education ecosystem in the post Covid-19 period in India. It discussed different digital facilities provided to the education sector by the Government of India. It assessed the factors in the changing nature of the education ecosystem due to the unexpected impetus for EdTech start-ups in India. It discussed the possible development, Scope and Sustainability of EdTech Start-ups in India.

EdTech: Overview

EdTech is a concept that is combination of two words- one is education and another is Technology. EdTech is the implementation of technology in educational field. It is used for the easy understanding of any concept by the learner and enhance the learning outcome. Various basic and emerging Technologies are implementingin Technology based learning. Traditional campus oriented face to face mode of education is also benefited by the utilization of digital education in traditional education system (Chatterjee, R. *et al.* 2023). To implement EdTech in education system, it is necessary to established appropriate infrastructure (Paul, Ghose, & Chaterjee, 2012). It requires hardware, software, network technologies, database technologies,

web technologies, multimedia Technologies, communication technologies and many more. EdTech help the learner to enroll at anything course or program as their choice. It provides the facility to learn anything from anywhere at any time. By the use of learning management system, e-Learning Technologies, adaptive learning concept, various educational based apps or applications, Open Educational Resources (OER), remote learning tools, online meeting applications, educational gaming, Artificial Intelligence, Virtual Reality, Augmented Reality, Bigdata Analytics, Cyber Security, Blockchain Technologies, Cloud Computing and so on, the EdTech are growing rapidly (Paul, *et al.* 2019 & Paul & Jena, 2023). Fig. 1 shows the concept of EdTech.
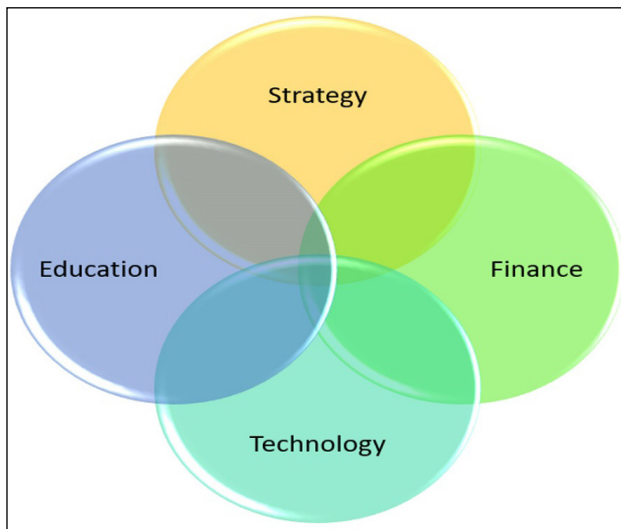

Fig. 1: Basic concept of EdTech at a glance

EdTech companies in India

The education system has changed by the use of Technology. It has been noticed that the EdTech based learning get more popular during and after the covid-19 period. The EdTech companies got boost and flourished their businesses during the covid-19 period. During and after this period many new EdTech companies have also been established in India. It has been noticed that many new collaboration between institutions has also taken place during this period (Paul, 2019). EdTech companies have grown significantly with the use of various basic technologies, emerging technologies and adoption of new business strategies by the companies. The learners get the benefit most. The learners gets the choice to enroll themselves any courses or programs as the wish. The learner get the facility to learn any new concept easily with the use of digital education system. The learners gets the flexibility to read at any time and from any geographical domain. The EdTech companies in India, play the vital role in education system. They help to build the competitive mentality among the students. They provide the facility to the learner to attend the class in online mode with the use of internet or the learner may attend the class in face to face based physical mode (Paul 2020). Fig. 2 shows some logos of some EdTech Companies in India.

Fig. 2: Logos of some EdTech Companies in India

Some EdTech companies have played a vital role in the preparation of competitive examinations. Candidates are seeking for the jobs so they are interested to get the coaching for the preparation of jobs. In India, there is a craze among the candidate to get government job to secure their future. Therefore they are mainly the focus user for the EdTech companies. Khan Global Studies, Khan Global Studies Pvt. Ltd. 5th Floor, A13A, Graphix 1 Tower B, Sector 62, Noida, Uttar Pradesh, India- 201309 is the example of an EdTech company which focus on the various kind of competitive examinations specially UPSC examination and other government jobs. Some of the EdTech companies are also focuses on the entrance examination like joint entrance examination for the admission in various engineering courses in difference States, JEE (Advance) for admission in various Indian Institute of Technologies (IITs), medical entrance test, like- National Eligibility cum Entrance Test (NEET), Entrance Test for Post Graduate degree in medical - National Eligibility cum Entrance Test for Post Graduate (NEET PG), National Eligibility cum Entrance Test for MDS (NEET MDS), All

India Institute of Medical Sciences Nursing (AIIMS Nursing), Indian Army BSc Nursing, National Eligibility cum Entrance Test Super Specialty (NEET SS), Foreign Medical Graduates Examination (FMGE), Institute of National Importance Combined Entrance Test (INI CET), Joint Entrance Test for Nursing, Paramedical and Allied Sciences Under Graduate (jenpas-ug), Joint Entrance Test for ANM(R) & GNM Courses and many more. Akash - Byjus is an example of an EdTech company that mainly focuses on entrance exams for post-higher secondary exams. Some EdTech companies are offer the facility to get the only study material of courses. Even Some EdTech companies are also offer the facility to get the only the examination on model question sets for their school board examination or school examination preparation. Some EdTech companies in India are shows in table 1.

Technological and Financial Aspect

Technology and Financial support are two important pillars of any EdTech company. To establish any EdTech company, it should have proper infrastructural support. The growth of the company is dependent on the technology uses by the company, business strategy and a strong economic and financial support. Different Technologies used by the EdTech companies and the financial planning and support are discussed below.

Technological Aspects

Technologies have played an important role for the smooth add efficient execution of the organization. Various basic Technologies and emerging Technologies are the key factors to give better services by any EdTech company. Information Technology (IT) and Information and

Table 1: Some EdTech companies in India

Sl. No.	Company Name	Founded in	Employees in India	Headquarters	Website
1	Aakash Educational Services	1988	10k-50k	New Delhi, Delhi, India	www.aakash.ac.in
2	AAFT	1993	501-1k	Noida, Uttar Pradesh, India	www.aaft.com
3	ABSAS Solutions	2009	51-200	Noida, India	www.absas.net
4	Acadecraft	2011	201-500	Noida, Uttar Pradesh, India	www.acadecraft.com
5	AccioJob	2018	51-200	Gurgaon, Haryana, India	www.acciojob.com
6	Adda 247	2016	51-200	Gurgaon, Haryana, India	www.adda247.com
7	AstraGen	2012	201-500	Chennai, Tamil Nadu, India	www.astragen.in
8	Baoiam Innovations	2021	11- 50	New Delhi, Delhi, India	www.baoiam.com
9	BridgeLabz Solutions	2016	201-500	Mumbai, Maharashtra, India	www.bridgelabz.com
10	BrightCHAMPS	2020	501-1k	Bangalore, Karnataka, India	www.brightchamps.com
11	BYJU'S	2011	1k-5k	Bangalore, Karnataka, India	www.byjus.com
12	BYJU'S Exam Prep	2015	501-1k	Noida, Uttar Pradesh, India	www.byjusexamprep.com
13	Camp K-12	2010	51-200	Gurgaon, Haryana, India	www.campk12.com
14	Coding Ninjas	2016	51-200	New Delhi, India	www.codingninjas.com
15	Collegedunia	2014	1k-5k	Gurgaon, Haryana, India	www.collegedunia.com
16	CRB Tech Solution	2001	501-1k	Pune, Maharashtra, India	www.crbtech.in
17	Cuemath	2013	1k-5k	Bangalore, Karnataka, India	www.cuemath.com
18	DataTrained	2012	51-200	Bangalore, Karnataka, India	www.datatrained.com
19	Doubtnut	2016	201-500	Gurgaon, Haryana, India	www.doubtnut.com
20	EbixSmartclass Educational Services	2014	501-1k	Gurugram, India	www.smartlearning.com
21	eBIZ.com	2001	51-200	Noida, Uttar Pradesh, India	www.ebizel.com
22	Educational Initiatives	2001	201-500	Ahmedabad, Gujarat, India	www.ei.study
23	Educomp Solutions	1994	11-50	Gurgaon, Haryana, India	www.educomp.com
24	Edunext Technologies	2012	201-500	Noida, Uttar Pradesh, India	www.edunexttechnologies.com
25	Edureka	2011	501-1k	Bangalore, Karnataka, India	www.edureka.co
26	Ekeeda	2016	51-200	Mumbai, Maharashtra, India	www.ekeeda.com
27	Embibe	2012	1k-5k	Bangalore, Karnataka, India	www.embibe.com

28	EntabInfotech	2001	501-1k	Delhi/NCR, New Delh, India	www.entab.in
29	eSense Learning	2008	201-500	Mumbai, Maharashtra, India	www.esense.in
30	Evelyn Learning Systems	2013	201-500	Delhi/NCR, NewDelhi, India	www.evelynlearning.com
31	Exotic Learning	2020	51-200	Lucknow, Uttar Pradesh, India	www.exoticlearning.in
32	Extramarks Education	2007	1k-5k	Noida, Uttar Pradesh, India	www.extramarks.com
33	FastInfo	2019	501-1k	Kolkata, West Bengal, India	www.fastinfo.com
34	FOCUS EDUMATICS	1999	5k-10k	Bangalore, Karnataka, India	www.focusedumatics.com
35	G-Cube Solutions	2000	201-500	Noida, India	www.gc-solutions.net
36	Global Opportunities	2001	51-200	Delhi/NCR, Delhi, India	www.global-opportunities.net
37	Great Champ Technology Limited	2010	501-1k	Noida, Uttar Pradesh, India	www.greatchamp.in
38	Great Learning	2013	1k-5k	Gurgaon, Haryana, India	www.greatlearning.in
39	Henry Harvin Education	2015	51-200	Noida, Uttar Pradesh, India	www.henryharvin.com
40	Hike Education Private Limited	2014	201-500	New Delhi, Delhi, India	www.hikeedu.in
41	Home-revise Education	2002	201-500	Thane, Maharashtra, India	www.homerevise.co.in
42	IFAS Edutech Private Limited	2002	201-500	Pune, Maharashtra, India	www.ifasonline.com
43	Imarticus Learning	2012	501-1k	Mumbai, Maharashtra, India	www.imarticus.org
44	IndiaCan	2008	201-500	Noida, Uttar Pradesh, India	www.in.pearson.com
45	Infinity Learn	2021	501-1k	Hyderabad, Telangana, India	www.infinitylearn.com
46	Intellipaat Software Solutions	2011	201-500	Jaipur, India	www.intellipaat.com
47	iNurture Education Solutions	2005	501-1k	Bangalore, Karnataka, India	www.inurture.co.in
48	Jamboree Education	1993	201-500	Delhi, India	www.jamboreeIndia.com
49	Jaro Education	2009	501-1k	Mumbai, Maharashtra, India	www.jaroeducation.com
50	JetkingInfotrain	1947	51-200	Mumbai, Maharashtra, India	www.jetking.com
51	K12 Techno Services	2010	1k-5k	Bangalore, Karnataka, India	www.k12technoservices.com
52	KC Overseas Education	1998	501-1k	Nagpur, Maharashtra, India	www.studies-overseas.com
53	Kidzee	2003	1k-5k	Ernakulam, Kerala, India	www.kidzee.com
54	LEAD School	2013	1k-5k	Mumbai, Maharashtra, India	www.leadschool.in
55	Learning Routes	2017	201-500	Gurgaon, Haryana, India	www.learningroutes.in
56	LearningMate Solutions	2001	1k-5k	Mumbai, Maharashtra, India	www.learningmate.com
57	Leverage Edu	2017	51-200	Delhi, NCT, India	www.leverageedu.com
58	Lido Learning	2019	201-500	Mumbai, Maharashtra, India	www.lidolearning.com
59	Little Millennium	2008	51-200	Gurgaon, Haryana, India	www.littlemillennium.com
60	MASAI School	2019	201-500	Bangalore, Karnataka, India	www.masaischool.com
61	MENTORS EDUSERV	2012	201-500	Patna, Bihar, India	www.mentorsedu.com
62	Mentorsity	2020	11--50	New Delhi, Delhi, India	www.mentorsity.com
63	MeritNation	1988	51-200	Delhi, NCT, India	www.meritnation.com
64	MeritTrac	2000	201-500	Bangalore, Karnataka, India	www.merittrac.com
65	Nerdy Turtlez	2009	201-500	Noida, Uttar Pradesh, India	www.NerdyTurtlez.com
66	Next Education India	2007	1k-5k	Hyderabad/Secunderabad, Telangana, India	www.nexteducation.in
67	NxtWave	2020	1k-5k	Hyderabad, Telangana, India	www.ccbp.in
68	Oda Class	2017	1k-5k	Bangalore, Karnataka, India	www.odaclass.com
69	Orion Edutech	2006	5k-10k	Kolkata, India	www.orionedutech.com
70	Physicswallah	2019	10k-50k	Noida, Uttar Pradesh, India	www.pw.live
71	Planet Spark	2017	51-200	Gurgaon, Haryana, India	www.planetspark.in
72	PrepLadder	2015	501-1k	Panchkula, Haryana, India	www.prepladder.com
73	Resonance Eduventures	2001	51-200	Kota, Rajasthan, India	www.resonance.ac.in

74	Rubicon Skill Development	2017	51-200	Pune, Maharashtra, India	www.my-rubicon.com
75	Scaler Academy	2019	1k-5k	Bangalore, Karnataka, India	www.scaler.com
76	Schoolnet India	1997	51-200	Noida, Uttar Pradesh, India	www.schoolnetindia.com
77	Simplilearn	2010	1k-5k	Bangalore, Karnataka, India	www.simplilearn.com
78	SkillVertex	2021	201-500	Bangalore, Karnataka, India	www.skillvertex.in
79	Smart School Education	2011	11-50	Noida, India	www.smartschoolonline.in
80	TALENTEDGE	2012	201-500	Mumbai, Maharashtra, India	www.talentedge.com
81	TalentSprint	2008	201-500	Hyderabad, India	www.talentsprint.com
82	Tata ClassEdge	2011	501-1k	Mumbai, Maharashtra, India	www.tataclassedge.com
83	TC Global	1995	201-500	Delhi, India	www.tcglobal.com
84	Teachmint	2020	501-1k	Bangalore, Karnataka, India	www.teachmint.com
85	Techno India Group	1985	51-200	Kolkata, West Bengal, India	www.technoindiagroup.com
86	Testbook.com	2014	501-1k	Mumbai, Maharashtra, India	www.testbook.com
87	Toppr	2013	1k-5k	Mumbai, Maharashtra, India	www.toppr.com
88	Toppscholars	2019	201-500	Mumbai, India	www.toppscholars.com
89	Trivium Education Services	2010	51-200	Delhi/NCR, Delhi, India	www.triviumedu.com
90	Turito	2018	201-500	Hyderabad, Telangana, India	www.turito.com
91	Unacademy	2015	1k-5k	Bangalore, Karnataka, India	www.unacademy.com
92	Unschool Learning	2019	1k-5k	Hyderabad, Telangana, India	www.unschool.in
93	Urbanpro	2011	51-200	Bangalore, Karnataka, India	www.urbanpro.com
94	Valued Epistemics	2008	11-50	Chennai, Tamil Nadu, India	www.valuedepistemics.com
95	Vedantu	2011	1k-5k	Bangalore, Karnataka, India	www.vedantu.com
96	Verzeo	2018	11-50	Bangalore, Karnataka, India	www.verzeo.in
97	VidyaMandir Classes	1989	1-10	New Delhi, India	www.vidyamandir.com
98	Virohan	2015	501-1k	Gurgaon, Haryana, India	www.virohan.com
99	Whitehatjr	2018	5k-10k	Mumbai, Maharashtra, India	www.whitehatjr.com
100	WizKlub	2018	11-50	Bangalore, Karnataka, India	www.wizklub.com

Source: https://www.ambitionbox.com

Communication Technology (ICT) have used to implement a strong technological infrastructure by the companies (Paul, Dangwal, & Chaterjee, 2012). Database Technologies, web technologies, network technologies and software technologies are utilized to building the system. The strong and stable network connectivity the most essential part of the EdTech companies. To give any services globally, it is essential to ensure uninterrupted services to the user. Various emerging Technologies like Cloud Computing, Bigdata Analytics, Artificial Intelligence and machine learning, IoT, blockchain Technologies, Virtual Reality, Augmented Reality and so on are responsible for efficient and effective services to the user (Chatterjee, 2023). The Cloud Computing Technologies are helping in virtualization of the system and plays an important role to reduce the cost and increase the data protection. Efficient Data Analytics help to understand learners' choice. Bigdata Analytics Technology analyze the data and try to find the meaningful conclusion and predict the learner score and behavior of them. Artificial Intelligence and machine learning at the two modern technologies which are helping to analyze the customer behavior (Jaiswal & Arun, 2021). IoT devices are helpful in various sensor based activities. Block chain Technologies are useful to protect the system from unauthorized modification of data secure the system. Virtual Reality Technologies are futuristic Technology could be used by the EdTech companies to provide the student virtual learning environment and attract them to get their services. Virtual Reality will help the student to get the thrill in learning. The student will get the classroom visibility with 360 degree vision. The EdTech companies are also experimenting on the Augmented Reality Technologies. Augmented Reality Technologies are very helpful to get the virtual learning experience in real time scenario. It helps to explain any concept easily to the learners. It also attract the learner, create curiosity about lessons, grown interest in learning, and create a joyful learning environment.

Different Technologies are used to create various products and services for the user by the Ed Tech companies. All the services provided by this Ed tech companies are completely dependent on Technologies. Therefore to give better services to the user, it is necessary to have a team with strong and sound knowledge in Technology. Learning management system (LMS) help the learner to manage we are learning progress. It helps the learner to choose their courses and program and help to study according to their need with doubt clearance facility. Learning management system is a one stop solution to all the need of the learner. The learner can access this system from anywhere at any time with or without the use of internet. Moodle, Blackboard, Canvas, and Google Classroom are some examples of online course management system.

EdTech Companies are trying to build an e-learning platform with the help of different Technologies. The e learning platforms are very helpful for the learner that provide various facilities like online best learning, flexibility in learning, digital education, interactive learning, multimedia based learning material, video recorded lectures, quiz, assignments and so on. Adaptive learning platforms are another facility that provides customize learning material for the learner. The learners get the benefit to get personalized and customized learning material. It tried to find different learning difficulties of the learners. E-Books and digital content are also played very important role for the easy understanding of any concept by the student. The EdTech Companies are trying to develop different mobile based applications. The mobile applications are very useful for the learners. It provides the facility to access the learning management system on their fingertip. The mobile applications are very user friendly an easy to access by the user. It covers different subjects, different courses, different programs, different classes, different studies, and different age groups and so on. The EdTech companies are also develop various educational gaming apps and educational entertainment apps or applications. This applications are very useful for the little learner. The children are very much interested with this applications. The applications are mainly have rhymes, counting of numbers, multiplication tables, animal identification, food and flower identification,

alphabet identification and many more features. This applications turn very attractive for the for the little learners because it consists of music, bright colours, easy to use, interactive and so on.

Various analytics tools are very useful for the continuous analysis of the system. It is mainly helpful for the proper identification of the learner's need and learners difficulties. It also associated with learning Analytics. Different learning Analytics tools are continuously analysis the student performance. It has the power to predict the tentative score of the learner. EdTech companies are also focus on the digital-based assessment. Its offer various types of questions for the assessment like — Multiple Choice Question (MCQ), Short Answer Questions (SAQ), essay type question, matching, fill in the blanks etc. EdTech companies are also focus on the digital education. It uses various Technology based devices in physical mode face to face classes. It offers smart classrooms, interactive white board, projectors, live streaming of the classes and so on to the learners. The EdTech companies are also focused on the continuous development of the teachers. It creates special tool for the teacher that helps the teacher to deliver their class easily. It provides the continuous professional development programme to the teachers. EdTech companies are using various Technology to improve their business models. It has a separate team for the continuous research and development (R&D). Innovations are one of the key factors for this company which helps the direct growth of the companies. EdTech companies are using various graphically represented management information system (MIS) software that helps the management to take business strategic decisions.

Table 2: Market Value of Technologies in Education

Technology in Education	Year	Market Value in USD
Artificial Intelligence	2018	2.5 Bn
	2023	3.68 Bn
Internet of Things	2018	4.8 Bn
	2023	11.3 Bn
Cloud Computing	2016	8.13 Bn
	2021	25.36 Bn
Gamification	2018	0.45 Mn
	2023	1.8 Mn

Data Source: https://appinventiv.com/blog/technologies-for-EdTech-business-next-level/

Table 2 presents current scenario of the technology market in education sector. Artificial Intelligence, Internet of Things (IoT), Cloud Computing, and Gamification are the technology involve in digital education. All the technologies have large market value in the education sectors. Cloud Computing technology is growing gradually in this sector to capture the market by 2023. Other technology also entering in to the market to enhance the intelligent based education.

Financial Aspect

To establish any EdTech company, it is necessary to invest in infrastructure building. There is a huge cost associated for set up the infrastructure of the organization. It is necessary to invest in various types of hardware, networking devices and other necessary devices purchasing. To build a smart classroom various types of equipment are needed. To purchase all the equipment and furniture. It required huge financial support. Software are the main part of the EdTech Company. To develop a software or any application program it's need huge monetary investment. It is also necessary to invest in Technology. Cloud Computing helps in data virtualization. The main advantage of Cloud Computing Technologies is to reduce the cost of storing data. The EdTech companies are using the Cloud Computing Technologies to get software as a service (SaaS), platform as a service (PaaS), infrastructure as a service (IaaS) and other services. The EdTech companies have to bear huge operational cost. For smooth running of the system, it is necessary to arrange a strong economic and financial support. It is necessary to invest in furniture, office decoration, teacher and staff salary, electricity bill, cleanliness of the premises, and other expenses. Therefore the cost of the development mainly dependent on technological investment, high quality and customize content building, marketing and the sales of the product and services, proper customer support an infrastructure investment.

The main part of the financial aspect of the EdTech companies is to collect the amount from different sources. The EdTech companies follow some revenue stream generation model. The procedure of revenue collection could be differ by company to company. The main source of the revenue is to collect the fees from the student. As the students enrolled in any courses or program, they have to pay the course fee to the organization. The organization could be charged money for given the course completion certificate. Even the students may take admission partially. They have the choice to register themselves for a particular portion of the course. They may enrolled only for the examination or only for the physical mode of classes are only for the online mode of classes. The EdTech Companies have charged the fees for the courses, study material, platform usage, and services and so on. TheEdTech organization also may charge for the certificate after the course competition. SWAYAM is a Government of India initiative under Ministry of Education, Government of India, offering open online based course or program. It is free to access for all but if anyone is interested to get the certificate then it takes little charges for the certificate only. Another source of income for the EdTech Company, is to make the licensing of the softwares or the contents. The companies are offering various services to various institutions and getting payment from them. Many Schools, colleges and other educational institutions also interested to take services from the EdTech companies. With less investment the Institutions make collaboration with the EdTech companies to provide the extra facilities like - Spoken English courses, Carrier development, personality development, profession grooming and many more, to the students. Various Corporates and organizations are also willing to take services for their employees from the EdTech companies to provide different professional development, skill development, personality development, various online training, technological knowledge development and so on. Advertisement and sponsorship are another source of income for the EdTech companies. As the company grown, valuation also grown, therefore their advertisement and sponsorship charges also increases.

Selection of price of any services is very important for the EdTech companies. In this competitive market the companies has to think the cut off price of their services. They have various facilities for the user. The companies fixed a particular charges for a particular course or program. Even a candidate may take a particular part of a program or may take a particular feature of any course. They have the facility to register and pay only for a particular

course. The user have the facility to take the subscription of a particular content or services. They have the facility to pay the subscription fee recurring basis. The user may play the whole subscription at a time or may pay the subscription weekly basis, monthly basis and yearly basis. Even they may get the service on hourly basis pay. The EdTech companies offer various discounts to the user to attract the user. They have the facility to get a discount on bulk subscription. Educational institutions also interested to get this discount for their student. The EdTech companies have different services and different pricing range for B2C (business-to-consumer) and B2B (business-to-business). They adopt different business model for different type of customers.

To establish an EdTech company, it is necessary to invest huge amount of funding. It is necessary to arrange proper economic and financial support. The initial cost of the establishment of an EdTech company is very high. They have different types of expenses. So the company need to arrange financial support and need to raise the funding from different Institutions and organizations. They have collected the fund from various venture capital firms. The EdTech companies are seeking to rise fund from various crowd funding platforms. Even they get the support from Angel investor who are mainly the individual investor. It also noticed that many EdTech organizations have getting funds from various educational institutions. The organizations also getting fund from various state government and Central Government support.

To operate and expand the business, it is necessary to follow various Business models and proper business strategies. It is also necessary to increase the customer acquisition for the company. It is also necessary to retain the customer. The company needs to provide define kind of facilities to the existing customer to retain them and to get different subscription of different production services. The companies have a particular regulatory authority who take care of the customer feedback and resolve the issues of any problem. The company should have an independent research and development (R&D) team. The company will grow more when they have invest more in research and development (R&D). One of the challenging task is to expand the market according to the customer need. They

need to offer different type of services to the user. To expand the market the companies needs to have a strong business strategy an investment in marketing and sales. The company should have a proper cash flow management plan. A proper cash flow management actually control the different type of financial expenses and help to manage the economic and financial condition. The investor will be happy if the business become more profitable and maintain the sustainability. The investor always expecting more from return on investment (RoI). The investor should have a proper exit strategy also. As the company expand they tried to enlist themselves into share market to get the investment from the individual through initial public offering (IPO). There should have a proper cash flow management plan to take care of the profit margin of the business. It is necessary to pretend the market condition and the consumer choice and demand. After meeting the user expectation it is possible to expand the market and increase the value of the company. It is very much necessary for the scalability of the organization. The EdTech Company should have proper risk management plan. They need to transfer the risk with the third party association. Proper risk management strategy will give the protection from the unwanted capital loss. To maintain a stable business it is necessary to provide proper tax to the government. It is also necessary to maintain the transparency from all aspect. To gain the confidence from the investor, and to meet the user requirement it is necessary to maintain the transparency for the company. As the market competition is very high show the organization has to take care of their customer. They have to give the value to the customer's retirement and suggestions. They have to resolve the issues as soon as possible. There should be a dedicated team to resolve the issues. The company should invest on customer satisfaction. The user should have the facility to cancel they are subscription at any point of time. To meet different kind of customer requirement it is necessary to collect money from different sources and invest it into the business properly to grow more.

Table 3 shows the EdTech companies investment in education. Different Technology based educational companies are investing in education to extent the digital education or online education. ByJus,

Unacademi, upgrade, Leverage Edu, Vedantu, Toppr, and Simpli learn following sample of EdTech company investment data analyzed in this study to know how these digital education based companies progressing in education. ByJus is one of the largest EdTech Company investing large amount in smart and digital education. It is also observed that other EdTech companies also compete with each other according to the investments.

Table 3: EdTech Company Investment

EdTech Company	Funding in dollars (Unit million)
ByJus	2200
Unacademi	398.5
Upgrade	149.5
Leverage Edu	9.8
Vedantu	203.2
Toppr	110.8
Simpli learn	28

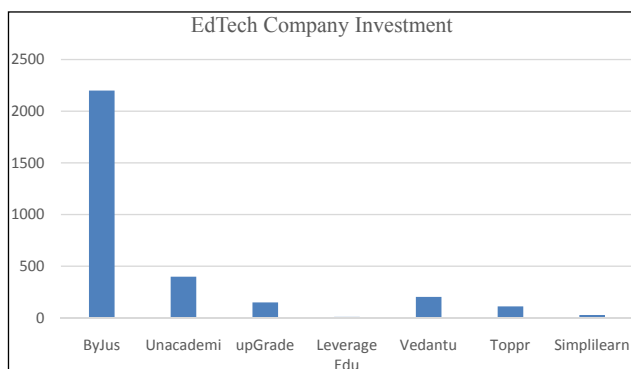*Data Source:* https://www.leadsquared.com/industries/EdTech/EdTech-companies-in-india/

Fig. 3: EdTech Company Investment

Techno-Financial Challenges

Various EdTech companies are trying to establish their businesses in India. There is many prospects to establish their businesses into a big country like India. It is very difficult to initially start their businesses with the use of Technology based platform. EdTech companies in India have faced many challenges to set up their organization. The companies have faced various types of technological challenges and financial challenges which are discussed below:-

Technological Challenges

To establish a good EdTech company it is necessary to adopt modern technologies. In real time it has seen that the EdTech companies have faced many technical and technological challenges. The main challenges faced by the Ed Tech companies is to build a Technology based system. The system will actually perform different tasks. From learning management system to student management, from course designed to customize study material generation, from student admission to student fees collection, from operational cost management to staff and teacher salaries and many more task has been performed by the Ed Tech companies. The complete system is machine dependent. So it is very challenging task to build a complete Technology dependent system. It has used different basic and emerging Technologies. Information Technologies play a vital role for the EdTech companies. So it is very challenging to manage different components of the information technology (Paul *et al.* 2017). It is very challenging task to establishing the connection between different components of network Technologies, web technologies, database Technologies and multimedia Technologies. Information and Communication Technology (ICT) help in establishing connection between define networks. The whole system is completely dependent on Information and Communication (ICT) Technologies. The use of advanced ICT Technology is necessary for the stability off the network. To provide the facility through online mode it is necessary to establish a strong and stable network connection. It is very tough task to assure and maintain the uninterrupted network connectivity during the online classes. Therefore the network establishment is a big technological issues faced by the Ed Tech companies. Another challenging task is to resolve the technical issues. As the complete system is technology dependent, naturally it has used different hardware, network devices, educational tools, and so on. Thus there has arisen any technical problem, then it is necessary to solve the issues as soon as possible. Another technological challenging task is to upgrade the system regularly. With the advancement of the technology it is necessary for the Ed Tech companies, to upgrade and update the existing system to provide the best customer experience with high efficiency. It is another challenging job is to maintenance of the existing system. It is necessary to maintain the system properly. As the size of

EdTech companies are quite large, so it has different types of devices, computers and servers. Regular maintenance is necessary for the smooth running of the organization.

With the use of Technology the student faces many difficulties. The student of the class K to 12 are not technically sound. So it is very difficult for the student to cope up which technology based learning environment. The students are familiar with campus based face to face learning. To adopt a technology based new system is very challenging for the students. The students have faced many difficulties during the Technology based learning provided by the Ed tech companies. It has been observed that the attention span of students is very short in online mode of learning. Very easily the students are diverted during this online classes. The surrounding environment disturbance is another problem faced by the student. Another problem with technology-enhanced learning is students' lack of motivation. As the classes are internet based online learning, so the students are losing their concentration easily. Technology Oriented Learning does not provide any special facilities for child with special need (CWSN) students. So facilitating CWSN students is a big technical and technological challenge.

Teachers are one of the important user of the system. Teachers delivers their lectures with the use of Technology. It is necessary for the Teachers to know the use of the technology base medium to deliver their lesson. So teachers need to be technically proficient. The size of Ed Tech companies are big, large number of teachers are worked as a faculties in this organization. It is technologically a challenging task to train all the teachers who are the main backbone of the company. The teachers are face many technological difficulties with the system. There is very limited scope of interaction with the student compare to campus based face to face mode of learning. The system is less user friendly from the teachers' point of view. The system provide very limited access to the teachers. There is lack of personalization. The system will not provide any kind of personalized environment to the teachers. As teachers are not able to monitor all the students, teachers are discouraged for long sessions and lack motivation to deliver continuous lectures. For the technology based learning, time is one of the important constraint. If the teachers take

some more time to clear the concept to the student, then the allocated time for the teacher may run out. Time management is thus technology dependent. It is necessary for the system to consider the teachers' perception regarding the technological challenges of this Edtech companies.

Technology dependent system are very much helpful for the staffs and the administrators ofthe EdTech companies. The staff faced the difficulties in graphical user interface (GUI). Sometimes there confused with define navigation planes. So it is necessary for the staffs to provide proper training for the efficiently management of the system. Administrative person of the EdTech companies need a define kind of statistical information. So it is necessary to incorporate the management information system (MIS) with this system. Without having proper mechanism, it is very difficult to provide deferent kind of statistical information which are responsible to growth of the EdTech Company. So it is very challenging task to build a strong and efficient system which could able to provide different kind of activities and help in the progress of the organization.

Financial Challenges

To establish an EdTech company it is necessary to invest huge money. As the size of the company grew, so did the need more finance support. So, it is one of the challenging tasks to manage the huge financial burden. The money is required for different purposes. It is necessary to invest money for various technological support and for operational cost. It is necessary to establish a strong infrastructure for the smooth running of the organization. The organization should have many Hardware to give the services properly. The EdTech company required a huge amount to invest in hardware like computers, projectors, interactive black boards, printers, scammers, router, Bridge, hub and other networking devices. It is also necessary for the EdTech companies to create their own software and applications to provide the best experiences to the student. To create the software The EdTech companies need a software development team. The software is a big challenge for this companies. Thus it is associated with a huge economic and financial requirements. After implementation of the software it is necessary to maintain it properly.

Software maintenance is also associated with financial requirements. It is necessary to incorporate different facilities, different courses or programs, and various other strategically changes time to time, show to modification of the software regularly it needs financial support. It is sometime necessary to migrate the system from one programming environment to another. It is also necessary to adopt various basic and emerging Technologies. The emerging Technologies have played a vital role in EdTech companies. Cloud Computing, Big data Analytics, IoT, block chain Technologies and various other emerging Technologies are necessary to execute the system efficiently. Financial support is needed to purchase this emerging technology. An EdTech company should have its own server machine. It is very challenging task to maintain the servers. To use this servers necessary to invest money. The whole system is completely dependent on internet support, so it is necessary to invest a huge amount for the internet data cost. To get high speed, uninterrupted internet connectivity, The EdTech Company should invest in proper internet data plan and the network infrastructure.

To operate the company efficiently it is necessary to invest a huge amount. To establish an EdTech company the basic requirement is to invest in infrastructure off the company. It is necessary to establish a physical infrastructure for the smart classes, teacher's room, offices, backend tasks, and administrative task and so on. It is also necessary to invest different furniture required for the operation purpose. It is also necessary to arrange the seat for the student who are interested to attend the class physically. It needs to invest amount for regular operational cost like cleaning off the institution, setup of air conditioner (AC), electricity bills and many more. The main requirement of the financial support is to pay the salary to the teachers and various employees associated with the organization. A good EdTech company provide the regular training to their teachers. To give the training to the teachers needs financial involvement. To manage the huge economic and financial investment, the EdTech companies in India requires financial investor for their organization. A good company always tries to overcome technological and financial challenges to grow the company.

CONCLUSION

EdTech companies are playing a vital role in Indian education system. The students are interested in various type of competitive exam courses, entrance examination courses and government job preparation courses. Students also take courses for their School education. The EdTech companies are helping the student enhance their knowledge parallel with their school education. Various different types of methods has been taught by this companies to crack the competitive exam easily by the student. The companies are provided different kind of forces with very less amount of cost show the students are also interested to take the courses. There is no geographical boundaries to get the admission in any courses so the student would get interested to take any kind of courses according to their interest. The market of the EdTech companies are expanding day by day. It has been noticed that the business of the EdTech companies have grown after the covid-19 period. The EdTech companies are continuously updated themselves to serve better to the students. The EdTech companies in India expanding their businesses all around the world by following proper managerial strategy and with strong economic and financial support. So it may conclude that Technology and the financial support are main pillar of the EdTech companies.

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