

An e-Commerce Framework for Wearable Devices

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Abstract. The main drawback of pervasive computing is the lack of infrastructure on which ubiquitous applications should be deployed on. [Sta02] The deployment of the resources required by pervasive computing require expensive hardware. These considerable disadvantages led to the area of wearable computing. In this poster we briefly describe our work in the area of wearable computing, where we apply some major concepts of ubiquitous commerce to achieve a generic e-commerce framework that can be used by any wearable device.

1 Introduction

Wearable computing facilitates a new form of humancomputer interaction comprising a small bodyworn computer (e.g. user programmable device) that is always on and always ready and accessible. In this regard, the new computational framework differs from that of hand held devices, laptop computers and personal digital assistants (PDAs) [WeCo]. Mobile computing means that the computing device is not continuously connected to the base or central network. Mobile devices include PDAs, laptop computers, and many of today's cell phones (aptly called smart phones) [TRTX]. Ubiquitous Commerce is a form of commerce in which devices embedded in all terminals and goods are interworked [DigT]. Hence the primary objective of this research is to amalgamate the fields of Wearable Computing, Mobile Computing and Ubiquitous Commerce together. This will formulate new theories that will be used to construct an innovative framework that will run on any type of wearable device. This framework will assist users in performing any complex e-commerce transactions from their own wearable device.

2 Framework

Figure 1 illustrates how the main components of this framework will be connected to each other. The marketplace portal will allow suppliers to set up a profile. The system will publish the selected supplier services to users of wearable devices. The suppliers will set up their profile through a web interface. The web interface will subsequently trigger an engine which will generate a dynamic set of services

for the particular supplier. Subsequently these dynamic set of services will be forwarded to the chosen location based servers. The task of these location based servers is to advertise a variety of supplier services to users of wearable devices. Users of wearable devices will need to have a client based application which will handle any communication with the location based servers. Once a transaction between a client and a supplier service has been completed the location based server will notify the marketplace portal that a particular transaction was successfully completed so that it updates the suppliers account and notifies the supplier directly through email.

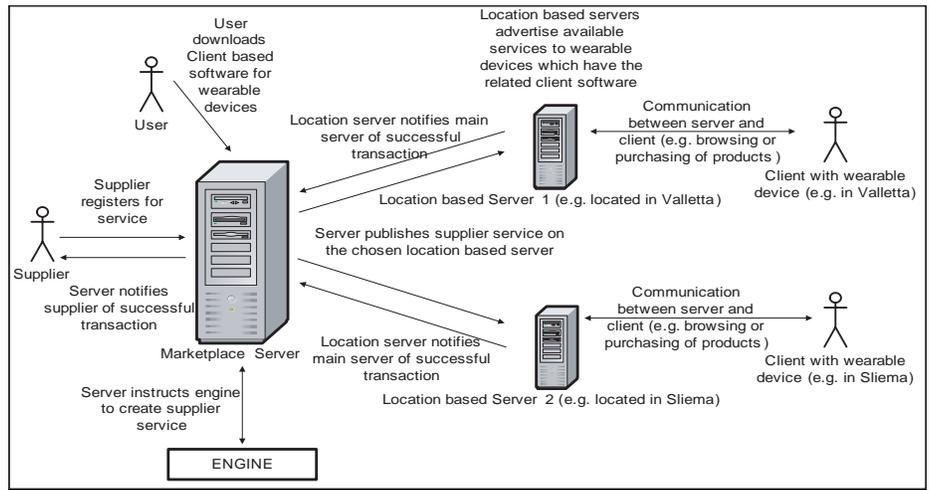


Fig. 1: Main System Architecture

2.1 Marketplace Portal

The Marketplace portal will be the main component of the system. All the other components have to either communicate with this component or are triggered from this component. The marketplace portal will mainly consist of a web interface which suppliers will use to sign up to the wearable commerce marketplace, define the services which they require and define which location based server will propagate their service. Suppliers will also use this portal for statistics gathering and adjustments to their profile. The customers will use this portal to download the wearable software application that will be used to interact with the location based servers and to identify what transactions they conducted through this wearable e-commerce marketplace.

The marketplace portal will also initiate the engine that will create the supplier services. The communication with the location based servers will also be handled by this portal. Finally this marketplace will also have an admin interface for the

administrators of this system. This will give admin users the possibility of tuning the functionalities of the portal and location based servers.

2.2 Dynamic Service Creation Engine

The service creation engine will be launched exactly after that a supplier activates his subscription to the wearable e-commerce system. It will use the information entered by the supplier to create the required services. This engine will also be initiated when the supplier or administrator of the system perform some changes to the existing services.

Once that the engine dynamically creates the required services, it will determine which location based servers will publish the service and consequently it will transmit the service to the selected location based servers. At this stage the location based servers will plug in the newly received service until they receive further modification requests from the engine.

This engine will have to be as extendable as possible because it will need to cater for new behaviors that might be inserted into the marketplace portal. This means that if the marketplace administrators decide to upgrade the system with new features then only the engine and the relevant user interfaces will have to be upgraded. From the location based server's side there will be no updates. The client application software will have to be upgraded to deal with the new behaviors of the wearable commerce server.

2.3 Wearable Client Application

The primary objective of this application is to communicate with the location based servers. This is the only technique which can be used to transmit data to the location based servers and therefore have access to supplier services. The wearable client application will fulfill all services that will be accessible from the marketplace portal. The services will only be available when the wearable application will be in the area that is covered by a particular location based server. Only the services that are registered to the particular location based server will be published to the wearable client applications in that region. The wearable client application will send various type of messages to the location based servers because it will need to present the user with the essential information.

The location based servers will periodically advertise their existence through message sending. Once that a client application enters an area covered by a location based server the communication between the location based server and the wearable client application will be initiated. The location based server will send the services according to the clients location except for when a client requests for specific details. (e.g. if a client is in front of a music store the location based service will send the details of that music store).

When a client enters a particular store the location based server will send the details of that particular store together with competitors information. Once in a store the user might request the location based server for characteristics of a specific product without querying the shop attendant. The location based server

will also supply the pricing of the competition. The client may decide to buy a specific item from a store without notifying the shop attendant. Once that a client wearable application exits the area covered by the location based server the connection will be terminated.

2.4 Location Based Servers

The location based server will be placed in a strategic business location. The primary idea is to cover a business district such that users will conduct business through the use of their wearable device which will be in constant contact with the location based server that is taking care of that specific business area.

Each location based server will have to be installed on a machine which will be located in a distinct business district. The location based server will need to have the location details of each shop that is located in that business district. The compulsory details that the location based server will need to know about each store in a particular business district include the name and the global positioning of that store.

All this information will be entered during the installation of the location based server. Afterwards the location based server will need to register its existence to the marketplace portal. This step is crucial because at this stage the marketplace portal will send the details of the services and suppliers that will be advertised by the just registered location based server.

3 Conclusions

This work takes e-commerce technology to a new level, through the deployment of major principles of pervasive computing on a wearable computing architecture. It is expected that a situation similar to that already experienced with mobile phones will occur for wearable computing. This means that wearable devices will become an integral part of every day life such as going to eat, shopping and all sorts of daily situations. Areas such as sports will require wearable devices because such devices will be capable of offering a massive amount of information concerning the event that is being followed [Tsu04]. This functionality will also be extended to museums, amusement parks, stores, shops, bars, restaurants and public services.

References

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