



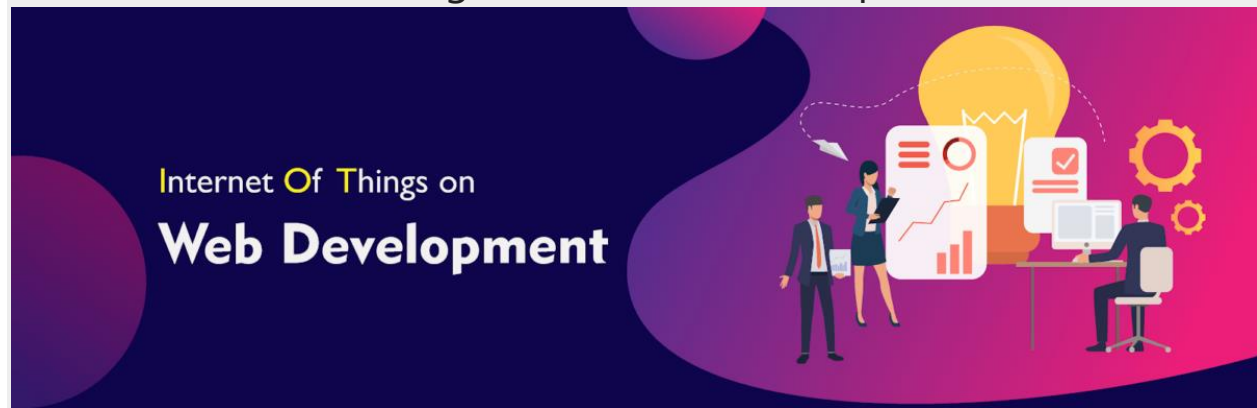
SNS COLLEGE OF ENGINEERING



(Autonomous)

DEPARTMENT OF CSE -IoT & CYBER SECURITY INCLUDING BCT

Role of Internet of Things(IoT) in Web Development



[Invicti Web Application Security Scanner](#) – the only solution that delivers automatic verification of vulnerabilities with Proof-Based Scanning™.

Technology has made human lives better, faster, and comfortable.

Over the past few years, technology has witnessed massive growth, and it is continuously happening. Technology has contributed a lot to the betterment of human lives and has created limitless multifunctional devices such as superfast computers, smart mobiles, advanced robots, self-driving cars, and a lot more.

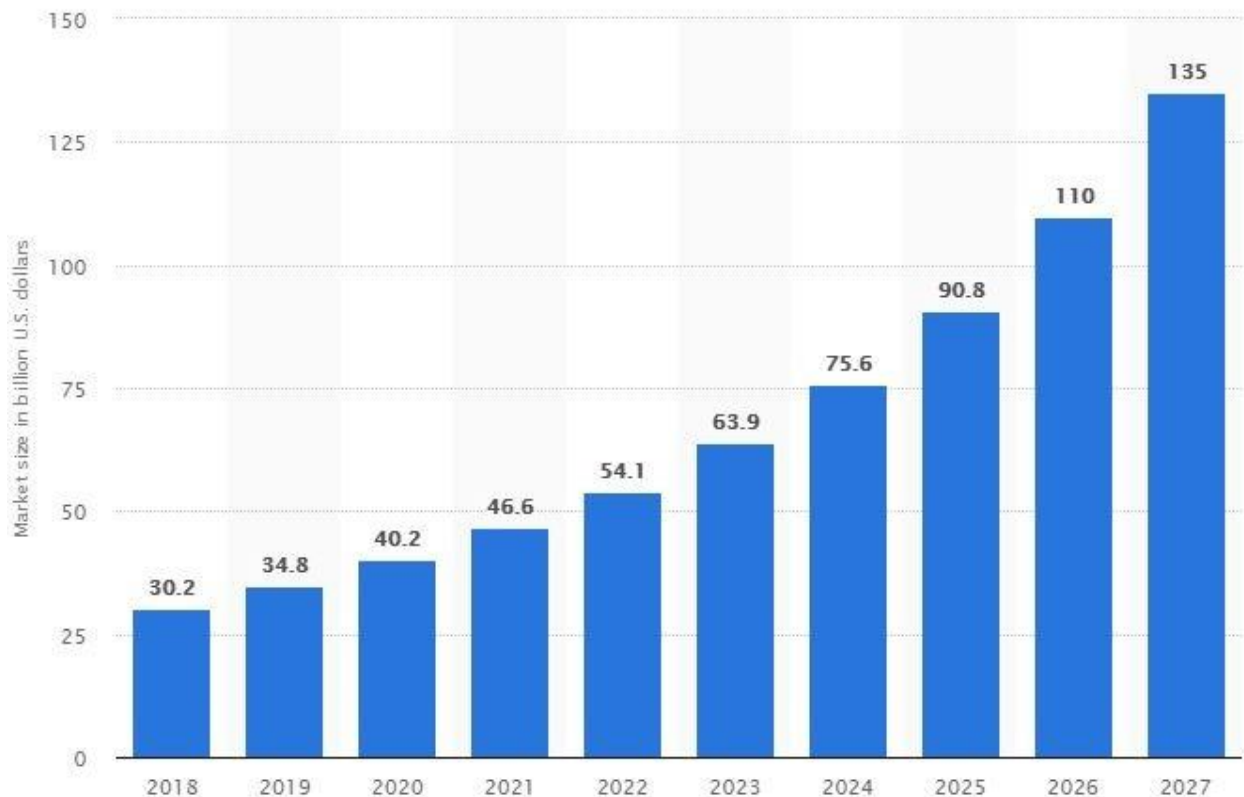
Internet of things (IoT) was experienced by everyone who has mobile phones, laptops, wearables, washing machines, [smart speakers](#), and electronic gadgets connected with the Internet. Many areas that IoT will make changes, which includes Web Design and Development. It can help us to develop the future effectively.

Internet of Things is a technology that connects the digital world by transforming the UI interactions between humans and machines. Now IoT entered into the realm of Web Development and makes users more interactive with the websites. And create a smart & significant role in the development world.

Its immense power of connectivity and computerized sensibility feature help to understand the client features and build the right strategies.

IoT edge in web development will make change the front-end interface and user interactions etc. All users will use this front-end interface to communicate with cameras, sensors, and other devices on the Internet.

IoT connected devices will reach nearly 75 Billion by 2025, according to [Statista](#).



© Statista 2019

So what are the things on the Internet, do you have any idea?

And how it is going to impact the future of web development?

Let's deep dive into the How Internet of Things will change Web Development,

IoT is an evolution of home, mobile, and embedded applications connected to the Internet also it makes to integrate higher compute capability and to use data analytics to extract meaningful information.

Role of IoT in Web Development

Internet of things connects the devices & humans with the learning of innovation. Now, the IoT will be set up in a Web Development industry to make web architecture and User Interface's more creative and interactive. IoT will create advanced communication between website layouts and operational models.

IoT has a broad intensity of things like sensors, cameras, signaling equipment, etc. It will ensure to solve client requests effectively and build up the correct directions.

At present, many IoT devices may be able to display website information and results. It includes laptops, smart appliances like AC's and microwave ovens, etc., and Industrial monitors like embedded systems. It plays a vital role in Web Development, and it is beyond all these technologies.

IoT Web Development Differs from Conventional One

Internet of Things on Web development is more complicated than current web development and design. IoT web development deals with a massive amount of data, excessive communications, security, ever-changing UIs, and reliability issues.

The following are some of the essential factors that IoT will make changes in web development.

Collecting and Processing High Volumes of Data

IoT systems work with a vast amount of data because they collect data from sensors and process them to transfer data through the cloud network. If this kind of data transmits through regular websites, it causes a delay in systems. But in IoT-enabled systems, this data is processed and sent through cloud networks, so there is no need to worry about delays in the system. IoT development keeps more focus on the network's reliability and scalability than the standard web development.



What is Scalability?

It assures data distribution and collection but doesn't depend on the volume of data.

What is Reliability?

It means every system produces accurate results without any delay, in terms of IoT data collection and data delivery done without any errors.

This is the reason IoT developers will prefer the programming languages and solutions for building scalable web applications such as C, JavaScript, and Java. A critical factor in IoT development is to send loads of data via desired protocols for data interchange, which includes XMPP for real-time access and AMQP for data sending/receiving.

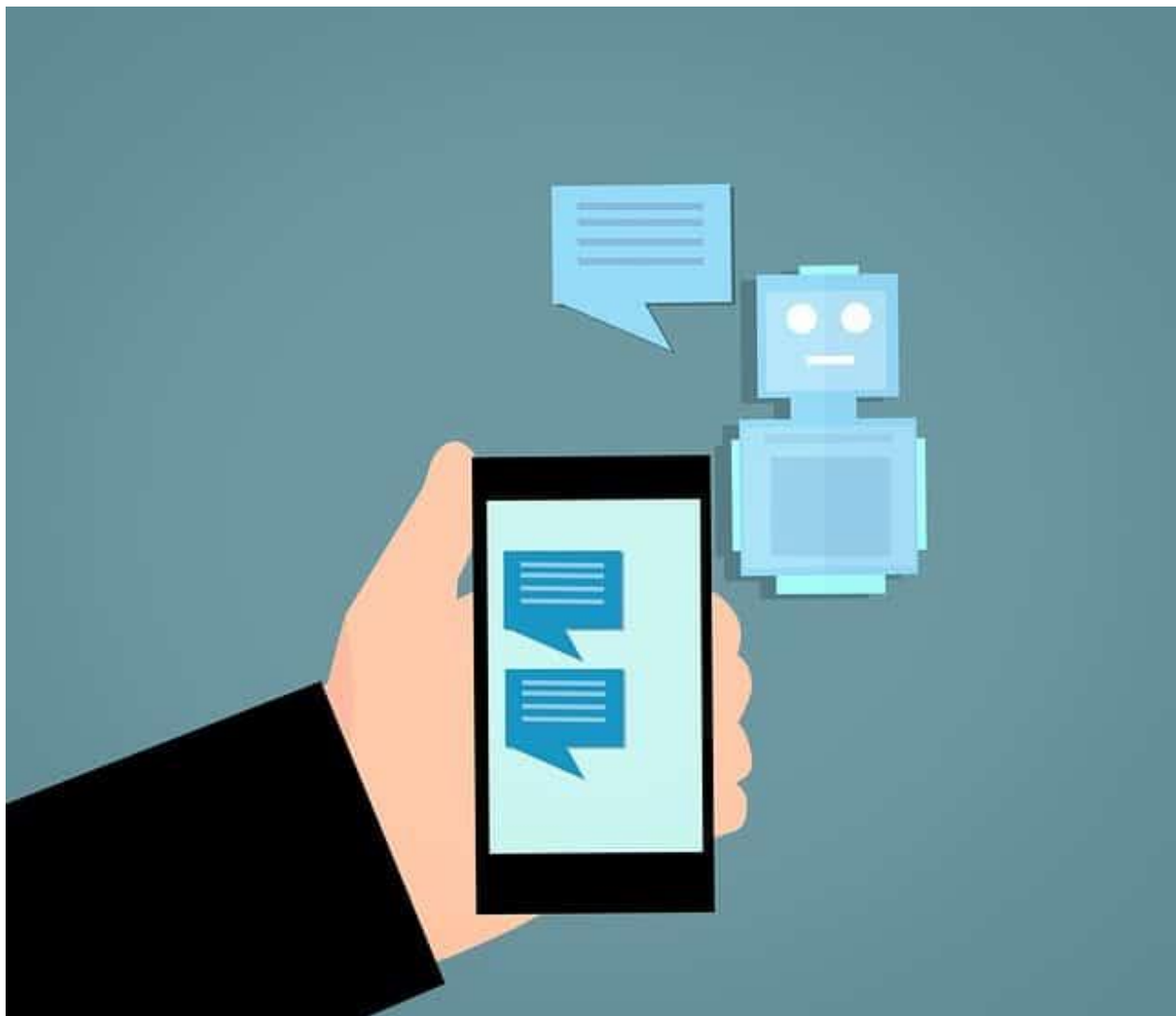
Dynamic UI Experience

Developing an excellent User-Interface is not an easy task, because technology is evolving and we can't expect which one perfectly works on which platform.

But Integrating with IoT is efficient to create UI is very trendy and gives a dynamic experience to the users. It also increases the role of a web developer with the current developing trends. The developers will be able to do A/B split tests in development to pick the trendy one.

Chatbots Integration and Creative User Interactions

Chatbots integration in websites has been increased in the past few years. These chatbots integrate with machine learning algorithms to respond to the queries provided by users without any human intervention. In the future, we are expecting more valuable outcomes by increasing the usage of IoT in web development.



Day by day voice search becomes more powerful in web development. And the search engine giant Google recently released one major algorithm update for websites called

“Florida.” According to this algorithm voice search, integrated websites will rank higher than non-voice ones.

Using IoT in web development enables us to incorporate voice search in websites more effectively. This is one of the edges of IoT in the [Web Development](#) industry.

Live support and Cybersecurity

IoT also offers excellent security, which helps to protect business data as well as user data. Modern websites which include IoT will enable critical identification techniques to understand data misbehavior and achieve security.

According to the [HelpNetSecurity](#), IoT security market is predicted to reach \$52.3 billion by 2026.

IoT is mainly focusing on automation processes, which enable to decrease the human intervention's or eliminate. IoT in web technology is known for simplifying the process of web development and providing useful security.

Insightful support on Mobile Platforms

Internet of Things will give insightful data and can control the devices from remote areas. Utilizing insightful analysis, IoT enables communication with devices and sharing information. Small screen devices like smartphones, fitness bands, AC's, microwave ovens, etc. And all are connected to the Internet, share information, and make human life more productive.

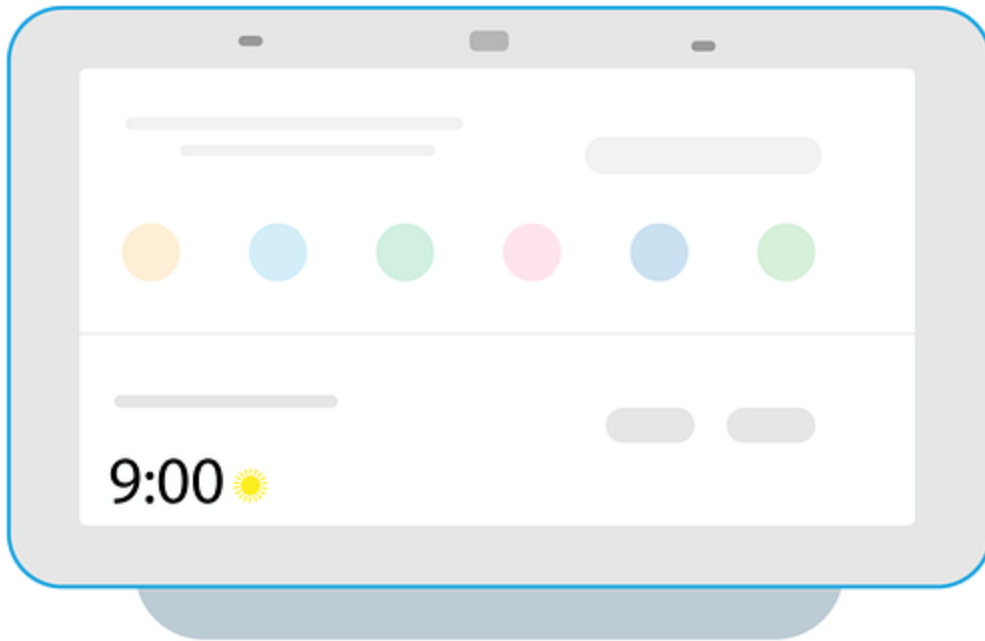
Almost all the IoT integrated devices may be able to display the website results. So let us discuss these devices and how they will impact our daily lives.

Smart Watches: It is a computing and wearable device. It can provide important task results such as displaying the time, calculating the distance you covered, heartbeat, BP, [exercise intensity](#), etc. And displays everything on tiny screens.



Soon, these watches also support web browsers.

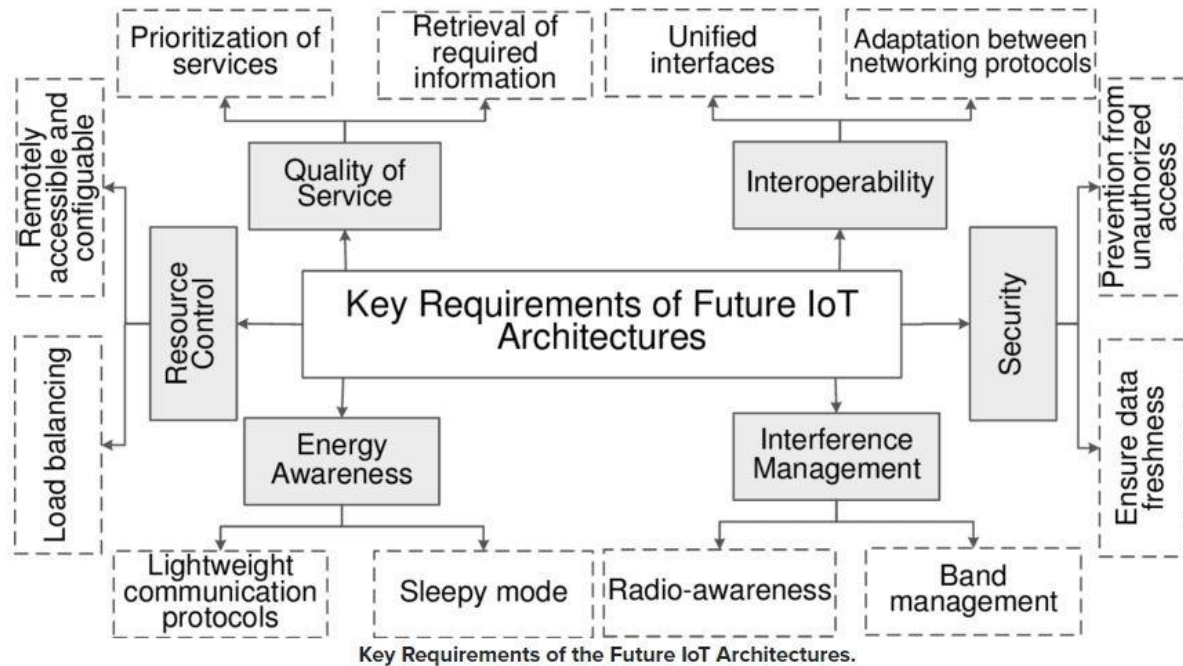
Personal Assistants: Personal Assistant is an emerging trend in the Digital World. It provides result based on the voice assistant. In a market, we have Amazon Alexa, Apple Siri, Microsoft Cortana, and Google's Home, etc. These devices are useful to operate all the accessories like AC's, Microwave Ovens, Fan, Bulb, etc.



All the results have been displayed on small screens.










Impact of IoT Web Development on Various Industries

IoT deployment may be able to change industries like Retail, Healthcare, Transportation, etc. These sectors need modern web applications like in the medical industry to check the heartbeat levels, BP, MRI Scan, number of steps to take, etc. To check the exact location, traffic details, and accident details belong to the Transportation sector.



A modern web application enables to provide an online shopping experience belongs to the Retail sector. So like this, there are different types of categories for which web apps are developed. Currently, app developers using IoT solutions to make web applications to meet client requirements. Check out the below image for more details.

Table 1.2. Potential economic impact of Internet of Things in 2025¹²

		Size in 2025 ¹ \$ billion, adjusted to 2015 dollars	Low estimate	High estimate	Major applications
		Total = \$3.9 trillion–11.1 trillion			
	Human		170	1,590	Monitoring and managing illness, improving wellness
	Home		200	350	Energy management, safety and security, chore automation, usage-based design of appliances
	Retail environments		410	1,160	Automated checkout, layout optimization, smart CRM, in-store personalized promotions, inventory shrinkage prevention
	Offices		70	150	Organizational redesign and worker monitoring, augmented reality for training, energy monitoring, building security
	Factories		1,210	3,700	Operations optimization, predictive maintenance, inventory optimization, health and safety
	Worksites		160	930	Operations optimization, equipment maintenance, health and safety, IoT-enabled R&D
	Vehicles		210	740	Condition-based maintenance, reduced insurance
	Cities		930	1,660	Public safety and health, traffic control, resource management
	Outside		560	850	Logistics routing, autonomous cars and trucks, navigation

¹ Includes sized applications only.
 Note: Numbers may not sum due to rounding.