A probable effect of the development of internet technology on insurance & banking sectors, decision processes and service structures

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ABSTRACT

The history of development of Internet of Things (IoT) covers last twenty years. Despite the short of time, the concept and implementation of Internet of Things have widely spread all over the world. The impetus of dissemination of the concept has exponential speed. In the near future, billions of smart sensors and devices will interact with one another without human intervention. The early impact of Internet of Things has observed and discussed in the areas of technology, transportation, production and marketing. The prospective effect of Internet of Things on finance sector has been discussed recently. In this study, development of concept of Internet of Things and it is effect of to the finance sector and specifically insurance and banking sectors and future expectations have evaluated.

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Introduction

According to a general definition made by International Telecommunications Union the internet of things is the global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies. European Technology Platform defines internet of things as “the information exchange between a mutual network which hosts physical and virtual property having predetermined capabilities and working in smart mediums besides their physical and virtual attributes and other networks and users.”

First studies on the internet of things started in western universities where the infrastructure of information processing and technologies were developed. Under the conditions of those days when internet did not exist, the camera system established by almost 15 academicians in 1991 in Cambridge University sent the image of the coffeepot to the computer screens three times in a minute and took its place in the informatics history as the first example of the “internet of things” due to real-time image.

Following this path-breaking development, in 1999, engineer Kevin Ashton used the concept of internet of things for the first time in his study showing the benefits of radio frequency identification. In the forthcoming years, this concept was rapidly accepted and started to be used around the world as the name of the implementation. Together with the progress of the process, a broad literature started to develop.

The concept of internet of things which is a global system standard based on radio waves and sensors and whose eponym is English engineer, Kevin Ashton and products within the scope of this concept showed a rapid development in the following 2000s.
This paper aims to build a critical approach to the effect of the development of internet technology on insurance & banking sectors, decision processes and service structures.

**The Concept of Internet of Things and its Development Process**

Products developed under the concept of internet of things usually work together with mobile devices and tablets. Each thing has an application which can be reached through mobile and by means of this application things are able to transmit the notifications to the applications. Such applications classified as smart products enable people to manage their home related variations as temperature, humidity and the control of the home appliances through the application while they are in their offices.

The internet of things including but not limited to the internet connection of the devices and information production by sensors and identifiers working with radio waves via some devices is also under the scope of the definition of this concept (Technology Guide, 2013). After the first ten years of the process, information production capacity of the devices connected to the internet of things shows a continuing increase. When things are equipped with the sensor and electronic circuits have gained the special abilities to get in communication with people and to update status information. Together with the development of mobile networks and the internet, things’ communicating with the outer world has become easier and people have had the opportunity to observe and control them.

The evolving role of automated systems and internet technologies in the era of Industry 4.0 will have reflections on the current life on earth will become smarter throughout the development line of (IoT) Internet of Things (Hacioglu & Sevgilioglu, 2019). Some of the applications have already come into our lives. However, with the development of the system, it is expected to pass to a smart life standard especially in such areas as human health, transportation, communication and urbanization. In this case, expected developments will trigger other developments in some other areas and a chain reaction will take place.

According to the studies conducted, it is forecasted that 10-11 billion devices are connected and predicted that this number will rise to 50 billion-device-level in 2020. According to the same studies, while the ratio of interconnected device per person is 0.08 in 2003 on the world, forecast of the same ration for 2020 is “6.48”. Besides, in 2020, it is predicted that the information traffic which will be produced by 20 typical home appliances will be much more than the internet traffic produced in 2008. After the internet technology has been put into practice, a lot of significant phases have been gone through. In order for things to connect to the internet medium and form the information infrastructure by means of communicating through a mutual network, internet has to reach a specific point in this development process.

The first phase of the internet can be named as research period and this period is the introduction phase which was dominated by the networks with researching aims having extensive usage only in academic circles.

![Figure 1 & 2: Increase in Internet connected devices by years; Source: Cisco Internet Business Solutions Group](image)

The second phase covers the process which companies and institutions make briefing about their activities through the internet. The second phase can be defined as a period of time which is table and dominated by the one-sided briefing and the effort to transfer of one-sided information to the masses.

Third phase is period where the internet proceeded to interactivity far from being stable, real-time purchasing transactions of products and services provided were performed, presentation to the large masses were enabled by means of prevailing in infrastructure facilities and mass marketing implementations started to become widespread. Last phase means the development period in which we currently live today and means a process where the concept of social media has become widespread.
When we look at the process from broader perspective, by means of the classification to be made, Web 1.0 can be used to define the first two phases. Web 2.0 can consist of the third and fourth phases in terms of the content abundance which is developed by the social media and the user. For this reason, Web 3.0, semantic web and ultimately Web 4.0 can be entitled as the process of internet of things. These sequence numbers stating the phases of the internet should not be regarded as processes which start as soon as another one finishes, on the contrary, they should be interpreted as the interpenetrated rings of a chain.

The phases where internet of things has become into a network which directs the technical applications in many industries and in many phases of life has required the simultaneous management of many interpenetrated processes. As it can be seen in the graph, technology, RE-DE and innovation management operated in a simultaneous and integrated way during the processes of system formation and maturation.

In terms of market environment, it is observed that the implementation of internet of things brought solutions in five different areas. These areas are classified as smart clothes, smart houses, smart cities, smart environment and smart enterprises. Among the solutions for the market environment, one of the most important concrete implementations which reflect into the consumer lives is the shared internet of things. In recent years, sharing economy appears as a rapidly rising new economic model. Business models such as instrument and furniture sharing within the scope of social innovation appear as new application forms of sharing economy, where studies related to internet of things are conducted. When consumer trends have been examined, shared internet of things which is the next stage of internet of things takes place among the rising trends. When we take a look to the speed of shared internet of things application trend, it is expected to be much more included in the consumer preferences in upcoming years. An important example of business model related to the shared things is the implementation of vehicle sharing which was initiated by the big car-making companies firstly in Switzerland. In this model, 4-5 people who share the same purpose can rent an automobile model up to two years and can pay the rent amount as a monthly fixed amount and usage based model.

The system of shared internet of things provides the users with the opportunity of following the location of the shared thing at that time and its availability for use by means of an application adapted to the mobile phones of the users.

With the help of shared internet of things, efficiency in source utilization is enabled and in terms of consumers, benefit maximization in a much higher level is attained with limited budgets.

**Impact Areas in the Insurance Industry and Expected Developments**

In the study of technologies that will change the world in ten years by Dave Evans who is one of the well-known authorities in technology literature, internet of things takes place on the top. Study states that in the current phase of technology a trend is entered into where the number of things can connect to the internet will be much more than the number of people and the number of things which can connect to the internet will surpass 50 billion before 2020.
While the concept of internet of things and the applications formed around this concept are gaining speed, in first stages, it was not expected that finance industry would be the area of successful implementations in this area. However, throughout the development line of internet of things, finance industry has gained a major momentum in terms of current practices and expectations for the future. As of the reached phase, current and expected impacts of internet of things on finance industry is expected to show a momentum which will directly impact the insurance and banking industry practices in future years.

In future years, smart thermostats, integrated security systems, smart fridges and cooling systems and wearable fitness devices which are expected to become more widespread in the area of internet of things will add new dimensions which will shape the services of insurance companies. The implementation of internet of things is expected to change the traditional practices in the insurance industry in a radical way. For a home owner who can keep the lightening, cooling and heating systems and other electronic devices of his house under control by means of a mobile application it will not be possible for the insurance company to draw an elemental branch insurance in traditional sense. In the new environment which such a data flow will create, policy pricing of the insurance companies will be much more different and the possibility of a more efficient pricing compared to traditional methods will increase accordingly, since the insurance company will be able to obtain much more detailed information about the real estate subject to insurance.

Household insurance policy which can be drawn for an insured party who is under the protection against such general risks as fire, flood and burglary will have to be designed in a totally different way. For this reason, insurance companies which can cover the data requirement of actuarial calculations to be resulted from this new situation in advance and which can perform the pricing and underwriting procedures in a successful way will get ahead in the competition.

In the medium of internet of things, while 23 million cars were followed in 2013 all over the world, this is expected to reach 152 million cars in 2020. Route records of automobiles followed and drivers are kept in this medium. In this way, information about the drivers’ driving styles can be produced on driver basis from the data pool which is formed. At the end of this process, the possibility of driver basis and usage based policy assignment and policy premium determination in parallel with the customer exposure appears. From today’s projection, in implementation of internet of things, accident risk will completely disappear in an environment where all automobiles can communicate with each other. This case will create a brand new environment for insurance industry and especially automobile risk insurances will have to be redefined.

On the other hand, in the case of earthquake, tsunami and nuclear plant accidents which are classified as catastrophic risks in insurance practices, level of development of internet of things gains prominence in the case of informing the public and creating awareness before the risk realization and managing of the risk when it realizes. In this respect, an impressive example was experienced in Japan. After the nuclear plant disaster people could have the information about the radiation level all over Japan by means of Geiger counter’s connecting to internet and under the light of this information they did not travel to regions where the radiation level was high or they were moved away from such regions bearing radiation risk.

In the environment of internet of things formalized by the Geiger counter and internet network, Japan people obtained maximum protection against the impacts of nuclear disaster in short period and were able to manage the negative effects to some extent that can be created on the human health in the long period.

Expectations from the internet of things in the area of health insurances are in a more path-breaking level. Health insurance policy owners’ blood pressure values and figures of calorie burning as a result of daily activities will be collected by the internet of things which communicate with the insurance company’s computers and stored in the mega system. Thus, critical values related to the health of the insureds will be under continuous monitor and next year their renewal policies will be priced according to the development of the collected data.

World population is continuously getting older. In the middle of the century, it is predicted that there will be one billion people in the class of humans above 65 years old and do not work. Internet of things can present life quality increasing solutions for the people in this age group. A portable device which is connected to the system can readily send the health parameters of people in this age group to the health institutions and insurance companies. In this way, both health institutions and insurance companies can have the opportunity of taking preventive measures and offering solutions.

**Impact Areas in the Banking Industry and Expected Developments**

Banks, with the innovations provided by the process of internet of things in their activities will take on new roles in their services which they present to their customers. Traditionally, in addition to a bank’s providing its customer with consultancy service for its customers’ financial needs and managing the accounts of the customers, consultancy roles will gain different dimensions in the process of internet of things and banks can produce solutions for their customers’ non-financial needs. An individual banking consultant who continuously collects data from the fridge, electrical counter or automobile of his customers will also attain the ability of continuously monitoring the budget status of his customer.

He can forecast certain expenses which can potentially arise in the budget of the customer and even he can give preventive advices. The fact that internet of things take place in individual banking activities will gain brand new dimensions to the current banking business.
In respect of commercial banking, it is observed that changes that will occur together with the development of internet of things will show more dramatic and radical development when they are compared to traditional practices. Because the banks will have more information about their commercial customers, starting from their supply and production chain, they can simultaneously analyze a wide range of information from the dynamics of the companies with whom they compete and the distribution network of the end product to the consumer preferences and submit the results of these analyses to their customers. In traditional commercial banking, while banks ask their commercial customers to submit their financial statements at the end of each period and then they analyze, in banking practices which will be created by the internet of things, banks will direct and manage the statement formalization processes together with the customers. In banking practices dominated by internet of things, in order for the banks to render a successful operation, it will be required that they become able to divert a huge data flood and produce information according to the needs of their customers by processing these data. For this reason, it appears as a necessity for banks to make big amounted investment on the information technologies infrastructure.

In banking practices, by moving away today’s standard understanding of product and service, product and service implementation which is designed in a complete alignment with the customer needs will be initiated. In parallel with this, pricing process will be realized within the framework of a dynamic model. Since banks will have the finest detailed information about their customers such as their habits, lifestyles etc. products and services will take shape in line with the specific customer needs.

Together with the prevalence of internet of things, banks will have to change over from traditional risk management to digital risk management approach. Banks’ collecting more data will require more data capacity and this will bring the necessity of producing more information.

**Conclusion**

In order for the institutions in the finance industry to survive in the future, it is required that they should be susceptible to financial innovations and they should always have active reflexes to shape the future. It is expected that service expectation of the future generations from financial institutions, especially the generation called as Y generation today, will be more of technology-weighted. Financial institutions, while developing products and services in line with the expectations of the new consumer appeared in the axis of changed investor behaviors and market trends, should take into consideration that financial product function of the future should simultaneously evaluate the social and environmental impacts in addition to the profitability. Potential implementation of the concept of internet of things in finance industry, which constitute the essence of this study and the expected developments, will radically affect the industrial dynamics of finance industry within next twenty years. In the insurance and banking industry, presenting the customer-based solutions and products and performance follow-up will become possible with implementing internet of things with all its practices.

In the environment of internet of things, in the insurance industry policy to be designed for the insured party who asks insurance service with the purpose of being protected against risks in both elemental and life branches will have to be designed in a totally different way. For this reason, insurance companies which can cover the data requirement of actuarial calculations to be resulted from this new situation in advance and which can perform the pricing and underwriting procedures in a successful way will get ahead in the competition.

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It is a known fact that finance industry takes technologic solutions more readily than the real industry and reflects these into the customer-based solutions. Together with the development of internet of things, solutions to become concrete will find an implementation area in international dimensions. For this reason, it is considered that insurance companies and the banks which operate locally will lose their competitive aspects considerably if they do not make the required investments of the system on time and in the long term they may face the risk of withdrawing from the industry.

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