

Web Based Software Architecture Model for Shankarpura Mallige Growers

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Abstract

Udupi is a City in the south-west Indian State of Karnataka. Udupi is famous for Shankarpura Mallige (Jasmine). This unique type of Jasmine is named after a small village in Udupi where it is grown. Shankarpura Mallige has been given the Geographical Indication tag. The farmers of this region face the problems like (i) High price fluctuation (+/- 40%) (ii) Plant Disease (iii) Untimely rain. This paper proposes a Web Based Software Architecture Model that represents a Software System to reduce the impact of the problems faced by the Shankarpura Mallige growers.

Area of Research: *E- commerce / Web and Internet Computing*

1. Introduction

Udupi is a City in the south-west Indian State of Karnataka. It is the headquarters of Udupi District (13.3389° N, 74.7451° E); Udupi is famous for Krishna Temple, Malpe Beach and Shankarpura Mallige (Jasmine). This unique type of Jasmine is named after a small village in Udupi where it is grown. Shankarpura Mallige has been given the Geographical Indication tag. A GI tag is useful in indicating that the produce has originated from a particular region. The commercial cultivation of Shankarpura Mallige started 100 years ago. About 300 families in Shankarpura and surrounding region grow this flower. The average holding of each of these growers is 0.5 to 1 acre (2,000 to 4,000 m²). Shankarpura Mallige grows in small and bushy plants with leaves of light green with a yellowish shade. The laterite soil, high humidity, and heavy rainfall (more than 2,500–3,000 mm or 98–118 in per annum) make this region ideal for this crop.

- i. **Price Fluctuation:** One of the major problems faced by the Jasmine growers of the region is rate fluctuation. (+/-40%). The price is totally dependent on demand and supply often determined by the middlemen/agents who collect the flowers and sell it to the local retailers. Even though the efforts such as building of an auction center and conceiving the idea of cold storage have been made they are not entirely successful. The newly built auction center at Doddanagudde (15 Kms away from Shankarpura) in Udupi will not solve their problems due to the location disadvantage of the auction yard. It would not be easy to the growers most of small growers to send their produce from Shankarpura to Doddanagudde. Shelf life of the flower is just 12 hours which includes the 7 hours for plucking, tying and marketing them. The proposal for cold storage also may not help as Shankarpura jasmine becomes red within two hours of its removal from cold storage.

- ii. **Plant Disease:** The Shankarpura Mallige plants also often get infected by leaf-spot disease which reduces the yielding capacity by around 80%.
- iii. **Untimely Rain:** Sudden untimely rains also make the flowers to fall before plucking it.

2. Objectives of this Paper

- To propose a Web Based Software Architecture Model (WBSAM) to reduce the impact of the problems faced by the Shankarpura Mallige growers.

3. WBSM Use-Case Diagram

Figure 1 and Table 1 give the details about the functionality expected from the system.

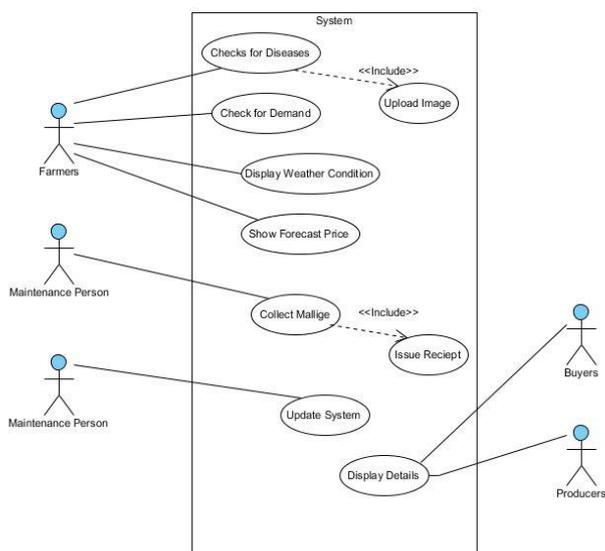


Figure 1: Use Case diagram showing WBSM functionality

Uses Case	Description	Actors
Check for diseases	<ul style="list-style-type: none"> • Check for diseases involve asking the farmers to upload the images of their plants. • Using Image processing techniques like “Ridge Based Segmentation” and “Color Detection”, system may be designed to give an update regarding possibility of plant being infected. 	Farmers
Check for Demand	<ul style="list-style-type: none"> • Predict the demand by applying the data mining techniques using the past and current data. 	Farmers
Display Weather Condition	<ul style="list-style-type: none"> • Provide/Predict the information about the weather condition. The system can be integrated with applications provided by “AccuWeather” and “The Weather Channel” etc. • This will help the farmer to be prepared for bad weather conditions. 	Farmers
Show Forecast Price	<ul style="list-style-type: none"> • Forecast prize by comparing prices of previous days with the help of some general data mining techniques and forecasting algorithms 	Farmers
Collect Mallige	<ul style="list-style-type: none"> • Agents allotted to the specific areas collect the produce from the growers and generate receipt to the farmers 	Agents
Update Details	<ul style="list-style-type: none"> • The person responsible for maintenance will obtain the information from the agents such as selling price, etc and update the system with recent information. 	Maintenance Person
Display Details	<ul style="list-style-type: none"> • It will provide the information about the Shankarpura Mallige; number of farmers registered to the system. 	Buyers, Producers

Table 1: Use Case Description of WBSM functionality

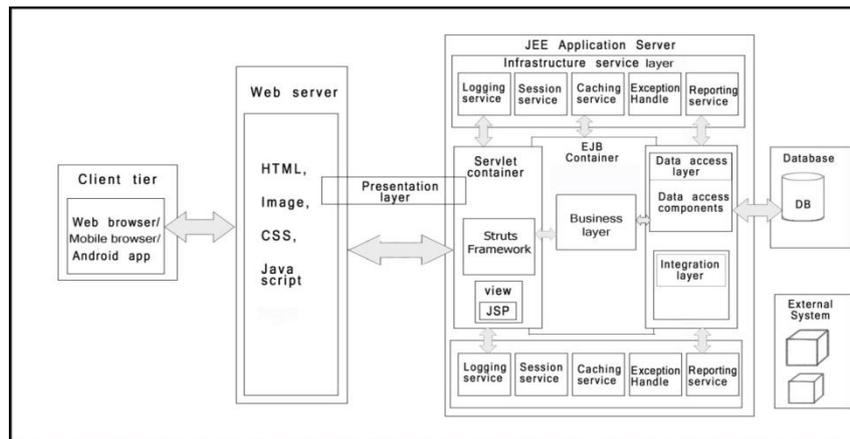


Figure 2: Web Based Software Architecture Model-Derived and Modified from the Enterprise Architecture Model proposed by (Anubhav Pradhan 2010)

The proposed web based system has five layers

- i. Presentation layer: Presentation layer being the face of the system provides the content and the data in a user friendly manner and responds to the end user generated events. The user will access the system from the client tier through web browser or mobile browser or android application. Depending upon the action taken by the user in client tier appropriate request and information is sent to the servlet from the web server. The request is mapped to the struts action class. The result of the struts action class is sent to the business layer.
- ii. Business Layer: Some of the main business logic such as data mining techniques and image processing techniques should be implemented in the business layer.
- iii. Infrastructure Service layer: Some basic services like authentication, authorization, logging, exception handling and session management are fulfilled by the infrastructure service layer. Trace information generated during the execution of the business logic is logged into the log files and helps to handle the exceptions. Session management support is required for multiple concurrent users. It helps in keeping track of the user activities to ensure the integrity of various shared resources. Caching helps in improving the performance of the web based system by bringing the frequently used data to the high speed primary memory from the secondary store.
- iv. Data access layer: Data needed by the business logic form the database is fetched by the business layer from database through data access layer. After completion of business logic, the struts action class will run the appropriate JSP. JSP sends the response to the client.
- v. Integration layer: Integration layer provides the facility to connect to the external system such as banks.

4. WBSM Activity Diagram

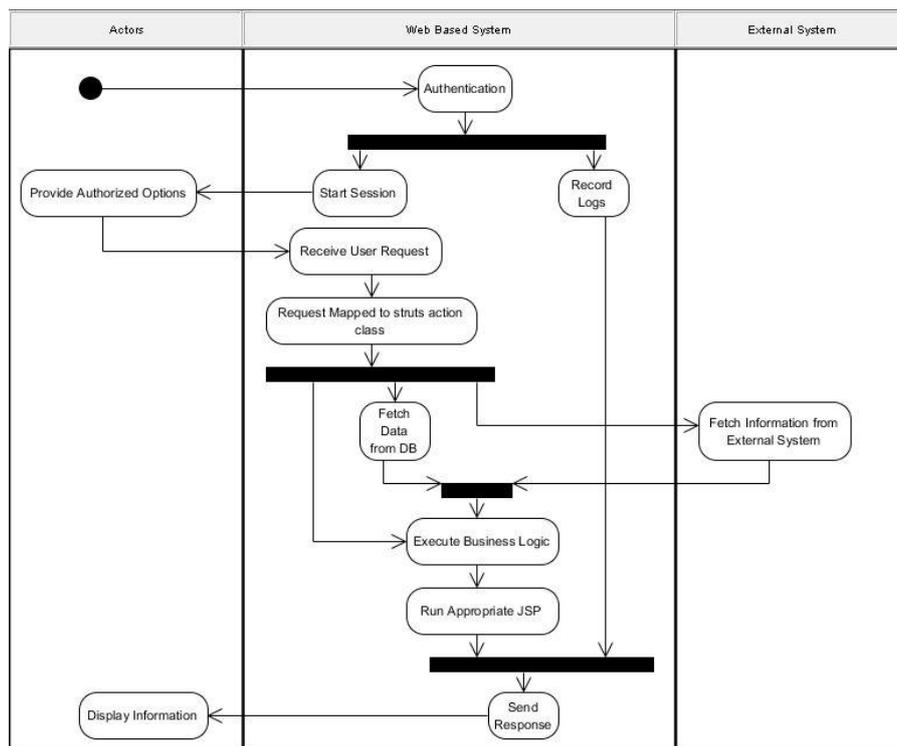


Figure 3: Activity diagram showing WBSM functionality

The actors have to authenticate themselves before using the web based System. Session starts once the actor is logged into the system. Session management helps in keeping track of the logged in actor activities. The authorized options are displayed to the actor. Actor will choose among the options provided. Once the request is received, it is mapped to the struts action class. Depending upon the action mapped in the struts action class, the required data is fetched from the database and external system for the execution of the business logic.

Business logic mainly includes general data mining techniques and image processing techniques. By using past and current data, the general data mining techniques help in predicting the demand. The images processing techniques such as “Ridge Based Segmentation” and “Color Detection” may be designed to give an update regarding possibility of plants being infected. Result after the execution of business logic will run the appropriate JSP. All these activities will be logged into the log files. These log files play a vital role by providing the information during exception handling. The JSP sends the response, and the information is displayed back to the actor.

5. Conclusion

The web based model is been designed to tackle the challenges posed by the intermediaries, who block important demand/supply information from passing to the growers and use that information for getting a larger margin for themselves. WBSM will provide transparent transaction to enable the involvement of small as well as large growers. Elimination of some tiers of intermediaries will allow the larger share of profit to reach the growers.

References

- [1] Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu, 2010, *Raising Enterprise Applications: A Software Engineering Perspective Wiley India Pvt. Ltd*, ISBN 13 : 9788126519460,p-45
- [2] P Thippaiah, 2005, *Floriculture in Karnataka: Performance, Problems and Prospects* prepared for Government of Karnataka Agricultural Development and Rural Transformation Unit Institute for Social and Economic Change Nagarbhavi, Bangalore-560 072 Available at <www.isec.ac.in/FLORICULTURE.pdf>
- [3] *Economic Survey Report 2012-2013*, prepared for Government of Karnataka, Planning Programme Monitoring and Statistics Department, Available <<http://planning.kar.nic.in/node/128.html>>[5 February 2014]
- [4] *'Shankarpura mallige' price hits record level* Available from <<http://www.thehindu.com/todays-paper/tp-national/tp-karnataka/shankarpura-mallige-price-hits-record-level/article4033321.ece>>[26 October 2012]