Software Requirements Specifications for Project “BookExpress”

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Chapter 1

Product Purpose

To handle the addition of new books and the distribution in a better way, "BookExpress" asked us to develop an IT solution to optimize the idle time and labour usage by getting rid of the current, deprecated system. Furthermore one important goal of the software solution is to be very user friendly and easy to use; also there should be remote access implemented, so several customers can access the software at once and distribution partners can access and keep their book stock up to date.

1.1 Obligatory Requirements (“must have”)

1.1.1 Communication with Publishers

The direct connection between the **publishers** and BookExpress shall be implemented by providing a web interface for the publishers.

- As each publisher also has a PIN, it will be used as the account name for the interface.
- The web interface has to provide the following features for the publisher: maintain the book database (add books, remove books, edit book data), edit their personal data, view statistics on how often which books are bought
- The interface has to be comfortably accessible from mobile devices as well, the data that is transmitted should be minimal

1.1.2 Communication with Customers

The direct connection between the **customers** and BookExpress shall also be implemented by providing a web interface for the customers.

- As each customer already has a unique identifier, the PIN, we will use it as an account name for the login.
- The web interface has to provide the following features: view catalogue and stock, submit orders, view the current state of their orders and cancel them (if they haven't been shipped yet)
- The system has to assign a unique ID to each order, ideally incorporating the PIN of the customer
- The interface has to be comfortably accessible from mobile devices as well, the data that is transmitted should be minimal

1.1.3 Internal Administration

The employees of BookExpress shall be provided a web interface as well.

- Each employee will get a unique user ID to log into the web interface. Ideally, this will be formatted along the lines of surname.name or something similar.
- The web interface must provide the following features for the employees: processing, editing and cancellation of submitted orders, directly contact the customers and publishers as well as the truck fleet and the warehouse
- Furthermore, the underlying system shall generate logfiles with login times, error codes and statistics (e.g. which books are ordered the most and by whom) for the publishers and the accounting and IT department / tech support.
- The interface has to be comfortably accessible from mobile devices as well, the data that is transmitted should be minimal

1.1.4 Support

- The system should be as automatic as possible - we need a good, user-oriented manual.
- Additionally, a context-sensitive help tool has to be implemented in the interface itself.
- Moreover, As we want to make sure that the system is as reliable as possible, we will need a dedicated support team that is available 24/7 and can be dispatched in less than 2 hours to fix critical issues.

1.2 Optional Requirements (“nice to have”)

- Book Stores should be able to save recurring orders
- Book Stores should be notified when the delivery of their order is imminent

1.3 Non-Requirements (“need not have”)

- The software should not allow final customers to buy books. It is only intended for retailers.
- Moreover, invoices are generated elsewhere, as well as financial reports, so the system should not interfere with that.

Chapter 2

Product Environment

The Product takes the orders from the book stores and files them into the system, so that they can be prepared for shipping. For different sized book stores there should be several account types with separate functionality and different options for packaging and ordering. The targeting groups of the software solution are the book store owners(our consumers), the assistants of "BookExpress" and the distribution partners.

2.1 Application Area

The new IT system should replace the old system and provide administrative and commercial functions to relieve the employees of unnecessarily complex administrative tasks. Certain processes can be handled without any interaction at all, e.g. if a book runs low in stock, the system will automatically order new copies from the publisher.

2.2 User Groups

- BookExpress commercial employees
- BookExpress IT employees
- Publishers
- Book Stores

2.3 Operating Conditions

Chapter 3

Product Overview

The products environmental diagram.

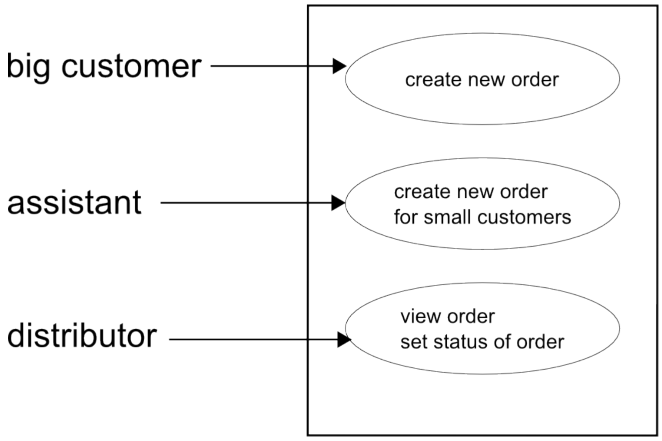

Figure 3.1: The environmental view of the product

Chapter 4

Product Functions

4.1 Internal

4.1.1 Employees of “BookExpress”

/PF10/	**Process**	Register Publisher or Book Shop (client)
	Actor(s)	BookExpress employee
	Category	
	Description	A Book Express employee creates an account for a book shop or publisher after both business partners have signed a contract handling the business relations.
	Goal	The contract partner should have an account to log into the Software. After registration through the Book Express employee, the contract partner will be send a verification and its account information via email.
	Preconditions	Contract signed
	Postcondition success	Successfully created account
	Postcondition failure	Unsuccessful in creating an account
	Trigger	Menu option "register new client" (Software)
	Sequence	Input relevant data and contractor details into the managements system Save the signed contract on the server Register a new client by creating a new ClientID in the database Send verification and account information to the contractor

/PF20/	**Process**	Edit client information
	Actor(s)	BookExpress employee
	Category	
	Description	The clients data is outdated and needs to be updated
	Goal	Client data is updated
	Preconditions	Client exists in database
	Postcondition success	Client data is updated and a notification mail is sent to the client.
	Postcondition failure	Client data is not updated but rolled back to the previous state. Notification with problem report is shown to the employee.
	Trigger	Menu option "edit client data" (Software)
	Sequence	Menu option "edit client data" Edit specific data Submit edited data to the server

/PF02/	**Process**	Delete account
	Actor(s)	BookExpress Employee
	Category	
	Description	Client gets deleted due to resignation of the contract
	Goal	Delete client from the system
	Preconditions	Client exists in database Contract is being resigned by one of the contractors
	Postcondition success	Client is deleted from the system
	Postcondition failure	Client could not be deleted because of existing orders
	Trigger	Menu option "delete client" (Software)
	Sequence	Choose client Check if client is deletable (i.e. no existing orders) Send notification mail to client Delete client

/PF/	**Process**	Client places order
	Category	
	Actor(s)	BookExpress employee, client
	Description	A client orders book via telephone
	Goal	Order is placed in an order queue
	Preconditions	Client exists in database Client is authorized
	Postcondition success	Order is placed in an order queue
	Postcondition failure	-
	Trigger	Client initiates order process by calling an BookExpress employee BookExpress employee triggers manual order process
	Sequence	BookExpress employee selects client in Software BookExpress employee enters ordered book into the system Order is placed in order queue Order notification containing detailed report is sent to client

/PF/	**Process**	Validate order
	Category	
	Actor(s)	System
	Description	Order is checked for validation
	Goal	The software checks every order for validation and confirms it to the client. BookExpress knows about every orders validation status.
	Preconditions	Order is in order queue
	Postcondition success	Client receives a confirmation email
	Postcondition failure	Client receives a problem report about invalid order
	Trigger	Order was placed and exists in order queue
	Sequence	System gathers details and checks whether order is valid or not System sends mail to client

/PF/	**Process**	Stock Update
	Category	
	Actor(s)	System/BookExpress employee
	Description	The employee in charge of the stock checks the availability of all books and updates the stock accordingly.
	Goal	Check succeeds
	Preconditions	Order is placed or BookExpress employee initiates check
	Postcondition success	Books which are nearly out of stock get displayed as a list
	Postcondition failure	-
	Trigger	Stock check is initiated
	Sequence	Check if a book is available in an sufficient amount Make a list of all books which need to be ordered Submit list to system

/PF/	**Process**	Forward order to Logistics
	Category	
	Actor(s)	System
	Description	A validated order gets forwarded to Logistics
	Goal	Logistics proceeds processing the order
	Preconditions	Order is valid
	Postcondition success	Logistics processes delivery
	Postcondition failure	Order could not be forwarded to Logistics
	Trigger	Order is validated
	Sequence	Send order information/details to Logistics

/PF/	**Process**	Deliver order
	Actor(s)	System
	Category	
	Description	The order is send to the book store
	Goal	Deliver ordered books
	Preconditions	Order is valid Books are available in stock
	Postcondition success	Order is marked as sent
	Postcondition failure	Order could not be marked as sent
	Trigger	Forward order to Logistics
	Sequence	Check if books are in stock Receive book store information Sent order to book store Mark order as sent

/PF/	**Process**	Confirm delivery
	Actor(s)	Employee (Logistics)
	Category	
	Description	Logistics confirms the correct delivery of an order
	Goal	Delivery is successful
	Preconditions	Order is marked as sent
	Postcondition success	Order is marked as delivered
	Postcondition failure	Order could not be marked as delivered
	Trigger	Deliver order
	Sequence	Get delivery status Mark order as delivered if delivery status is "successfully delivered"

/PF/	**Process**	BookExpress Order
	Actor(s)	BookExpress employee
	Category	
	Description	The Employee orders a number of books from the publisher
	Goal	Order books from a publisher
	Preconditions	need for new books
	Postcondition success	Books are ordered and publisher gets an notification mail
	Postcondition failure	-
	Trigger	BookExpress employee initates an order
	Sequence	Select books from list or search TODO /PF/ Submit list to publisher

/PF/	**Process**	Create an invoice
	Actor(s)	System
	Category	
	Description	The system creates an invoice after TODO /PF/ order is valid
	Goal	Documenting order and deliver it with invoice
	Preconditions	Order is valid
	Postcondition success	Invoice successfully created
	Postcondition failure	Invoice could not be created
		Check information about order
	Trigger	Order is valid TODO /PF/
	Sequence	Create an entry in database List the ordered books with price List tax to invoice

/PF/	**Process**	Send invoice
	Actor(s)	System
	Category	
	Description	The invoice is send to the book store via mail
	Goal	Inform the book shop
	Preconditions	Successful created invoice
	Postcondition success	Book store receives a notification mail
	Postcondition failure	-
	Trigger	Creation of an invoice
	Sequence	Get invoice Send invoice to book store

/PF/	**Process**	Backup
	Actor(s)	System
	Category	
	Description	A backup of the complete databases must be done. This should happen periodically and save all data on a server.
	Goal	In case of a crash, every data must be saves as a preventative backup
	Preconditions	Server for the backup
	Postcondition success	Successful backup in periodical intervals
	Postcondition failure	A notification will be send to the administrator of the system
	Trigger	Configured time to start a backup
	Sequence	Start Backup Place backup on the backup server

4.2 External

4.2.1 Book Stores (“Clients”)

4.2.2 Book Stores and Publishers

/PF/	**Process**	Login
	Actor(s)	Book store/publisher
	Category	
	Description	The user logs on with his PIN and password
	Goal	Provide a fully functional system to the user
	Preconditions	Existing account
	Postcondition success	Successful login
	Postcondition failure	Unsuccessful login caused by a wrong PIN or password
	Trigger	Menu Option "Login"
	Sequence	Enter PIN Enter password Validity of data is checked by the System Login successful or display an error message in case of unsuccessful login

/PF/	**Process**	Update account information
	Actor(s)	Book store/publisher
	Category	
	Description	The user is able to edit/update its account information (e.g. address, correspondent etc.)
	Goal	User is able to update changes
	Preconditions	User is logged on
	Postcondition success	Updating the account succeeded
	Postcondition failure	Updating the account failed
	Trigger	Menu option "edit
	Sequence Edit specific data	
		System checks correctness of data (e.g. email format etc.) Submit edited data to the server

/PF/	**Process**	Logout
	Actor(s)	Book store/publisher
	Category	
	Description	User logs out
	Goal	User is logged out
	Preconditions	User is logged in
	Postcondition success	Successful logout
	Postcondition failure	Unsuccessful logout caused by an abort of the user
	Trigger	Menu option "Logout"
	Sequence	User confirms to log out The system terminates the current session

4.2.3 Book Stores (“Clients”)

/PF/	**Process**	Search for a book
	Category	
	Actor(s)	Client
	Description	Client searches for a book to add it to his order
	Goal	Searching for a book succeeded
	Preconditions	Client is logged into the system
	Postcondition success	Book is being found
		Display items and options
	Postcondition failure	Book could not be found
		Display notification
	Trigger	Menu option "find books" (Software)
	Sequence	Enter ISBN/title/author/genre in search bar Hit the "Search"-Button Choose book from list to add it to the order

/PF/	**Process Category**	Book Store Order
	Actor(s)	Book Store Employee
	Description	The Book Store orders a book from BookExpress. This can either happen through a constant connection where every order is individually processed or the store can choose to collect orders internally and send them as one big order every day.
	Goal	Order is placed
	Preconditions	Client is successfully logged into the web interface Connection to BookExpress server is established
	Postcondition success	Order is delivered to BookExpress and added to the order queue
	Postcondition failure	Order is saved as draft and client gets a notification
	Trigger	Menu Option "create new order" (Web interface)
	Sequence	Client adds books to order (via book search or ISBN) Client specifies amount for every book Client submits order to server Order is in the order queue

/PF/	**Process**	Change order
	Actor(s)	Book store
	Category	
	Description	As long as the order is not validated, the user can change information
	Goal	User can correct an order
	Preconditions	Order exists and user is logged in
	Postcondition success	Order information successfully changed
	Postcondition failure	Order information could not be changed because the order is already being validated
	Trigger	Menu option "Change order"
	Sequence	Select order to be changed System checks validity status of the order If not validated, user can change order information Submit changes to the System User receives a confirmation mail

/PF/	**Process**	Cancel Order
	Actor(s)	Book Store Employee
	Category	
	Description	The employee at the book store can cancel the order if it hasn't been shipped yet
	Goal	Current orders can be cancelled
	Preconditions	Order exists
	Postcondition success	Order successfully cancelled. Book Store receives a confirmation mail
	Postcondition failure	Book Store receives a problem report
	Trigger	Menu option "cancel order"
	Sequence	Select order to cancel Check whether order isn't shipped yet Cancel order

/PF/	**Process**	Tracking System
	Actor(s)	Book Store Employee
	Category	
	Description	The employee at the book store can look up at which stage his order is right now, e.g. processing or shipping to BookExpress/the book store.
	Goal	Look up order information/status
	Preconditions	Order exists
	Postcondition success	Employee receives information/status of order
	Postcondition failure	-
	Trigger	Menu option "tracking system"
	Sequence	Select order to track

4.2.4 Publishers

/PF10/	**Process**	Inventory maintenance
	Actor(s)	Publisher
	Category	
	Description	Publishers can update their inventory list (i.e. the list of available books) either via mail or using the direct connection over the web-based interface.
	Goal	Updated inventory list
	Preconditions	Publisher exists
	Postcondition success	Send success mail to publisher
	Postcondition failure	Send problem report to publisher
	Trigger	Menu option "inventory maintenance" (Software) or via mail
	Sequence	Edit inventory list (i.e with TODO book search) Submit list to server

Chapter 5

Product Data

5.1 User Data

5.1.1 Book Stores

/PD20/	**Data**	Book Store Data
	Composition	Name, PIN, Address, Correspondent, E-Mail Address, Phone Number, Contract Data
	Size	approx 10,000
	Traffic	Low

5.1.2 Publishers

/PD30/	**Data**	Publisher Data
	Composition	Name, PIN, Address, Correspondent, E-Mail Address, Phone Number, Contract Data
	Size	approx 15,000
	Traffic	Low

5.2 Order Data

/PD40/	**Data**	Order Data
	Composition	PIN, ISBN, Amount, Price, Date, Current Ordering State
	Size	500,000
	Traffic	Very High

/PD41/	**Data**	Order Data History
	Composition	PIN, ISBN, Amount, Price, Date
	Size	2,500,000
	Traffic	High

5.3 Internal Data

5.3.1 Book Stock

/PD10/	**Data**	Book Data
	Composition	ISBN, UPC/EAN, Title, Author, Publisher, Availability
	Size	approx 1,500,000
	Traffic	Average

5.3.2 Truck Information

/PD50/	**Data**	Truck Fleet Data
	Composition	Driver, Registration Number, Status
	Size	1,000
	Traffic	Average

Chapter 6

Product Performance

6.1 System

/PP10/

Type	System (Web Interface)
Description	The Web Interface should be always reachable during business hours, but also 24/7 for quick changes. The availability outside business hours can be less than 100% but should not fall below 99.7%.

/PP30/

Type	System (Order Processing)
Description	The order processing should always be reachable, confirming (or informing about, in case of error) any order.

/PP40/

Type	System
Description	The System in general should be reliable and responsive all the time, taking not longer than 1-3 seconds for any request.

/PP50/

Type	System
Description	The response time criteria should also be met, when the processing limit of max. 2.000 simultaneous orders is reached.

6.2 Database

/PP20/

Type	Database (DB Connection)
Description	A Connection to the database should never be lost, an average uptime of 99.99% has to be reached to satisfy any part of the system, currently needing data.

/PP21/	**Type**	Database (DB Backup)
	Description	A database backup has to be initiated meeting the guidelines on general backup, also ensuring a consistent and complete history of any processed orders and any critical data.

6.3 Security

/PP60/	**Type**	Security (Stock Availability)
	Description	Stock items should always be able to be ordered, ensuring fast delivery on order.

/PP61/	**Type**	Security (Connection)
	Description	Any connection issued to the system and between system components should be at least encrypted with 256 bit SSL.

/PP62/	**Type**	Security (Database)
	Description	The database should be on an encrypted device, securing personal customer data.

Chapter 7

Quality Requirements

Product Quality	excellent	good	normal	not applicable
Functionality				
suitability		✓		
correctness	✓			
interoperability		✓		
conformity		✓		
security	✓			
Reliability				
maturity		✓		
error tolerance		✓		
re-invoking	✓			
Usability				
comprehensibility		✓		
learnability			✓	
ease of use		✓		
Efficiency				
time behaviour	✓			
resource use			✓	
Maintainability				
easy to analyse		✓		
easy to modify			✓	
stability	✓			
testability				✓
Installability				
adaptability			✓	
easy to install			✓	
conformity		✓		
exchangeability				✓

Chapter 8

User Interface

8.1 Client Application (for clerks)

8.2 Web Interface (for customers)

Chapter 9

Non-Functional Requirements

Chapter 10

Technical Product Environment

10.1 Software

10.2 Hardware

10.3 Orgware

10.4 Interfaces (product)

Chapter 11

Special Requirements for the Development Environment

11.1 Software

11.2 Hardware

11.3 Orgware

11.4 Interfaces (development)

Chapter 12

Subproducts and Subsystems

12.1 Server

12.2 Web Interface / Web Service

12.3 Client Application

Chapter 13

Additional Specifications and Stipulations

Chapter 14

Appendices