Contemporary Progression, Agile Applications and Impending Scope of Internet of Things

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Abstract: Internet of Things (IoT) can be defined as a network of physical objects, devices that contain embedded technology (like intelligent sensors, controllers etc.) which can communicate, sense, or interact with internal and external systems. In other words, when objects can sense and communicate, it changes how and where decisions are made, and who makes them and accordingly operations can be carried out. A latest and very fast emerging shift in networking and communications is the Internet of Things. This technology provides an easier way of communication of devices with the minimal interaction of human. IoT takes a leap because of advancement in network interconnections and computing ability to propose fresh techniques. With computation, connectivity, and data storage becoming more advanced there has been an expansion of IoT based application solutions in diversified domains right from health care to public safety, agriculture, from assembly line scheduling to manufacturing and various other technological domains. Different IoT based applications have been explored and possible approach for enhancing the use of this technology have been depicted in this paper. Future directions and suggestions for effectively and efficiently improving the IoT based application areas have been shown. This paper will provide a better insight to carry out research in the field of IoT.

Keywords: Embedded technology, Interconnectedness, Networking, and Computation.

I. INTRODUCTION

The development of an economy depends on the level to which people interact and how they are interconnected with their peer groups This interconnectedness is one of the main factors responsible for the economic activities, which in turn fuels further interconnectedness. The advent of the internet led to the amplification of interconnectedness among people beyond geographical boundaries. This further strengthened the level of economic activities, which increased the volume of production, transactions, income and wealth. However, it is not only people that are getting more interconnected as a result of the internet; products are also being exchanged and things are also getting more interconnected as a result of the internet. This interconnectedness of things is popularly came to be known as internet of things (IoT). IoT simply can be defined as the interconnectedness of physical objects as a result of their ability to sense and communicate by sending and receiving messages among themselves[1]. There are many merits augmented to the IoT. It is focused to facilitate wealth creation and drive economics of resources to minimize waste and promote efficiency, the same way interconnectedness among people fuels economic activities,

increases the volume of transactions and increases wealth. The Internet of Things (IoT) refers to the next generation of Internet which will contain trillions of nodes representing various objects from small ubiquitous sensor devices and handhelds to large web servers and supercomputer clusters. The large scale implementation of Internet of Things devices promises to change aspects of the way we live. For consumers, new Internet of Things products like Internet enabled appliances, home automation components, and energy management devices are moving us a towards a vision of the "smart home", offering more security and energy efficiency.

Other personal Internet of Things devices like wearable fitness, health monitoring devices and network enabled medical devices are transforming the way health care services are delivered[3]. This technology promises to be beneficial for people with disabilities and the elderly, enabling improved levels of independence and quality of life at a reasonable cost.

Internet of Things connects any items with Internet, implements information exchange and communicates through information sensing equipment such as the sensor,

radio frequency identification (RFID) and global positioning system. Internet of Things needs be designed to identify, supervise and monitor items so as that it can provide various types of information services for users innovatively. The Internet of Things has very complex data types, including sensor data, radio frequency identification data, two dimensional code, video data and image data.

II. LITERATURE SURVEY

Business Applications:
A digital network is emerging to support the upcoming digital business and its underlying technology platforms and IT practices. It focuses on people and the Internet of Things (IoT) endpoints. The digital business evolution is exploiting new digital models to align more closely to the physical and digital world for employees, partners and customers. Technology is rooted in everything. Digital technologies such as mobile, social media, smartphones, big data, predictive analytics, and cloud etc are different than the preceding IT-based technologies. Newer technologies touch the customers directly and that interaction creates a source of digital difference that matters to value and revenue[4]. The companies are searching for ways to cut costs while at the same time grow capabilities that are core to their future growth. Traditionally, Technology strategy was viewed as a cost center, however now organizations formulate technology strategy as it acts as enabler of future business success. Technology helps organizations expedite business outcomes with best-in-class cost structures.

Artificial Intelligence & Advanced Machine Learning
Applied AI and machine learning are composed of many technologies and techniques (ex: deep learning, neural networks and natural-language processing [NLP]). These technologies, which are different from traditional algorithms and programs, make the machines intelligent. Gartner predicts that the applied AI advanced machine learning will inspire applications like robots, autonomous vehicles, consumer electronics, virtual personal assistants, and smart advisors. The smart machines are context & event driven. They will be able to deal with complexities, understand, learn, predict, adapt and act anonymously.

Intelligent Apps
Organizations are applying AI and machine-learning techniques to create new apps. Intelligent applications like personal assistants are making our lives easier. Gartner expects that future assistants will be more specialized and equipped with potential to transform the workplaces and homes. Virtual Personal Assistants (VPAs) make tasks easier and users effective by highlighting important information and interactions, virtual customer assistants (VCAs) help in specialized areas like sales and customer service. Packaged app and service providers are increasingly using AI and machine-learning techniques to deliver more robust systems. Over the course of next 10 years, every application, and service will make use of some kind of AI. Artificial Intelligence and Machine Learning is used in intelligent sensors, smart appliances, operational & security applications, smart enterprise apps etc.

Intelligent Things
Intelligent things are the machines that use applied machine learning to interact with the surroundings and people more naturally. Gartner expects that intelligent things like drones, autonomous vehicles and smart appliances will work together in an intelligent and collaborative environment. The autonomous vehicles is used in controlled settings like farming, mining and warehousing etc. Autonomous drones and robots will undergo significant technical evolution powered by new AI and machine-learning models and algorithms. They will be used in defined scenarios and controlled environments. AI and machine learning will increasingly be embedded into everyday things, such as appliances, speakers and hospital equipment etc.

Digital Technology Platforms
They act as a basic building block for a digital business. Gartner has specified 5 major focal points that enable new capabilities and model businesses. These points are
Information system platform — Supports the back office, operations such as ERP, core systems, and associated middleware and development capabilities to deliver solutions[5].
Customer experience platform — Contains the main customer-facing elements, such as customer and citizen portals, multichannel commerce, and customer apps.
Analytics and intelligence platform — Contains information management and analytical capabilities. Data management programs and analytical applications fuel data-driven decision making, and algorithms automate discovery and action.
IoT platform — Connects physical assets for monitoring, optimization, control and monetization. Capabilities include connectivity, analytics, and integration with core and operational technology systems.
Business ecosystem platform — Supports the creation of, and connection to, external ecosystems, marketplaces and communities. API management, control and security are the main elements.
Gartner says that every organization must have a mix of these five factors.
Still, back to the mobile apps. Generally, the most popular ones are the following:
1. educational apps
2. healthcare apps
3. smart apps
4. event apps
5. hotel apps
6. taxi apps
7. restaurant apps
8. travel apps

9. betting apps
Let's consider them one by one.

Educational apps
The features of educational apps depend on the type of the very app. Today, the new trend of educational apps is using the AR or VR technology to enrich the experience. Among the main features of educational apps are:
- Integration with social networks
- planning and scheduling the process of education
- Videos and live streams lessons record
- Surveys and tests
- · Leaderboards availability
- · Multilingual courses
- · Progress tracking and achievements availability

Healthcare apps
There are some new ways of treatment, education and training in this sphere with help of virtual reality. Virtual reality is rapidly entering our lives. Virtual reality is constantly expanding to various medical disciplines. Among others, these are psychotherapy, rehabilitation, practice, surgery, dentistry. Numerous applications become more and more available (iPhone and iWatch) which render the doctors possibility of diagnostic the level of sugar in the blood, respiration rate, exercise heart rates and the level of dehydration[6].

Surgeons can use medical assistance applications to practice operations on 3-dimensional, virtual-reality visual simulations and soft-tissue models that recreate the textures of human tissues. In case of an error no one will die and it will give you the possibility to analyze the fail and try again. This technique of education and training is especially great in cardiac surgery.

Smart apps
Mobile apps recently become very popular and even in great need. Especially smart home apps. People want to control every little thing of their life. And they like everything to be automated: washer, vacuum cleaner, oven, light, heating, door lock, etc. They want to have control upon house security cameras, door and window sensors, smoke detectors and what not. Thus, having remote home control is pretty normal thing. For example, security control may really save you from robbers.

Another interesting thing is smartwatch**.** Imagine that your watch not only indicates the time and date but has a wide range of different functionalities. Just during the past year, Google added more than 5000 new wear apps to the Play Market to make your life easier. As the number of apps is rather great we grouped then basing on their functionalities.

Event Apps
There are mobile apps for creating social events, work events, business meetings, event management and event planning process. And the mobile event app market is already full of hundreds of products of all imaginable kinds. Mobile apps for events help to distribute various tasks: scheduling, registration, booking, notification, recommendation, invitation and even social media.

Transport/ Hotel Apps
Usage of hotel apps is becoming a common thing to most of the tourists. Some key points are:
- Hotel booking via application rise with over 33% for year-to-year growth.
- 65% tourists reserve a hotel room for the same day via booking apps.
- 30% of bookings are made via mobile devices.
  The benefits of hotel apps
- guest gets quick and easy information about hotel services, its surroundings and any relevant thing he want to know.
- users stay in touch with any special offers, discounts and promotions of selected hotels.
- the app provides information about any event that can take place in the hotels.
- comfortable booking may help reserve a room for spontaneous trips.
- integrated payment system allows users to pay for their actions directly via applications.

Taxi apps and various taxi mobile solutions are disrupting markets in many countries. Conventional taxi services are gradually retreating making way to more comfortable mobile services. One of the most popular app is Uber. These are enormous profits considering 40 million people use Uber monthly. Among the merits of Taxi apps are real time location tracking, great booking interface and comfortable payment system[7].

It is believed all of us at least once had a situation when you came home too tired to cook. So you just ordered some tasty pizza and soda or some Chinese food and started watching the next film about the adventures of Harry Potter and his true brave friends.

Now it is understood why restaurant apps are so popular. So the advantages of these are the following:
- better interaction with your clients
- enhanced experience for customers
- more feedback
- an easier way to collect statistics overall
- further automatization = cutting loses

Travel apps provide comprehensive services for your client. With the help of such apps you may easily plan you trip, buy tickets, book a hotel room, monitor weather forecast and other map things, check local transport service, and so on.

III. IMPENDING SCOPE OF IOT
1. Artificial Intelligence Will Be Widely Adopted

363

- Artificial Intelligence (AI) makes a business stand out of the competition and attracts a great deal of attention.
- Businesses, including tech giants, understand that AI is a game-changing technology that can considerably advance a company. According to a survey conducted by Narrative Science, 80% of the polled business and tech leaders believe that AI improves their employees' performance.

2. Value & Usage-Based Pricing is Gaining More Popularity

- Customers truly appreciate pricing that is determined by the value they get from your SaaS solution. The more they use a product, the more they can understand and appreciate its value and are willing to pay.
- Pricing based on value and usage also provides a number of benefits - here you can have a look at it 7 SaaS Trends That Will Change the Way You Run Your SaaS Company in 2017.

3. Everything will be a click away

2017 will be a unique year and all things will be a click away only. Like Uber and Ola which have taken traveling by storm, 2017 will see the evolution of many such ideas and concepts that will revolutionize your world.

4. Smart homes

Your homes will become smart in coming years and the beginning has already been made. Apps are already controlling your home appliances and 2017 will see further evolution in this trend.

5. Physical and Digital interactions

Technology is being added to our lives daily through mobile devices. Every person now has access to smart phone and this generates information on the daily basis for its users. Users can already make purchases through online mode and this year is likely to see new innovations in this category with many new types of services being added to the fold. Technology is an evolution mode and 2017 will bring new opportunities and challenges for those connected to the technology industry. Make the best of it and enjoy your journey in the digital world.

IV. CONCLUSIONS

There will be an improved lifestyle, smart home appliances and devices for consumer use in coming years. IOT in consumer sector will be holding a tendency in offering more personalized experience to customers in retail and shopping segment. Comprehensive home security, smart healthcare devices, smart wearables and applications for tracking devices and people will steer the adoption of IOT in consumer as well as industrial sector.

Definitely in industrial and consumer IOT space, security will remain the foremost concern for start-ups developing IOT applications and devices. Various risks are attached to the security as IOT enabled devices will be saving our personalized data.

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