

# Crop Production Context Aware Enterprise Application

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**Abstract.** This new computing context demands entirely new software architectural paradigms that address the challenges of mobile software development, are specialized for the nature of mobile devices and wireless networks, and take advantage of the opportunities afforded by mobile systems. Recent research has rapidly advanced the state-of-the-art in architectures for mobile software and systems. Researchers have established the technical basis for mobility by creating formal models of and engineering processes for mobile software. This paper proposes Frameworks for Crop Production Context Aware Enterprise Application using CBD (Component-Based Development) and mobile Services for information interchange in the RFID-based distributed computing environment. We are trying to analyze requirements of crop production aware enterprise application framework, CBD, mobile and Web Services which is RFID-based network environment. Also we will show how to construct the enterprise applications using the proposed Crop Production Context Aware Framework by changing the contents of the Application.

**Keyword:** Crop Production Context Aware , Enterprise Applications ,RFID, EPCglobal, CBD, Web Services, Middleware

## 1 Introduction

Context is any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves.” [1]. It aims to be useful for classifying applications to be context-aware. Other authors use the traditional understanding of context as certain circumstances and surrounding information and divide them into classes. Researches and developments for ubiquitous computing environment which is human centered future computing environments are widely preceded. One of them is the research and development of RFID (Radio Frequency Identification) technology [3, 4]. Mobile and Web Services is an interface which describes a set of accessible network commands through standard XML messages. Also, Web Services can incorporate distributed components which are implemented by the existing different protocol, and can

provide distributed computing over the Internet. In this paper, to propose Crop Production Context Aware Enterprise Application Framework which is based on RFID and distributed computing, we will study RFID technology, integrate the distributed component environment, and use CBD (Component-Based Development) and Web Services where the distributed computing is available over the mobile and Internet.

## 2 Related Work

### 2.1 Context Aware Systems

The Context, context-awareness and features of context-aware applications are defined. But where do these contextual data come from? In Fig. 1 we introduced provisioning but no sources or possibilities to gather them. Roles Context-aware systems are mostly organized by more than one entity. Single devices have a limited input of data (built-in sensors). In addition, data have to be sensed, refined, compared, evaluated, processed, modeled, stored and disseminated frequently. Simple portable devices maybe have the computing power to do that, but not the capacity (e.g. battery) to do that all day long. A division of work allows the realization of context-aware systems. The roles will be allocated to the involved gadgets and describe the process of trade or exchange[1].

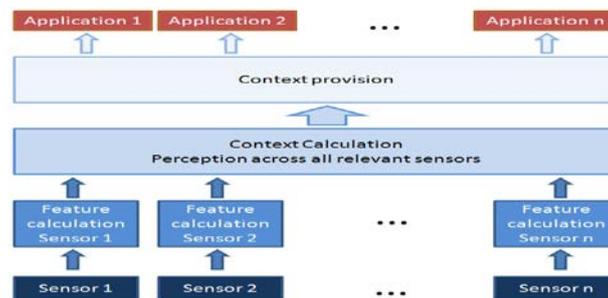


Fig.1. Context Aware Applications General Architecture

### 2.2 CBD (Component-Based Development)

Software components are binary units of independent production, acquisition, and deployment that interact to form a functioning system. Composite systems composed of software components are called component software [2,3]. Abstractions, such as procedures, classes, modules, or even entire applications could form components, as long as they are in a 'binary' form that remains composable. The benefit of

component software is as follows: components are the way to go because all other engineering disciplines introduced components as they became mature [4].

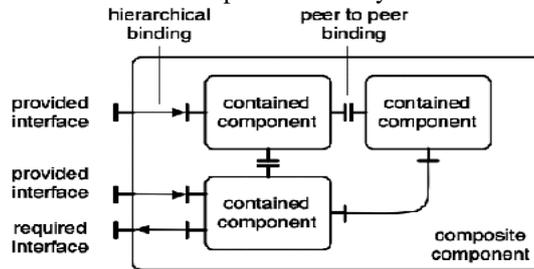


Fig. 2. Composite component on CBD

### 3 Design of Crop Production Context Aware Framework

#### 3.1 Architecture of Crop Production Context Aware Framework

Architecture of RFID-based crop production context aware Enterprise Application Framework using CBD (Component-Based Development) and Web Services is shown in Figure 3. Application Layer consists of domain dependent components in which domain specific modules such as ERP(Enterprise Resource Planning), SCM(Supply Chain Management), or Warehouse System may be situated.

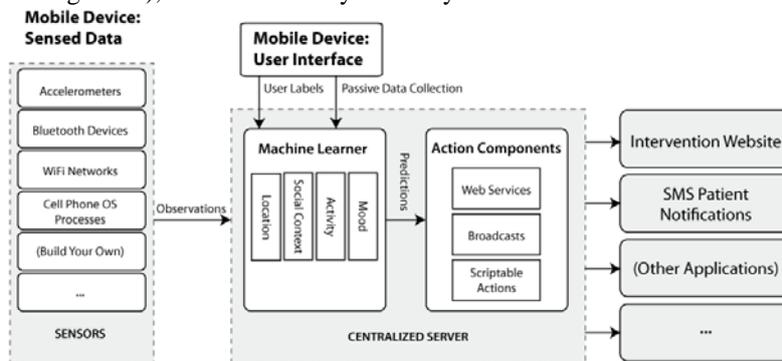


Fig. 3. Architecture of Crop Production Context Aware Framework

Mobile device sensed data Layer consists of domain independent components in which domain neutral SENSORS devices such as accelerometers, Bluetooth, Wifi networks, Messaging Modules, Transaction Manager, and so on, may be situated. These modules need not to be modified even if the domain is changed. This is one advantage of CBD (Component-Based Development). Our proposed crop production encryption module support both symmetric cipher and asymmetric cipher, and also provides the function of XML as in figure 4.

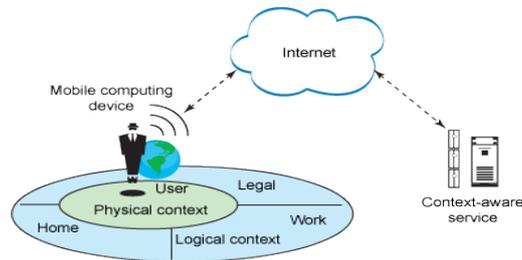


Fig.4. Crop Production typical Application flow

## 5 Conclusion

Context is any information that can be used to characterise the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves.

In this paper, we have proposed Frameworks Modeling for Crop Production Enterprise Application Framework which is based on RFID technologies, and have utilized CBD (Component-Based Development) and Web Services to address the problem of the distributed computing over the Internet. In the future, we will design and implement the detailed system for the proposed model in this paper. Also we will investigate the business application framework in more detail to leverage linkage between enterprise application and middleware or EPC related information.

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