

System Design Document

Change History			
Version	Author	Description of changes	Date
1.0	KA, SB, MK	Initial release.	05.12.2017
1.1	KA	- Added "SRS" to acronyms - Corrected small typos in chapter "Purpose of the system"	09.12.2017
1.2	KA, SB	- Added chapters "Persistent Data Management" and "Access Control and Security" into the document - Updated picture in section "Boundary Control" to reflect current state	13.12.2017
1.3	SB	- Updated "Subsystem Decomposition" to reflect the compliance with the new or changed requirements R3,R28 of the SRS	20.12.2017

Legend:

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1. INTRODUCTION

1.1 Purpose of the System

The creation of an online shop, to digitize the sales process. It enables the possibility that people can buy books online.

1.2 Design Goals

This document fully specifies all traits relevant for the implementation of the book store's online platform.

This online platform is intended for sale of arbitrary books over the internet via a website and shall include functions for

- administration
- sales and shipping management
- data storage

The system does not

- provide customer relation tools
- track business data for reporting

This document serves as a development resource and as a legally binding document for the implementer (MKS-Software Solutions) and the customer (best book shop).

1.3 Definitions, Acronyms, and Abbreviations

ISBN: International Standard Book Number

BBS: best book shop (the system that has to be implemented)

SRS: System Requirements Document

1.4 References

- SRS
- Tutorial exercises

1.5 Overview

This software design document is structured according to the template discussed in the lecture. This document is subdivided in three parts. The first part gives an overview of this document. The second part will give a description of the current architecture. In the third part will be a description of the architecture proposed by MKS-Software Solutions.

2. CURRENT ARCHITECTURE

A website already exists but it does not support the function of browsing the books nor is it possible to buy them online.

3. PROPOSED ARCHITECTURE

3.1 Overview

The book-shop's system shall be a fully self-contained system that contains all functionalities of an online web shop. The system shall be subdivided into various subsystems. The shop will use a shopping cart tracking system and other proprietary subsystems. An overview how these subsystems are connected to proprietary interfaces can be found in figure 1. How

these subsystems shall communicate with said interfaces is defined later. The subsystems are the following:

- Web frontend
- Order backend
- Database
- Shopping Cart application

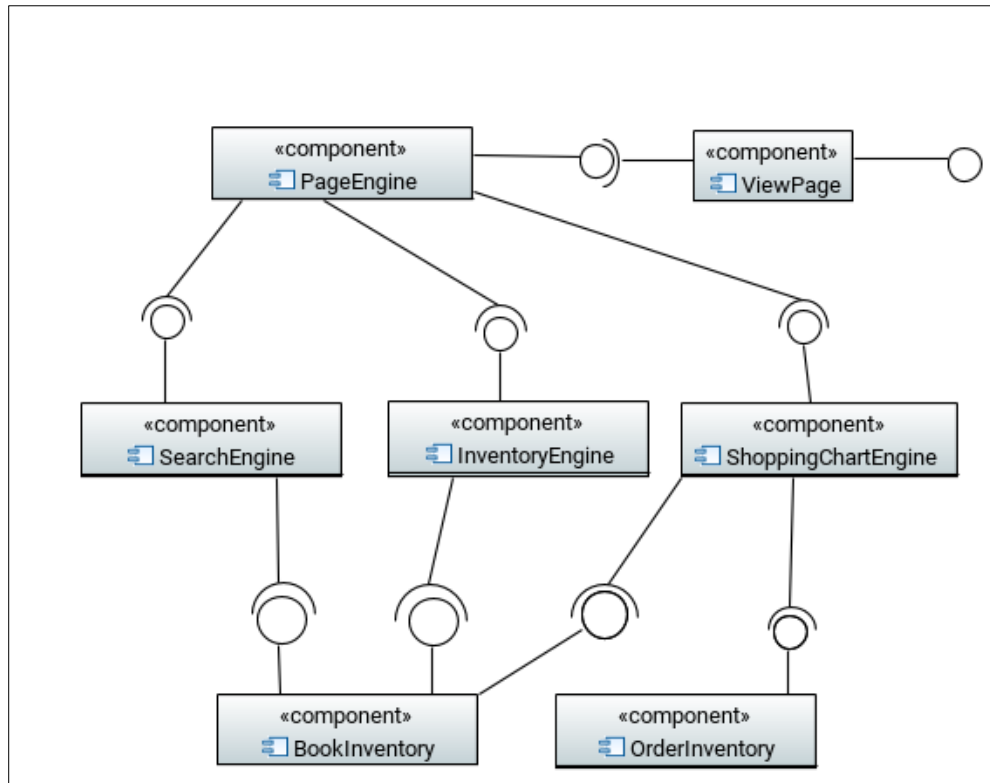


Figure 1

3.2 Subsystem Decomposition

In figure 1, the subsystems (components) and their various interactions are depicted. The connections between the subsystems and the proprietary interfaces of them are described in this chapter, as well as the individual tasks each sub-subsystem (parts of the components) has to handle.

These sub-subsystems are, for each subsystem:

1. ViewPage

- User interface
- Data presentation

2. PageEngine

- Order processor
- Authentication
- Database interface

3. SearchEngine

- Database Interface
- Page Interface

4. InventoryEngine

- Database Interface
- Database updater
- Page Interface

5. ShoppingCartEnigne

- Database Interface
- Database updater
- Page Interface

6. BookInventory

- Organization Handler

7. OrderInventory

- Order Processor
- Organization Handler

3.3 Hardware / Software Mapping

In this section, it is described how the subsystems are assigned to the related hardware.

Figure 2 gives an overview of this mapping with the help of a deployment diagram.

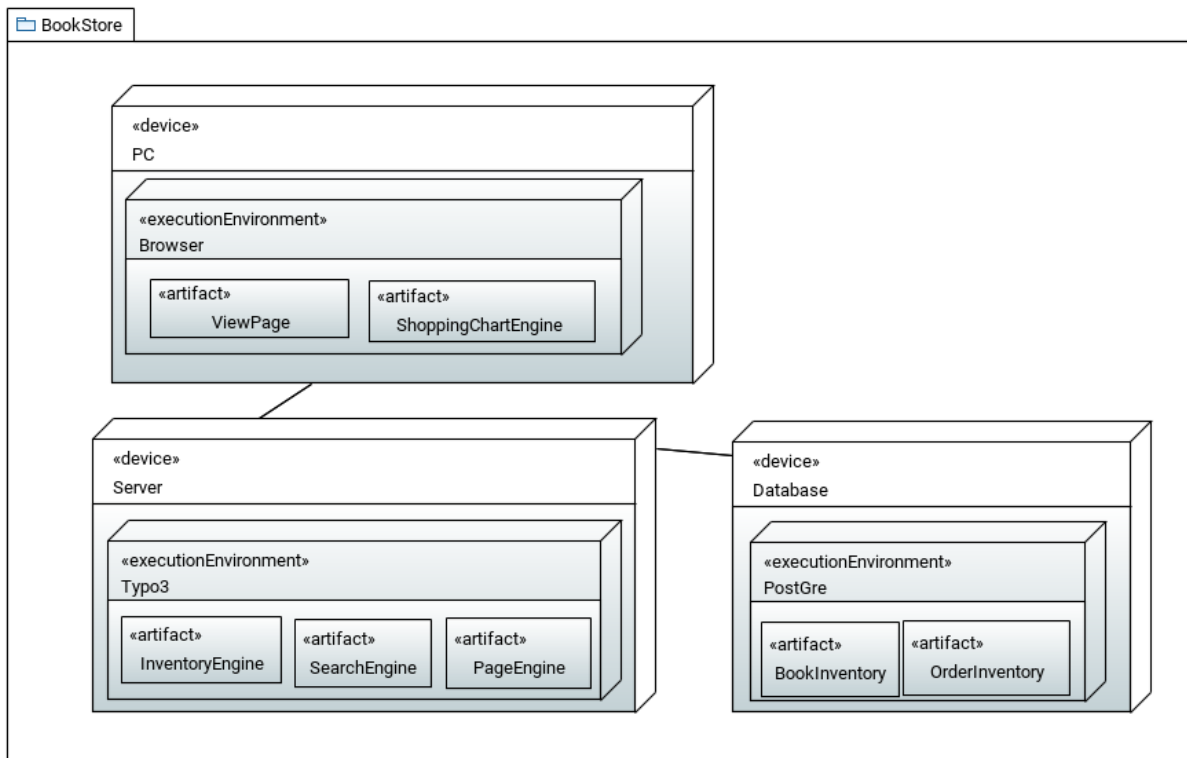


Figure 2

3.3.1 Mapping to the PC

The environment on the PC is a simple web browser, where the ViewPage and the ShoppingCartEngine are allocated to it.

3.3.2 Mapping to the Server

A Typo3 Content Management System runs on the server, where the Inventory Engine, the SearchEngine and the PageEngine operate on it.

3.3.3 Mapping to the Database

A PostgreSQL execution environment runs on the Database device, where the subsystems BookInventory and OrderInventory operate on.

3.4 Persistent Data Management

The Data that will be stored in the database will be items which represent books and orders. Data for this system is stored in one database and is accessed in several forms. The stored information is accessed by the components of the upper Business Logic Layer.

The information regarding the books will be stored in a simple table. Each book has got a unique identifier that is called ISBN, a title and an author. Furthermore, the table also stores information to the book's year and a brief summary.

The information regarding the orders is also stored within a table. The table also has got a unique identifier that is called order number. Furthermore, it stores information like the price, the date, the purchaser's name and address and its status. The status will be updated by the InventoryEngine.

3.5 Access Control and Security

Only the owner of the book store has got privileged access to the system. As the administrator, he can enter the system using a password. The customers do not have any access rights, as long as the system provides a login-free purchasing mechanism.

3.6 Global Software Control

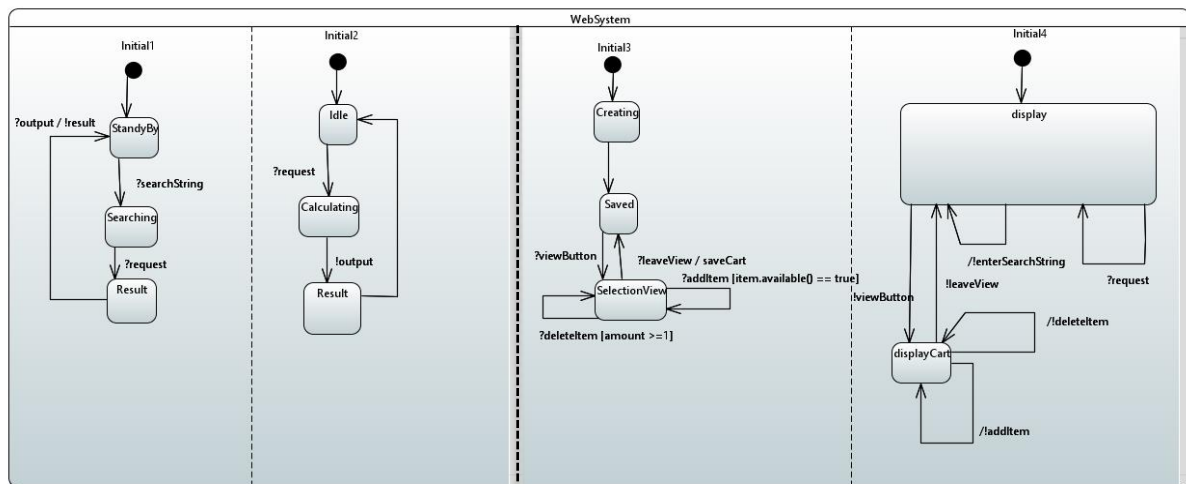


Figure 3

The statechart diagram describes the global control behavior and concurrency events. As the the view page is displayed, it is possible to enter a search String in the search bar. In the case of typing something into the search bar and clicking on the search button, the search engine will go into a searching state and present the results after the inventory engine gets the requests. It calculates the result and forwards it. It is possible to add items into a shopping cart. The shopping cart will save its status when it has been created or when the shopping cart's view is left, after adding/deleting items in the cart.

3.7 Boundary Conditions

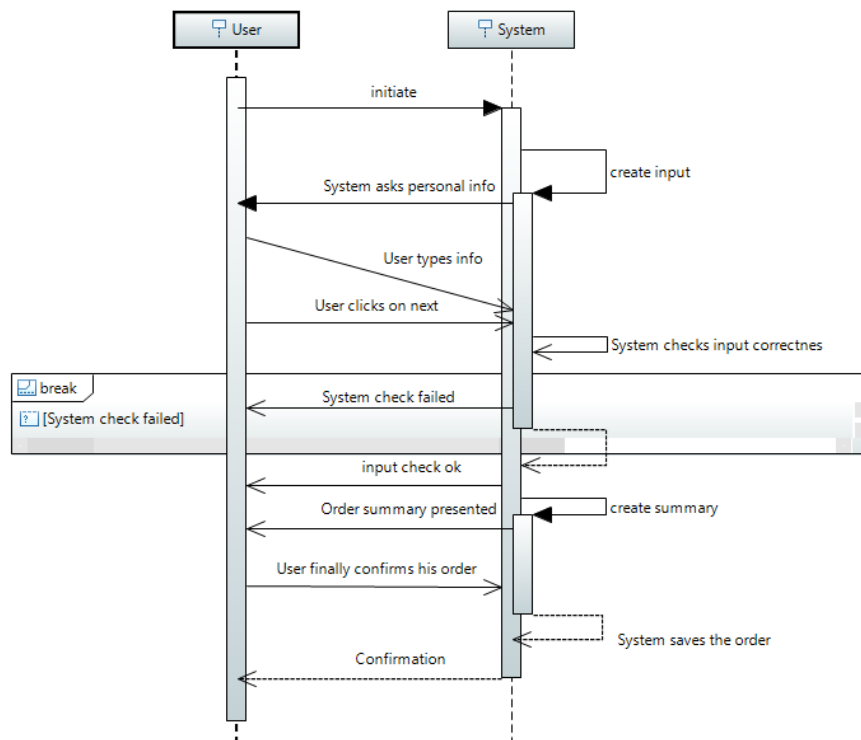


Figure 4

The sequence diagram describes the purchase process with the newly created software, including a failure behavior. In this process, the user firstly has to enter his personal information, e.g. his name and the location to which the books are meant to be delivered. The user enters his personal information and the system replies with a confirming dialogue. The system then checks the input for any syntactical errors. If an error occurs, then it will be displayed to the user. If no errors occur, the system asks for confirmation before the process continues. The user continues in the process by pressing the next-button. Afterwards, the system presents the user a summary of his order and his input, linked up with a buy-button. The user clicks on the buy-button and confirms his order. The system confirms the order and the user gets feedback from the system.