A Survey on Impact of IoT Enabled E – Learning Services

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Abstract— Technical skills and knowledge gaining are taken care in today's learning scenario. Internet of Things (IoT) refers, to technological advancements in the networking with the help of which real-world entities can be connected to communicate with each other over the internet. In general, replacing the teacher or giving quick instruction is not the goal nowadays. To do so, academic institutes should investigate the future technologies that comes out. An IoTs enabled lecture hall, or Personal Computer is beyond question that is capable of serving custom-made training for learners with personal demands, connected with learning exposure, active evaluation, trouble-free right to take advantage mutually by both learners and teachers for the smooth progress of remote learning. From the managerial aspect the effectiveness and payback is also high. This paper, discuss about the study on impact and model of IoT based e-Learning system with technological advancements in the networking with the help of which real-world objects can be connected to communicate with each other over the internet and also conclude how machine learning algorithms enhance the performance of IoT enabled E-learning system.

Keywords—IoT, applications of IoT, e-learning, IoT architecture, ubiquitous learning

I. INTRODUCTION

Some of the futuristic IoT artillery in education domain comprise of digital highlighters, smarter boards. It means the printed text could be digitally pass on to the smartphone or any other app at an unbelievable speed through tools similar to Scan marker and c-pen. Interactive boards can acquire recognize, and reciprocate data, make things easier and kindle the overall learning activity. Just visualize an outline where learner sitting in a classroom or in front of a PC at their home can interact with their friends, classmates, teachers, and educators scattered over the world. Now, let's suppose the lesson of the day has focused on sea life. To give students an especially exciting – and profoundly educational - experience, the mentor decides to access live information caused by sensors and live feeds monitoring a particular body of water. The IoT refers to a better vision whereby 'things' (objects) such as everyday objects (entity), places, and environments have interconnected with one another via the Internet. An example of a simple IoT object now available in some homes is a thermostat which can determine when people occupy certain rooms and alter levels of heating, lighting and other functions in the house accordingly. By widening the Internet from "a network of interconnected computers to a network of interconnected objects," the IoT will cover a vast and complex network of devices. These devices will add sensors to measure the data

of environment around them, actuators which physically act back into their environment such as processors to handle, opening the door and store the massive data generated, nodes to send the information and organizers to help manage sets of these parts. Through this, it has the potential to significantly extend, enrich and even shift the relationship between people and the world around them. In fact, many are hoping that the IoT will play a pivotal role in addressing many of today's societal challenges such as an aging society, deforestation, traffic congestion and recyclability. This interconnection of physical objects is expected to magnify the profound consequences that large-scale networked connections are having on our organization, gradually resulting in a genuine paradigm shift [1]. In this paper, it has been review recent E-Learning-related literature associated with the IoT vision. One aim is to provide a resource for the E-learners to understand the current state of research associated with the new IoT agenda.

II. RELATED WORK

In this section, some of the earlier works on the subjects have cited. According to Cisco [2], the organizations have already experienced the Internet of Things (IoT) - the networked connection of things, soon some capabilities like context awareness, energy independence, and increased processing power are added to these things then IoT becomes IoE

(Internet of Everything). Also, according to their research, 99.4 percent of physical objects which can be a part of IoE is yet to be connected [3]. The whitepaper concludes by saying, "There is tremendous value in connecting the unconnected with intelligent networks across education. This paper demonstrates IoE's potential impact on making education more relevant, engaging and motivating learners, and enabling faster time to mastery. Neverthless to cognize the utility of joining mankind, processes, information and things with reliable network and uninterrupted access need to be More over for IoE to be acredited, both guaranteed. decisionmakers and instructors must be well-trained not only to work but also to realize possible risks. IoT will enable lifeenhancing services, regarding the role of IoT in education say, "In education, mobile-enabled solutions will tailor the learning process to each student's needs, improving overall proficiency levels, while linking virtual and physical classrooms to make learning more convenient and accessible [4]. IoT might serve as the backbone for the universal learning environment and enable active smart environments to accept and identify objects and retrieve information from the internet to facilitate their adaptive functionality [5]. A learner may gain the knowledge not only by connecting to the learning contents via networks by using desktop computers or wireless handheld devices such as Personal Digital Assistants (PDAs) and mobile phones but also by communicating to the microprocessors (e.g., RFID - Radio Frequency Identification) embedded in devices." In the reference paper[R], two groups 25 students each were enrolled in a similar course. However, one group was taught using traditional methods and other using an interactive system of the internet of things. After conducting various tests and analysis, they concluded that "Internet of Objects, applied as a tool to support the teaching process, improves student academic performance".

III. IOT ENABLED APPLICATIONS

The following table 1 represents the related works done on the IoT enabled applications for different domains.

Table 1: <i>F</i>	Related works	done or	the I	'oT en	abled a	applicatio	ns
in differe	ent domains						

Authors	Title of the paper	Application	Description
Theodoridis, Evangelos, Georgios Mylonas, and Ioannis Chatzigiann	Developing an iot smart city framework	Smart city	Monitor the parking places accessibility in the city.
Noel,	Structural Health	Structural	Monitor of
Adam, et al	Monitoring using	health	ambience and
[7]	Wireless Sensor		objects conditions

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	Networks: A		in buildings, bridges
	Comprehensive		and historical
	Survey		monuments.
Majumder,	A wireless IoT	Smartphone	Detect iPhone and
AKM	system towards gait	Detection	Android devices
Jahangir A.,	detection in stroke		and in general any
et al [8]	patients		device which works
			with WiFi or
			Bluetooth
			interfaces.
Ozger,	Energy Harvesting	Electromagn	Measurement of the
Mustafa,	Cognitive Radio	etic Field	energy radiated by
Oktay	Networking for	Levels	cell stations and
Cetinkaya,	IoT-enabled Smart		WiFi routers.
and Ozgur	Grid		
B. Akan [9]			
Jeyasheeli,	An IOT design for	Smart	Intelligent and
P. Golda,	smart lighting in	Lighting	weather adaptive
and JV	green buildings		lighting in street
Johnson	based on		lights.
Selva [10]	environmental		-
	factors		
Keerthana,	Internet of Bins:	Waste	Detection of rubbish
B., et al[11]	Trash Management	Managemen	levels in containers
	in India	t	to optimize the trash
			collection routes.
Shaikh,	Enabling	Forest Fire	Monitoring of
Faisal	technologies for	Detection	combustion gases
Karim,	green internet of		and preemptive fire
Sherali	things		conditions to define
Zeadally,			alert zones.
and Ernesto			
Exposito[12			
]			
Obara,	A densely	Earthquake	Distributed control
Kazushige,	distributed high-	Early	in specific places of
et al[13]	sensitivity	Detection	tremors.
	seismograph		
	network in Japan		
Weidhaas,	A case study for	Chemical	Detect leakages and
Jennifer,	orphaned	leakage	wastes of factories
Lian-Shin	chemicals: 4-	detection in	in rivers.
Lin, and	methylcyclohexane	rivers	
Karen	methanol (MCHM)		
Buzby [14]	and propylene		
	glycol phenyl ether		
	(PPH) in riverine		
	sediment and water		
	treatment		
	processes.		
Gupta,	Automatic and	Water	Detection of liquid
Shikha	Intelligent	Leakages	presence outside

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Pranesh, and	Integrated System		tanks and pressure				
Umesh	for Leakage		variations along	Authors	Title of the paper	Keywords	Description
Kumar	Detection in Pipes		pipes.	Bystrova, T.	Introduction of	Information	The description is
Pandey [15]	for Water			Yu.	open e-learning	society	made of the cost
	Distribution			Larionova, V.	system as a factor	Educational	options for open-
	Network Using			А.	of regional	paradigm	type e-learning
	Internet of Things	1 (2) (Osborne, M.	development	Regional	course
El-Din,	Internet of Nano	M2M	Machine auto-	Platonov, A.		development	development,
Hemdan	Inings and	Applications	diagnosis and assets	M. [21]		Lifelong	investment
Ezz, and D.	of Things		control.			learning	parameters for
H. Manjalan	or rnings					E-learning	their
	Provise Positioning	Intelligent	Acquiring			Open e-learning	establishment, as
Tsai, Tao-	of Marketing and	Shopping	notifications in the			Educational	well as costs of
[17]	Behavior Intentions	Applications	point of sale based			resources	implementing
[17]	of Location-Based	Applications	on consumer			Massive open	educational
	Mobile Commerce		practices tastes			online course	programmes with
	in the Internet of		existence of			Nancial model	the application of
	Things		susceptible elements			Economic efect	e-learning. The
	Timgs		for consumers or				investigation of
			expiry dates				the tasks of Ural
Tao, Fei, et	Internet of Things	Smart Grid	Energy				Federal University
al [18]	in product life-	Sinur Ond	consumption				on e-learning
	cvcle energy		monitoring and				application impart
	management		management.				the possibility to
Veeramanic	IOT enabled	E-learning	In digital era our				the conceive
kam, M. R.	Futurus Smart	C	College campus				from the
M., and M.	Campus with		need of IoT				launching of a
Mohanapriy	effective E-		technology for				learning in other
a [19]	Learning: i-		classy environment				academic
	Campus		to utilize				institutes
			effective E-learning.	Islam, Nurul	E-learning	e-learning	This paper
Auer,	Online Engineering	Smart E-	IoT technology for	Martin Beer.	challenges faced	higher	references some of
Michael E.,	& Internet of	learning	classy environment	and Frances	by academics in	education,	the researc work
and Danilo	Things:		to utilize	Slack [22]	higher education:	academic	on the limitations
G. Zutin,	Proceedings of the		effective E-learning		a literature review	challenges, e-	of e-learning
eds [20]	14th International					learning in	technology,
	Conference on					Middlesex	categorises it in
	Remote					Universit	five challenges
	Engineering and						that teachers are
	Virtual						faced with and
	Instrumentation						suggestions for a
	REV 2017						successful e-
Л	7. THE IOT ENA	BLED E-LEA	ARNING				learning outcome.
							This literature
E-l	earning is current	ly implemen	ted using various				reviw furthremore
Lists d in T	and technologies.	some techn	ologies (Some of				reviews the
Listed in Ta	able 1) nave been	specifically	ueveloped for the		1	1	usefulness of e-

Table 2: Related works done on IoT enabled E-Learning

same while others can be used as successful E-learning tools.

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Some Technologies used in E-learning are:

in

learning

techniques

Middlesex

University and a

			few difficulties		
			they face.		
Kong, Siu	E-learning in	E-Learning,	This paper aims to		
Cheung, et al	School Education	School	discuss the		
[23]	in the Coming 10	education, 21 st	research issues		
	Years for	century skils,	and policy		
	Developing 21st	Research issues,	implications		
	Century Skills:	Policy	critical for		
	Critical Research	implications	achieving such a	V.	МАСН
	Issues and Policy	-	curriculum goal. A	The follow	ving tabl
	Implications		review of	by using M	Iachine I
	-		literature in the	T 11 2.	D -1 -4 - 1
			related fields	Table 3: 1	Keiaiea alaonitha
			indicates that K-	Learning a	ugorunn
			12 schools should		
			take advantage of		T1 1 0
			e-learning to	Authors	Title of
			maximize learning	Zou, Han,	A fast a
			opportunities of	et al [26]	indoor
			learners for the		algorithm
			development of		an online
			21st century skills.		extreme
Charmonman.	e-Learning and the	Educational	e-Learning and the		machine
Srisakdi, et al	Science of	paradigm	Science of		
[24]	Instruction:	Regional	Instruction is the		
[=.]	Proven Guidelines	development	ultimate handbook		
	for Consumers and	Lifelong	for evidence-based		
	Designers of	learning	e-learning design		
	Multimedia	E-learning	Since the first		
	Learning	Open e-learning	edition of this		
	Learning	open e learning	book e-learning		
			has grown to		
			account for at least		
			40% of all training		
			delivery media		
			However digital		
			courses often fail		
			to reach their		
			potential for		
			learning		
			effectiveness and		
			efficiency		
Charmonman	Applications of	Internet of	This paper will	Lane,	An earl
Srigalidi at al	Internet of Things	Things IoT in	discuss IoT in	Nicholas	character
[25]	in E Looming	al corring IoT	al corring and	D., et al	deep le
[23]	III E-Leanning	eleanning, 101	instructional	[27]	wearable
		dilu instructional	design trainin-		smartpho
		design	aesigii, training		internet-o
		design,	employees on IoT		devices
		101 and	technology, six		
		training, Skills	skills for IoT		
		tor IoT, Internet	applications,		
	1	l of	Internet of	11	1

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Learning	Learning Things,
Things, IoT to	IoT potentials
transform	to transform
education, IoT	education, and IoT
to improve	to improve
student	student
performance	performance

V. MACHINE LEARNING ALGORITHMS IN IOT

The following table 3 depicts the related works done in IoT by using Machine Learning algorithms.

Table 3: Related Works done on IoT using MachineLearning algorithms

	Authors	Title of the paper	Keywords	Description
)	Zou, Han,	A fast and precise	Biomedical	This article differs
5	et al [26]	indoor localization	monitoring,	from seamlessly
Ε		algorithm based on	Biomedical	linking multimodel
e c		an online sequential	monitoring,	data-collecting
L		extreme learning	Sensors,	infrastructure and
<u> </u>		machine	Medical	data analytics
e			services,	together in an AAL
t			Smart homes,	platform. This
9			Logic gates,	article also outlines
1			Assisted	a multimodality
1			living,	sensor platform
			Ambient	with heterogeneous
t			networks,	network
s			Internet of	connectivity, which
5			things	is under
)				development in the
t				sensor platform for
5				healthcare in a
				residential
1				environment
1				(SPHERE)
r				Interdisciplinary
r				Research
1				Collaboration
1				(IRC).
_	Lane,	An early resource	behavior and	The aim of this
	Nicholas	characterization of	ambient	investigation is to
1	D., et al	deep learning on	context, IoT,	begin to build
1	[27]	wearables,	Deep	knowledge of the
		smartphones and	Learning,	performance
5		internet-of-things	smartphones,	characteristics,
,		devices	wearable	resource
			systems.	requirements and
				the execution
e				bottlenecks for
L				deep learning

Zou, Han, et al [28]An online sequential extreme learning machine approach to WiFi based indoor positioningIEEE 802.11 Standards, Calibration, Accuracy, Testing, Accuracy, machine approach to WiFi based indoor positioningIEEE 802.11 standards, calibration, online sequential training, extreme learning Accuracy, machine cOS- Testing, the problems such on manpower, time algorithmsA location algorithms the problems such or offline site survey and the inflexibility to or environmental dynamicsAlsheikh, Mohamma a Abu, et al [29]Machine learning in networks: strategies, and applicationsWireless sensor networks, algorithm, algorithm				models when being
Zou, Han, et al [28]An online sequential extreme learning machine approach to WiFi based indoor positioning of wiFi based indoor positioningIEEE 802.11 Standards, Calibration, Calibration, algorithm based online sequential to WiFi based indoor positioning Mathematical algorithmsA location extreme learning machine difference to address Heuristic algorithmsAlsheikh, Mohamma d Abu, et al [29]Machine learning in networks: Algorithms, strategies, and applicationsWireless sensor networks; categing machine algorithms, sensorNireless sensor networks, categing or and extensive sensor ilterature review networks; categing strategies, and applicationsWireless sensor networks, categing machine learning learning learning learning algorithms, strategies, and applicationsMiceless sensor networks, categing sensor or any sense sensorAn extensive categing on mapower, time algorithms, sensorLane, Nicholas D, et al [30]A large-scale web industrial Internet of nustrial Internet of industrial InternetKernel least machine learning algorithms, sugested cationsApply the derived coefficients for the principal algorithms algorithms solutions to the related issues.Lane, Nicholas D, et al [30]A large-scale web industrial Internet of industrial Internet of industrial Internet of industrial Internet of industrial Internet of internet of 				used to recognize
Zou, Han, et al [28]An online sequential extreme learning machine approach to WiFi based indoor positioningIEEE 802.11A location algorithm based Calibration, Parking, extreme learning Accuracy, machine (OS- Testing, Mathematical algorithmsMachine sequential training, extreme learning machine (OS- resting, Mathematical algorithmsColibration, extreme learning machine (OS- resting, Mathematical algorithmsAccuracy, resting, machine (OS- resting, machine (OS- resting, Mathematical algorithmsELM) to address the problems such as intensive costs houries survey and the inflexibility to environmental dynamicsAlsheikh, Mohamma al Aburital [29]Machine learning in networks: algorithms, strategies, and applicationsWireless esnoorAn extensive literature review networks, over the period Routing, 2002-2013 of Machine algorithms, used to address Clustering algorithms, algorithms, algorithm, algorithms, suggested principal algorithm, algorithm are assessed against the analysis, related issues like related issues.Lane, Nicholas D, et al [30]A large-scale web Rouge prediction Scheme for the Industrial Internet of Things based on a QoS prediction FearsonKernel least prediction of prediction performance study coefficient prediction of prediction performance study coefficient prediction of prediction of prediction of prediction of predict				categories of
Zou, Han, et al [28]An online sequential extreme learning machine approach to WiFi based indoor positioningIEEE 802.11 Calibration, Accuracy, Testing, Mathematical the problems such as intensive costs Heuristic algorithmsAccuracy, machine (OS- Testing, Hathematical the problems such as intensive costs on manpower, time algorithmsAlsheikh, Mohamma d Abu, et al [29]Machine learning in wireless sensor strategies, and applicationsWireless sensorAn extensive infexibility to environmental dynamicsAlsheikh, Mohamma d Abu, et al [29]Machine learning in strategies, and applicationsWireless sensorAn extensive ilterature review nachine learning inductive learning algorithms, strategies, and algorithms, algorithms, strategies, and applicationsMachine learning ilterature inductive learning algorithms, strategies, and algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithms, algorithm analysis, related issues like Classification algorithms algorithms for esaid issues.Lane, Nicholas D, et al [30]A large-scale web kernel for the prediction findustrial Internet of the web also the novelty of learning algorithm learning algorithmKernel least mansing web toreficient prediction of services (QoS) missing web industrial Internet of the web also the novelty of learning algorithmLane, Nicholas D, et al [30]A large-scale web <b< td=""><td></td><td></td><td></td><td>behavior and</td></b<>				behavior and
Zou, Han, et al [28]An online sequential extreme learning indoor positioningIEEE 802.11A location algorithm based online sequential to WiFi based indoor positioningStandards, algorithm Accuracy, Testing, Heuristic algorithmsalgorithm based online sequential extreme learning indoor positioningAlsheikh, Mohamma dhab, et al (29)Machine learning in wireless sensor sensorWireless esnor entworks; networks,Machine learning in or offline site survey and the inflexibility to environmental dynamicsAlsheikh, Mohamma applicationsMachine learning in networks; networks,Wireless sensorAn extensive period algorithms, algorithms, algorithms, algorithms, strategies, and applicationsWireless sensorAn extensive period algorithms, algorithms, suggested principal algorithms, suggested principal algorithms, suggested principal algorithms, suggested principal algorithms algorithmsAlagorithm are assessed against the volta address clustering assessed against the analysis, related issues like mean squareLane, Nicholas D, et al (30]A large-scale web kernel machine learning algorithm extress for the goods prediction predictionKernel least mean square QoS prediction prediction QoS prediction predictionApply the derived coefficient periorid periormance study coefficient periormance study coefficientLane, Nicholas D, et al (30)A large-scale web kernel machine learning algorithm iearning algorithm iearning algorithm iearning algorithm iearni				context.
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machine approach to WiFi based indoor positioningCalibration, Training, Accuracy, Testing, ELM) to address Mathematical a sintensive costs Heuristic algorithmsELM) to address as intensive costs for offline site survey and the inflexibility to environmental dynamicsAlsheikh, Mohamma d Abu, et al [29]Machine learning in networks: Algorithms, applicationsWireless ensor networks, ensorAn extensive environmental dynamicsAlsheikh, Mohamma d Abu, et al [29]Machine learning in applicationsWireless ensor networks, ensorMachine environmental dynamicsAlsheikh, MohammaMachine learning applicationsWireless ensorAn extensive ensor entworks, ensorJagorithms, applicationsWireless ensorNote to address ensor ensor algorithms, used to address clustering algorithms, algorithms, algorithm algorithms, enset to address clustering algorithms, algorithm, enset to address clustering algorithm, enset to address clustering algorithm, enset to address clustering algorithm, enset to address clustering algorithm, erated issues like machine learning algorithm, erated issues sugested principal algorithm algorithm algorithm algorithm algorithm erated issues sugested principal algorithm algorithm algorithm algorithmLane, Nicholas D, et al [30]Alarge-scale web scheme for the prediction prediction principal algorithm eraning algorithm eraning algorithm eraning algorithm eraning algorithm eraning algorithm eraning algorithm<	et al [28]	extreme learning	Standards,	algorithm based
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Indoor positioningAccuracy, Testing, Mathematical model, as intensive costs on mapower, time algorithmsmachine (OS- ELM) to address Mathematical model, as intensive costs on mapower, time algorithmsAlsheikh, Mohamma d Abu, et al [29]Machine learning in networks: strategies, and applicationsWireless sensor networks, networks, networks, over the period learning learning applicationsAllorithms, networks, nodes that were algorithm, networks, nodest means of algorithm are novelty of nearning patterns that will provide solutions to the afore said issues.Lane, Nicholas D., et al [30]A large-scale web novelty of Industrial Internet of Things based on a pearsonKernel least nearning algorithm service QoS networks prediction service QoS service QoS values, prediction pred		to WiFi based	Training,	extreme learning
Lane, Nicholas D., et al (30)A large-scale web Nicholas D., et al (30)Testing, Mathematical model, Heuristic algorithmsELM) to address the problems such as intensive costs on manpower, time algorithms survey and the inflexibility to environmental dynamicsAlsheikh, Mohamma d Abu, et al [29]Machine learning in networks: strategies, and applicationsWireless sensor networks, Routing, 2002-2013 of strategies, and algorithms, used to address Clustering analysis, related issues like model, analysis, related issues like novelty of learning algorithmsMachine elarning methods that were algorithms, algorithms, used to address clustering algorithms, algorithms, algorithms the web also the analysis, related issues like model, analysis, related issues like model, model, algorithmsLane, Nicholas D., et al [30]A large-scale web scheme for the industrial Internet of hustrial Internet of Fung algorithmKernel least service QoS values. ParsonApply the derived prediction of service QOS values. ParsonLane, Nicholas D., et al [30]A large-scale web scheme for the industrial Internet of hustrial Internet of hustrialKernel least prediction of service QOS values. ParsonApply the derived prediction of meansquare corflicients for the prediction of services (QOS)Kernel machine learning algorithmPearson performance study cofficient based on a public (PCC)An extensive performance study cofficient based on a public (PCC)		indoor positioning	Accuracy,	machine (OS-
Lane, Nicholas D., et al Nicholas D., et al (30)A large-scale web Nicholas D., et al al al of scherel machineMathematical model, Heuristic algorithmsthe problems such as intensive costs om manpower, time algorithmsLane, Nicholas D., et al al (30)A large-scale web Rothing algorithmKernel networks Rest algorithms, scherel Kernel Rest algorithmsAn extensive extensive extensive algorithms, algorithm, <b< td=""><td></td><td></td><td>Testing,</td><td>ELM) to address</td></b<>			Testing,	ELM) to address
Image: series of the series			Mathematical	the problems such
Lane, NicholasA large-scale web NicholasHeuristic algorithmson manpower, time for offline site survey and the inflexibility to environmental dynamicsLane, NicholasMa large-scale web RouteWirelessAn extensive extensive networks;Algorithm algorithms, algorithm, algorithm, algorithm, algorithm, algorithm, algorithm, algorithms, algorithm, algorithms, algorithm, algorithm, algorithm, algorithm, algorithm, algorithm, algorithm, algorithm, algorithm,<			model,	as intensive costs
Image: series of the series			Heuristic	on manpower, time
Alsheikh, MohammaMachine learning in wireless sensorWirelessSurvey and the inflexibility to environmental dynamicsAlsheikh, MohammaMachine learning in wireless sensorWirelessAn extensive sensorAn extensive sensor[29]Algorithms, strategies, and applicationsWirelessAn entworks; networks, applicationsOuting, earning learning algorithms, algorithms, sused to address Clustering common issues in algorithms, suggested Principal algorithms algorithmswireless algorithm analysis, related issues like related issues like relating patterns that will provide solutions to the aring patterns that will provide solutions to the aring sexed on a precicion of Industrial Internet ofKernel least precicion services (QoS) missing web services QoS values. Pearson An extensive coefficient based on a public (PCC) data set is Industrial conducted to verify Internet of the prediction			algorithms	for offline site
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VI. CONCLUSION

Internet of Things (IoT) by now distribute connectivity to a wide range of devices, enabling the progress of novel services and applications. In the field of education domain, IoT will carry E-learning to the next level. This paper elucidate the related works carried out on the implementation of IoT in different fields and the applications that make use of IoT and the comprehensive depiction of the work done on IoT based E-Learning system and the IoT using Machine Learning algorithms. In the future, this IoT based E-learning can leverage the power of IoT to implement a smart learning environment that facilitates better learning and higher retention rates. This advancement in education to fabricate enhanced folks with proficiency and know-how.

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