

DATA MODELLING FOR SW-COMMERCE CONCEPT

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Abstract

This paper describes the Data Model of a new concept which is Smart Watch Commerce (SW-Commerce), modelling this concept is to make transactions Selling\Buying much easier and faster through the use of smart watches because they are easy to use and always available with the customer. The concept SW-Commerce in this paper shows that in near future most of customers will use it for transactions, in other hand the benefit of smart watch is that user can be up to date with new notifications about his goods.

Keywords: *E-Commerce, Software Engineering and SW-Commerce*

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I.Introduction

Recently; technology has a very significant and vital role in improving the quality of services provided by the business. Data, information, Knowledge and Wisdom revolution in the society is brought by the most used technology which is Internet Technology and it is listed as third rank wave after agricultural and industrial revolution. Today E-Commerce is the latest and cutting edge for business and transactions for any type of goods. Internet is used Almost by everyone in world for a lot of reasons and they are growing in numbers, this growth provided the facilities for global and regional E-commerce. However, with Internet various properties of the public and local environment; infrastructural and society have created an important stage of variation in the acceptance and growth of E-commerce in different places of the world. E-commerce has some effects they already appear in all areas of business and transactions from customer service to new product design to companies.

II.E-Commerce & M-Commerce

Devendra *et. al.*, (2012) defined that electronic commerce, commonly known as e-commerce or eCommerce, consists of the buying and selling of products or services over electronic system such as internet and other computer network [1].

We can define E-Commerce basically as the use of computers which are connected via network to buy and sell goods, enhance the performance of organizations, acquire market share, gain more profits, deliver products faster and improve customer services all that through Internet.



Fig. 1 E-Commerce Process

As shown above in figure 1 which depicts the process of E-Commerce transactions (Buying\Selling); as known any transaction process needs a company, Customer and goods but transactions now are converted to Electronic transactions so some additional requirements and processes will be added to the life cycle of any transaction, in E-Commerce we need also a customer and company, the order for an item is done via World Wide Web (Internet) by surfing many websites such as : *Amazon, EBay, Auto traders* and *Made-in-China.com* when he\she finds a product a comparative between a lot of items can be done before buying after the customer is satisfied with the product then add it to cart, an E-form is shown to be filled with information about the customer and payment methods, after completion E-Notification will be received then a few days later the customer will deliver his item. Everything is done very easily from your office, home or outside we just need internet and computers or mobiles.

Usually when using any method in different fields there is always an advantages and disadvantages, therefore the list below will mention the most common points when using E-Commerce [3][4].

- Advantage of E-Commerce:

- 1- Saving Time; there is a lot of processes that saves time such as: using E-Commerce everywhere and anytime, no need to stand in a queue anymore and accessing the stores is very easy and doesn't take time.

- 2- Comparison; the customer can search many websites for finding the lowest price of an item to buy.
 - 3- Cost Effective; E-Commerce process needs few of employees therefore it reduces employee cost.
 - 4- Economy Benefits; there is no need for physical repositories to advertise or show the product to the customer.
 - 5- Availability; the customer can buy/sell items at any time because E-Commerce websites are available 24/7.
- Disadvantages of E-Commerce:
- 1- Security; a very important topic is security of payment process, in means that a hacker could steal the customer's money through lack of security in E-Commerce transaction.
 - 2- Fraud; the customer is always worried about his personal information to be misused by thefts.
 - 3- Unofficial website (Fake); it effects badly on E-commerce and its development.
 - 4- Product Quality; there are no exact information about quality of the product because they are untouchable and we don't know the condition of used items.
 - 5- Bargaining; the customer is not able to bargain with companies (Sellers).
 - 6- Shipping cost; online order will increase the shipment cost and fees.
 - 7- Satisfaction; there is no interaction (lack) between seller and customer, so the procedure of convincing the customer to buy a product doesn't exist anymore which has a negative impact on E-Commerce.

M-Commerce is defined as, the emerging set of applications and services that people can access and surf into websites from their Internet-enabled mobile devices. Typically, M-Commerce takes place in a strategic platform called a "mobile portal" [2].

In 2016 most of Iraqi adults holds smartphones using them at most to access internet and they prefer it as the primary device to surf websites. Therefore, it will be the optimal device to make E-transactions (Buy\Sell) via the most popular application *Facebook* or other websites (Amazon, eBay, etc.) So a mobile transaction is one where the Customer presses the buy or add to Cart button in the mobile application used by customer, figure 2 shows the growth of mobile purchases.

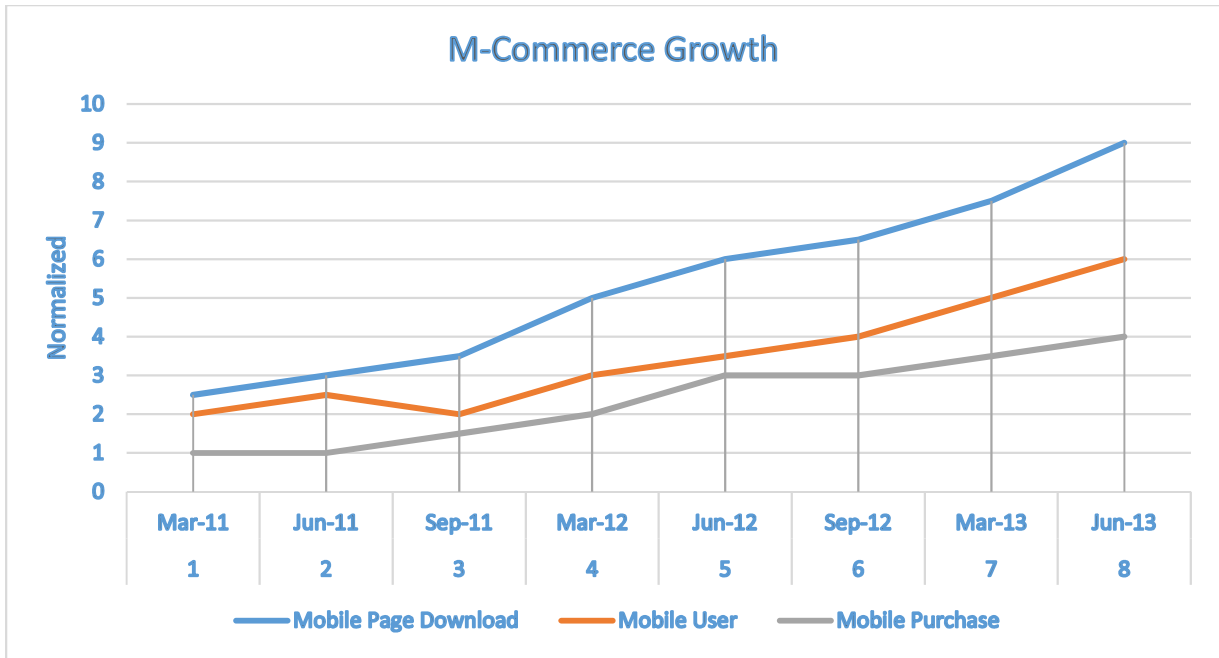


Fig. 2 M-Commerce Growth

Figure 2 plots three variables in a monthly time series: mobile purchase, mobile user and mobile page download. The mobile purchase represents the purchases using a mobile application. Mobile user is the share of all users making a purchase in a given month who had made a mobile purchase in or prior to that month. Page download is the ratio for the number of mobile page downloads and the total number of websites pages' downloads [6].

III. Smart Watch Commerce (SW-Commerce)

As technology develops and grows up rapidly day after day, a lot of new devices will rise to make communications, business, education and life easier and friendly to manage and facilitate. Therefore; after inventing tablet, smart phone, laptop, etc. recently a new mobile device was invented called “Smart Watch”.

Definition: A computing device with functionality beyond time monitoring use (like: Mobile Apps, Camera, Bluetooth, etc.) which is worn on a user's wrist.

Types of Smart Watch:

- 1- SWSP-Commerce (Smart Watch-Smart Phone Commerce): the SWSP-Commerce type needs a smart phone to operate because it uses the Bluetooth technology to be connected as a pair with the smart phone, the benefit is saves time and effort, but it is also connected to another device such as “Smart Phone” that's why it's not preferred to be used in transactions because the use of smart phones will be easier for transactions than smart watch.
- 2- SW-Commerce (Smart Watch Commerce): the SW-Commerce is a type that doesn't need to connect to another device due to its new technology, options and facilities. The benefits

are that user can be updated with new notifications always, light weighted, no pocket its warn on wrist which makes it easier to communicate. Therefore, this kind of Smart Watches (SW) is preferred to be used.

- **Modelling SW-Commerce:**

Software Engineering framework activities as shown in figure 3 (Communication, Planning, Modelling, Construction and Deployment) they are applied in this concept from communication to Modelling.

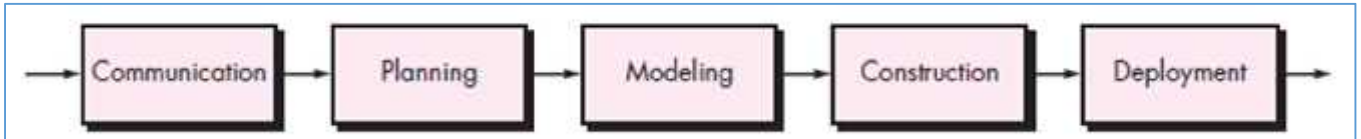


Fig. 3 The Process Model Flow (Linear)

To model any system or concept there are some requirements and procedures need to be considered in the design diagram these requirements are Model Component and Model Steps, a list below shows the components [5]:

- 1- Entity; every software designer needs information about the business or company objects, in the concept survey of this paper the term CUSTOMER is an entity which contains all the customers in the organization with their data.
- 2- Attributes; each entity has a different attribute, let me consider another entity from the concept such as PRODUCT entity which represents set of all products every item has a different or specific attribute(characteristics) like (product No., product Name).
- 3- Identifier; to distinguish between all the products in the PRODUCT entity one of the attributes should be assigned as an identifier and the preferred is the one that holds Numbers such as (Product No.).
- 4- Relationship; let me consider the entities CUSTOMER and PAYMENT they are two separated objects with their own characteristics. In order to make a payment the customer needs information about the payment method and vice versa, both of them need to be related with INTERNET therefore setting a relationship between objects are very important because it shows how the procedures will be managed.

- Modelling Steps:

A. Identify Concept Entities; this Business process will contain data about Entities in this concept they are shown as following:

- 1- Identify CUSTOMER; important data is needed here to perform the process like: (Name, No., Address, etc.).
- 2- Select Technology; is a must to complete the business process mentioned in the concept such as: (Cell Phones, SW, Laptop, Tablet and PC).
- 3- Assign PRODUCT; for performing this business process it requires some data such as: (Condition, Quantity, P.No., P. Name).
- 4- Bill CUSTOMER; the business process should submit an invoice to the CUSTOMER.

5- Receive PAYMENT; to perform the process the company needs data about PAYMENT methods and who is the CUSTOMER incurrent, therefore some data are required: (Seq., Date, Amount and Type).

B. Identify Relationship; the direct relationship must be identified among business entities; therefore, it is specified as following:

CUSTOMER ---uses--- E-COMMERCE

One customer can use one E-commerce; One E-commerce is used by one or more customer.

E-COMMERCE ---selects--- INTERNET

One Internet may be selected by one E-commerce; One E-commerce uses one Internet.

E-COMMERCE ---assign--- PRODUCT

One E-commerce can assign one product; One product is assigned to one or more E-commerce.

INTERNET ---makes--- PAYMENT

One Internet makes one payment; One payment is made for one Internet.

E-COMMERCE ---notify--- CUSTOMER

One or more E-commerce can notify one Customer; One Customer is notified by one E-commerce.

C. Add Attributes

Any entity needs attributes to perform the business process therefore, attributes are very important in Data Modelling this process is done after identifying the entities and relationships among them.

CUSTOMER; Name, No., Address, Zip Code, Phone and Notification.

PRODUCT; Condition, Quantity, Product No. and Product Name.

E-Commerce; SW, Mobile Phone, Laptop, PC and Tablets.

PAYMENT; Seq., Amount, Date and Type.

INTERNET; IP and Browser.

Now the Data model diagram is more understandable but it is still not ready for deployment.

D. Assign Identifier

Identifier is one of the attributes in each Entity and it has some requirements for assigning therefore, to assign one it must contain a unique value such as: for CUSTOMER object I selected the attribute (No.) because its value cannot be duplicated.

CUSTOMER: (No.)

INTERNET: (IP)

PAYMENT: (Seq.)

PRODUCT: (P.No.)

E. Validate the Data Model

To make sure and be certain that my conceptual Data Model is complete and satisfies the Customer\Company, it's a must to review and validate the Data Model, therefore this step is very important.

The Data modelling process is completed and can be submitted to the Software Developer to program as shown in Figure 4.

IV. Conclusion

I concluded that E-Commerce is growing rapidly day after day through the use of new inventions in technology such as cell phones, tablet, smart watches, etc. which raised a various types of E-Transactions: E-Commerce, M-Commerce and my new concept (term) SW-Commerce. Therefore, using the concept will be globally raised soon and set as the standard and easy method for Transactions due to its lighted weight and availability all the time by the user (Customer).

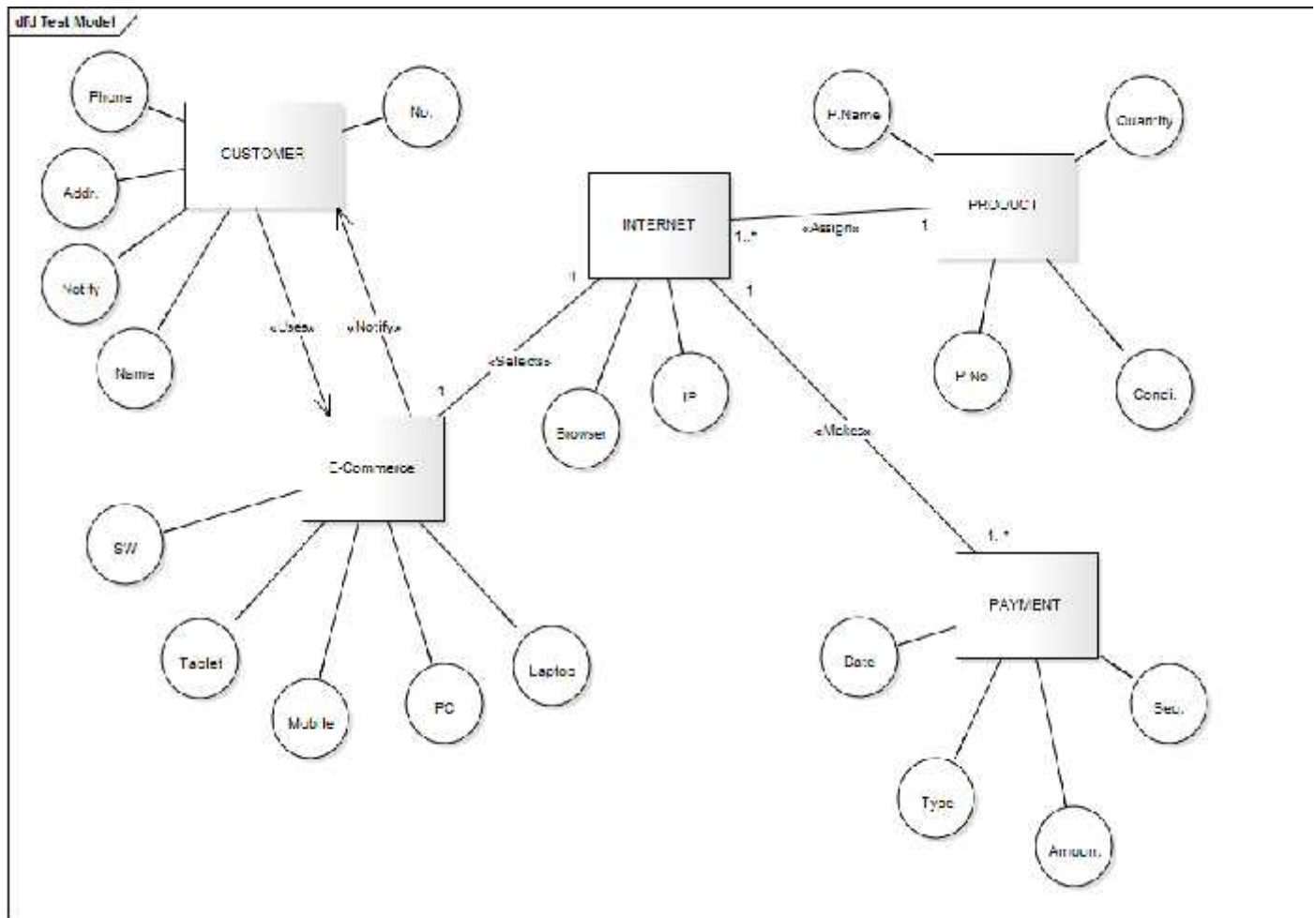


Fig. 4 Data Model Diagram

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