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Article

Apracadabra application platform for intelligent and immediate-services based IoT technology

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Abstract

Apracadabra application platform visions are to connect multi types of technologies: RFID, sensors, actuators, person's users etc., the opportunity of bring out the IoT technology into reality became possible at the present through the integration of many available technologies, especially in the under development countries (not high infrastructure). The IoT provides many important features, which transformed the internet from communicating with people to the possibility communicating between things "smart devices" to do queries, surveillance and other smart services.

Due to high cost on attaching a sensors or RFID card in some services or providers we propose Apracadabra, Smart Services to contribute on developing societies, would be unable to jump suddenly to the accurate IoT technology concept.

This paper address Apracadabra application platform to be the right solution for under development countries to provide same services as IoT in terms of speed, we can call it the first generation of the IoT. Apracadabra based on attaching an account number or IP address for each user (server - clients), is the services provided by this user will be presented to other interests with the possibility of evaluating those services by the beneficiaries, this platform gives the user's location and all available ways of communicating.

Apracadabra Smart Services (ASS) name came from aladeen Arabic story (Shobic Lubic (شبيك لبيك) or Apracadabra) which means helping others or clients to get whatever they need immediately, it is a mobile devices application running on Android system due to android system widespread and characterized by many features, also we can access Apracadabra through any web browsers.

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1. Introduction

Internet of Things (IoT) is a novel become very important in modern wireless telecommunications. The concept of IoT based on variety of things or objects such as Radio Frequency Identification(FRID) tags, Sensors, mobile phones, actuators, etc. all this device are able to communicate through unique addressing scheme, which allow them to interact with each other, also provide services to all neighbor's nodes to reach common goals [1].

The First information revolution was the computer in starting from 1940, and internet also counted as second revolution, and now IoT is third revolution of information, Currently, the culture of Internet of Things industry has gained high attention over the world, many of high infrastructure countries look to IoT as new strategic industries and new economic growth engines and sensationally start running IoT in many business field like Amazon.

What is the meaning of unique addressing of objects? the addressing or IP addressing is the way of given ID for each device to allow it to exchange information, but having unique IP is big challenges in this third Generation which called ''Semantic oriented", perspective of IoT.

We have three new concepts: things-oriented, internet-oriented and Semantic-oriented technologies and standards, so IoT become the central role in all above mention technologies, as illustrated in Figure 1 [2].

The terms Internet of Things(IoT) derived from Things Oriented for words 'things', thus IoT means Auto-ID [3].

2. Architecture of Apracadabra

The proposed application platform main advantages are the availability to connect many technologies interface, Service Oriented Architecture(SOA) is best software layer architecture proposed for the new growth IoT technology we call it Middle-ware, which consist of five layers, ordered from top to down: application, services composition, service management, object abstraction and the lowest one is the objects itself as illustrated in Figure 2.

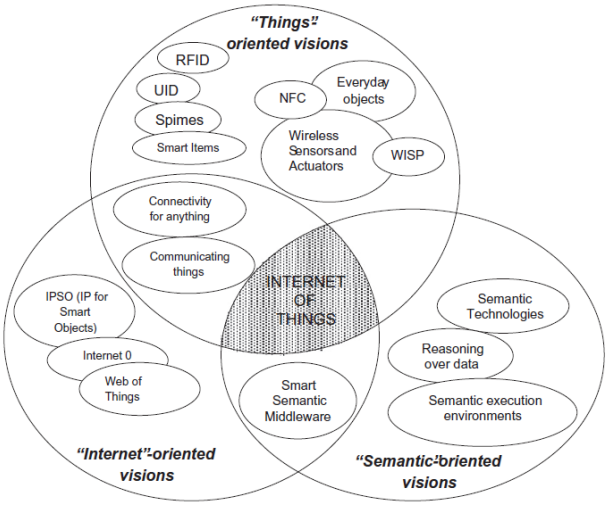

Figure 1. The IoT paradigms [2].

Apracadabra application platform visions are to connect multi types of technologies: RFID, sensors [6], actuators, person's users etc., all these can represent a Units to be connected to could internet(if the services providers wants to connect all items using RFID tags and adopts a RFID reader in his stores then the clients can directly communicate with the item through a middleware), in the RFID tags we can insert all information in concern like price, model, type and size about the items, the RFID reader will work as a middleware between the tag and internet then to the far end or clients. In the sensors case: The Base Station(BS) can work as a middleware to help users or client to collect information from different monitoring environments, on the client side the users can search or access the services application interface from android smart phone or even through any web browser such (IE).

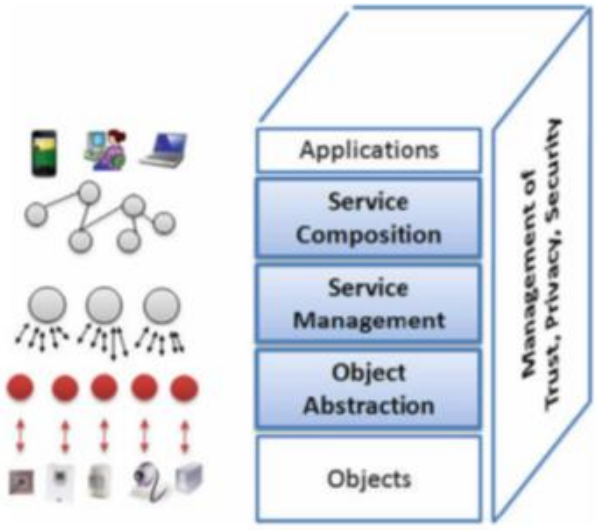

Figure 2. Apracadabra application platform architecture [3,5].

3. Application Vision

To understand how the application work let consider a customer driving his car on a road connecting two cities and suddenly got drive failure and perhaps by utilizing his simple experience he can determine the failure type. All what he needs to do is open mobile phone and insert the type of problem he got in his car on Apracadabra application platform interface. it immediately processes his order and guide him to the nearest car mechanic which he is specialist in this type of failure, as well as through the GPS it can determine the mechanic location, distance and provide all contact information about him. The mentioned example is one of the online services provided by the Apracadabra, in searching process this application depends on the distance between the service requester (client-customer) and the service provider(saller) to show the results as in Nearest First(NF) concept.

The service provider shop has RFID reader that connects the shop online via the internet to allow the client to search for tools or a particular service. when the client searching about this particular service, through the coming results the costumer can identify the service or item in details and he can buy them through his connected bank account and the Apracadabra uses semantic search as essential benefit as in Figure 2. to show the full relationship between both internet, semantic search and the IoT. Therefore, we conclude that our research is a good example of the desired integration between the three significant techniques and this is one of the most important Apracadabra application platform features.

One of the important aspect of Apracadabra application platform is how can a customer ask for service and how the service provider response and deliver service to him, on other word how/what is the transaction architecture between the two sides (customers- providers)? To answer this question, we find that the appropriate architecture for Apracadabra on the 3rd world countries is to use (customer- internet could-service provider) because the application developer's future plan to cover different types of services, and it can be extended day by day (whenever new service has been added thus new class will be added too).

The steps of requesting or searching for services as following: a) opening the mobile or any smart phone, which must be connected to internet, b) opening Abracadabra main interface and login in with the customers User name, c) typing the name of the service or products on the textbox then he can choose the class or department which the service belong to, or even without choosing it the application will automatically search on all services classes same as famous searching engines like google. d) after pressing search button the results will be listed directly, we mentioned above that Abracadabra application platform differ from other application in searching results which is sorted in Abracadabra on Nearest-First(NF) principle, also the results come according to rate feedback from previous

benefited customers. e) The customer can request one or more product or service (also he can view more detail about such services). f) If the customer wants to contact the service provider he can do that using any social media or even they can use video conferencing.

For easily publishing and spreading the application we plan to link it with some famous application like WhatsApp, WeChat according location user preferring application, we expecting the application will get high popularity in very short time because of its benefits and usability to everyone, in case of willing any user(store-market- engineer etc..) to advertise any new service he can do it in very easy way though Apracadabra application platform by writing all important information in detail about this service so the application can deliver it to all customers any different ways: a) a new notification bob up in users(who is in interest) in their main page of the application, when he click it he can open new page, in that page he can view all information or data about the promotions, or new services or products etc.. b) The also application had the ability to analyses the data in any (shop- services providers) from transaction record for example to know which customers is interesting to which services, thus the application automatically shows up any news about such service, this is one of data mining aspects, as we mentioned above that one of the most IoT advantages is connecting many technologies together to provide many services and to minimize the cost and efforts.

3.1. Communication types

As we mentioned above Abracadabra application for intelligent services is in the first version, we aim to deploy the fully IoT technology in the 3rd words countries which need such services very urgent, the application also as it have different working architectures with many communicating interfaces it can be also useful in 1st and 2nd word countries, so we can call it a real IoT technology, Apracadabra have communicating types:

1. Clients- Service Providers communicating: it means services requesters and providers, or human to human.
2. Clients- Services communicating: it means directly connecting a services requesters and products in case of attaching a RFID rag or sensors on the products.

In all cases we can successfully got an excellent results and best services finder based on IoT, whatever these services were buying a goods (online shopping) or an urgent service for customers like searching for care mechanics.

Apracadabra also can directly communicate with the services, products and tools through RFID technology or any collecting data interface, the service provider can set a RFID sticker in the tools or products that service provider need to sell and he can insert and attach all information about this tool inside the Card such as name, model, type, country, price and other concern information for client.

- App back bone: as it's the first version of Apracadabra application its working based on the internet and it use any famous chatting application like Facebook messenger or WhatsApp for connecting the services provider with any client or customers through Apracadabra servers, thus they can communicate and try to get more clarify from services providers, thus our application use a social media just from communicating between two sides (service owner or provider and service requester or client).
- App work flow: Apracadabra application based on U2U architecture and NF (Nearest-First), so when the customer search for any service or products the results will be showed in his screen is based on NF.

3.2. Location detection

The application also has the ability to detect the location for both services and customers through the following:

- When adding new products or new services the person who enter the data can insert the location of his business or market (in case of having fixed location).
- In case of car mechanics or the services provider doesn't have an exact place the application can detect the location of customer or providers based on GPS, thus we can know the distance between them.

4. IoT phase (1)

At first glance, you may see that this application does not use the full methodology of IoT, you may see that this application does not use Internet of Things technology stuff full communicating methodology. However, it contributes and provides a quick and speedy service for those interested in the search for a goods or service and communicate with those who provide this service, thus Apracadabra provides better things or customers communicating all this contribute in fast easy immediate services.

Therefore, this application is very useful in emergency cases, it's based on the number of users i.e. the system working efficiently when it has a large number of users and service providers. Thus, both Apracadabra users works as a server and client at the same time i.e. if the service providers have products can be provided to clients. he need to enter all information about it if client wants the request this product he will search about it, he will get all that information and he can contact with the service provider, in Figure 3. there is chat button allow the two side to chat with each other.

The ASS allows us to also many ways of communication between the clients and service providers such as direct contact with the instant messaging, audio or video call. And through visual communication clarifies or review the type of service or car failure (as the previous example), or through SMS services.

The Apracadabra application is a Users2Units (U2U) with the opportunity to learn more details about services. This research seeks to utilize IoT system and enables users to find out the location and additional information about the emergency services which they are seeking.

One of the most important success factor on developing this technology and success in order working as real IoT is that the seller enter detailed, accurate information about the available various products, he can also enter additional information about available quantity and price, specifications and the more detailed. Whenever information is accurate the Apracadabra has opportunity to bring more customers, and also saves a lot of effort for those wishing to inquire about the commodity given the current possibilities, we see such an application was considered sufficient, we can call it the initial release phase (1) of the IoT.

Application service types: this application has unlimited service areas so can we call it Unlimited Things Communicating (UTC) thus the database developed to cover all services that we need or want to query or to display to customers so this application can be also help the Hyper Market in easily products advertisement's, but it focuses more on the style of the NFFS concept and its one of the most searching results. This application differs from normal searching sites, its more focused on providing services in the range within a city or smaller than a city (as in the previous example), this does not mean that the application not display the results located in other cities or countries, but as we mentioned earlier it focuses on the principle of Nearest First-Fastest Service (NFFS).

ASS users as mentioned can be a service provider represents many products or services such as (vehicles spare parts with many products and tools) and therefore every item needs to have a unique tag, in FRID case the service provider need it insert all concerned information or characteristics about the item inside the tag.

The other type is also the client (Mechanical Engineer) and thus will need a unique address or user name to represent him, so he can write in detail what kind of failure he has fluent experience to fix and repair it.

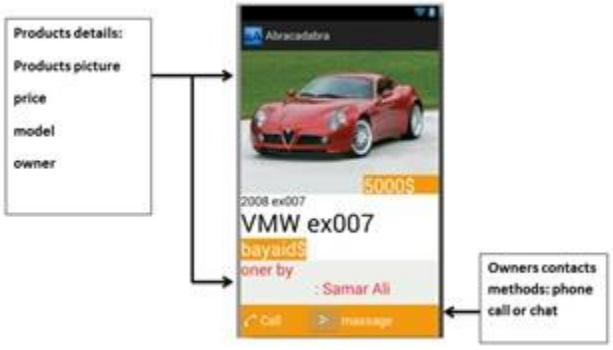

Figure 3. Products detail view and customer/ provider communicating.

5. Apracadabra interfaces

Adding new products or new services can be done in two main ways:

1. Connecting the products directly through RFID tag or sensor node: this type almost IoT technology, the service provider can just place the RFID tag on all products in his markets and insert all information about the product into the tags.
2. Connecting all products which the service providers want offer it to the customers by provider User name or his Account, then under his account he can list all service he offers with correct name and detailed information to allow the customer easily found it when they search. Here we would like to mention the market owner or service providers usually have not enough skills to insert the products information
3. thus he can ask for help from one of application developers or any experts.

This application also provides an immediate advertisement services for all users and customers as fallowing: immediate publicity and advertising process for all interested (if the service provider need to make an announcement about a particular services or any hyper markets make a discount for some products), the application provides notice to all interested in that service and certainly their location, so all clients can see a pop up in his home screen about new products as illustrated in the Figure 4.

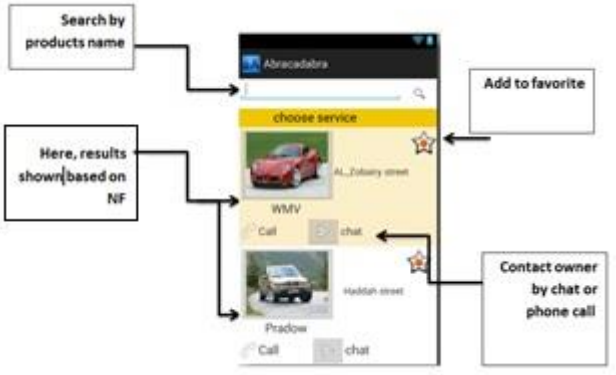

Figure 4. Searching result and Apracadabra options.

It's important for any user or client to mention his interests(whatever its products or services), from users interest, thus the application performance will be improved, so when any Hyper Market have new products, promotion or any service provider have new services want to advertise it to the customers(users) they can easily inserts it as new (services or products) as illustrated in Figure 5, when any client open the application in his mobile he can see every new adds as bob up in to top of the screen, this option it's very important especially for small business, it can help them to get more and more customers so their business will grow up faster with cost lower than any other advertising media.

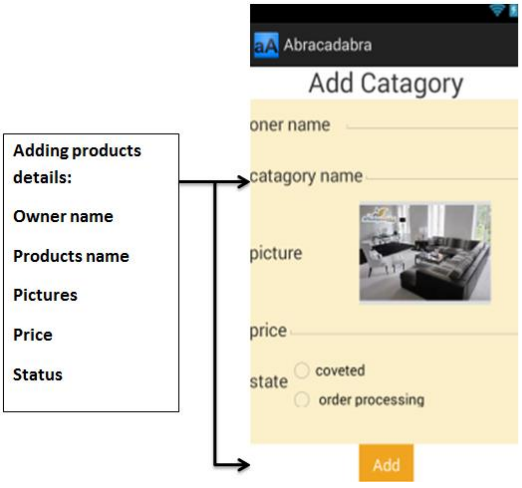

Figure 5. Adding new service or products.

6. Presentation and evaluation

Any user (customer- service providers) have unique account, through this account he can show all services he can offer it to other customers, also he can add new service or new products, thus all this services will be allowed for any customer to view it, also all users have their own page contain all transaction record they already done!

All customer or service benefiter can evaluate this service after they buy it or use it by two ways:

1. Through direct evaluation from customers who utilize this service, but we all know most of customers didn't come back to make evaluation for the goods or service they buy thus we can go to second way,
2. The application has the ability of limitation all customer who buy or use this service thus from knowledge base the application can evaluate this service. The service which has most positive evaluation rates will get high rank thus it will be in the top of searching results for customers.

This article focus on smart services containing (smart marketing, smart advertisement, easier and smooth communicating in emergency cases etc.), on another word how this application can help us to find anything we are looking for immediately.

7. Conclusions

Apracadabra application visions are to connect multi types of technologies: RFID, sensors, actuators, person's users etc.., the opportunity of bring out the IoT technology into reality became possible at the

present through the integration of many available technologies, especially in the developing countries, because it doesn't need high infrastructure.

The ASS contributes on enabling users to find out stuff that they are looking for, and provides sufficient and accurate information about products, tools and services they immediate needed with detailed information about it such as location, contact information, and direct contact with providers or even with these stuffs. From the previous section we view the main interface and the application vision, we evaluate the service provided by app and how it can directly link the customers to services which its urgent to him.

In the future we plan to cover different types of services, and it can be extended day by day whenever new service has been added. Thus, new classes will be added too, also we plan to develop the 2nd phase to Apracadabra.

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