

The Book Store Information Engineering Report

by Brandon Gorman

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The Book Store Information Engineering Report

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Abstract

This report highlights the processes taken in designing, developing and testing the information management system titled: The Book Store. This report will depict the entity relationship diagrams (ERDs) showing the entities and the relationships between them. This report will also show the logical design and how it represents the user requirements. This report will then continue on to the software implementation, where the user requirements and ERD design are acted upon.

User Requirements and Design

Developing an information management system (IMS) can be broken down into seven key areas:

The Feasibility Study, Requirements Engineering, Design, Development, Testing and

Implementation. This is also referred to as the System Development Lifecycle. An information engineer's role in the cycle is to take the user requirements developed by The Book store (client) and the business analysts, and to design the datastores, processes and interfaces supplied by the requirements document. The client in this case highlighted the following:

- Database should be menu driven.
- Ability to query information. – Particular titles and rare first editions.
- Add and delete information.
- View customer, book, stock and customer details.
- Ongoing customer orders.
- Print out relevant reports.

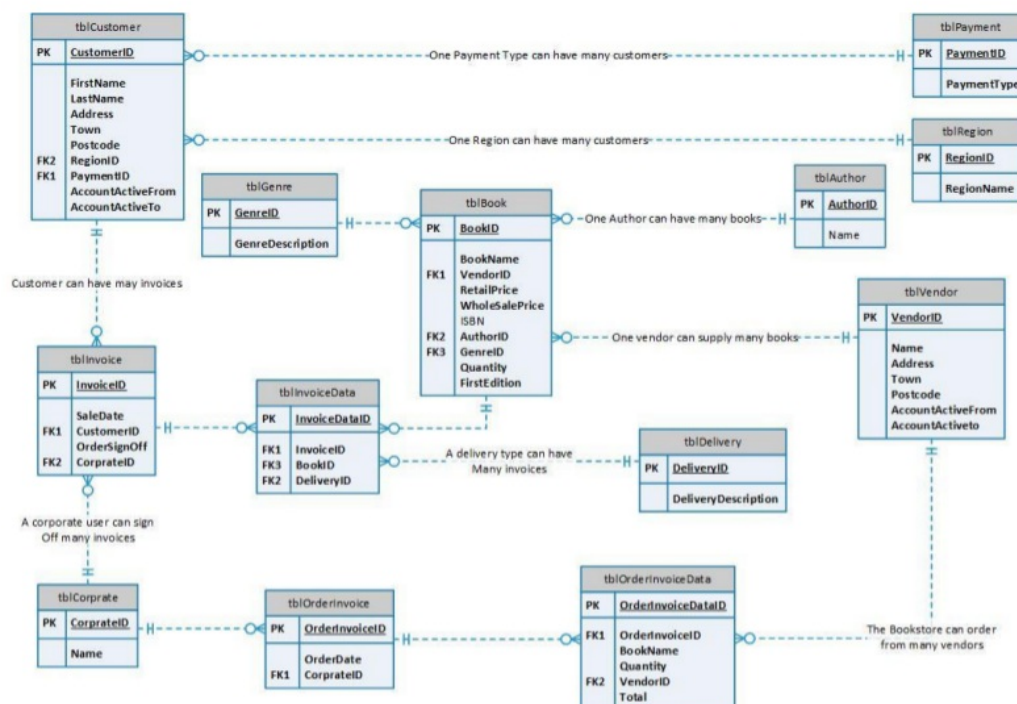
Taking the requirements into consideration it is clear that the following information will need to be stored.

Firstly, customer details. The customer is the prime driver of the store. The store generates its revenue from them. It is important that key information on the customer is held. A unique identification number, names, address, postcode, region (Wales, England etc.), payment type, and the date they became a customer. These are key examples of the demographic's businesses require. This in the future can be used in data analysis to locate trends and allow businesses to capitalise on them.

Secondly, the books. The books as the main product are important. Just like the customer details the book table must also hold relevant information. A unique identification number, the vendor, retail price, wholesale price, ISBN, genre, quantity in stock and whether or not it's a first edition. Next, the invoice. The invoice won't just be for the customers but for the store to. To keep tabs on stock purchased. This can then be used by other stakeholders such as the finance team to analyse, to aid in decision making.

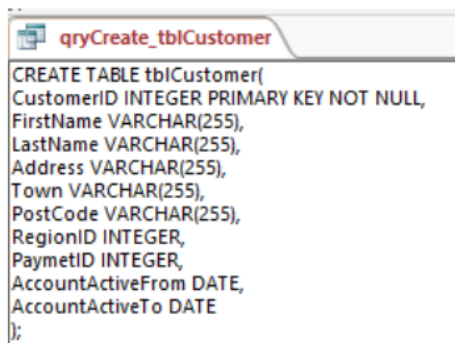
Finally, the delivery type. Click and collet or delivery. This will assist staff on timetables and financial management. This will also assist IT Service Managers and Business Transformation specialists in making decisions to continually promote and implement service improvement.

For this system to work correctly the database must be set up as a relational database. The below ERD shows the information being stored and how each table relates to each other.

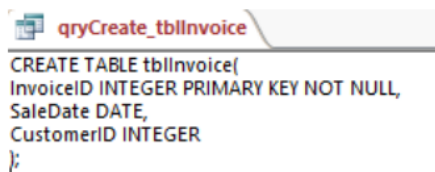


Software Implementation

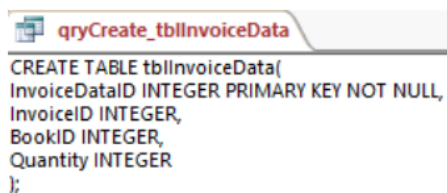
The first step to implementing the proposed solution is to develop the tables. The most logical way of doing this is by designing the tables using a query. Examples below:



```
CREATE TABLE tblCustomer(  
CustomerID INTEGER PRIMARY KEY NOT NULL,  
FirstName VARCHAR(255),  
LastName VARCHAR(255),  
Address VARCHAR(255),  
Town VARCHAR(255),  
PostCode VARCHAR(255),  
RegionID INTEGER,  
PaymetID INTEGER,  
AccountActiveFrom DATE,  
AccountActiveTo DATE  
);
```



```
CREATE TABLE tblInvoice(  
InvoiceID INTEGER PRIMARY KEY NOT NULL,  
SaleDate DATE,  
CustomerID INTEGER  
);
```



```
CREATE TABLE tblInvoiceData(  
InvoiceDataID INTEGER PRIMARY KEY NOT NULL,  
InvoiceID INTEGER,  
BookID INTEGER,  
Quantity INTEGER  
);
```

Using the entity relationship diagram, thirteen queries will be used which will produce thirteen unique tables.

The information system will also use a user forms, the user forms goal is to bring simplicity to the system. This way no SQL knowledge will be required. This additionally, meets the client's user requirements.

The tables structured relationships will allow for authors to be related to multiple titles. Reports can then be generated pulling this data out.

Report Outputs, User Forms and Relationship Diagram

The screenshot shows a window titled "Weekly Order Report". Inside, there is a form titled "Weekly Orders" with a timestamp "27 April 2020 11:48:36". The form has four input fields: "InvoiceID" (containing "9"), "SaleDate" (containing "25/04/2020"), "FirstName" (containing "Hayes"), and "LastName" (containing "Cross"). Below these fields is a large green rectangular area. At the bottom left of the form, there is a "Total Orders" label next to a small input field containing the number "1". At the very bottom of the window, a status bar displays "Page 1 of 1".

Customer Delivery History

Delivery History							
27 April 2020 11:49:53							
InvoiceID	SaleDate	CustomerID	FirstName	LastName	Address	Town	PostCode
5	30/03/2020	24	Carter	Copeland	P.O. Box 821, 9536 Enim Av.	Bayswater	5839
6	30/03/2020	31	Macaulay	Best	874-1343 Auctor St.	Mannekenvere	99368-162
2	29/03/2020	23	Mohammad	Bernard	P.O. Box 563, 9166 Eleifend Avenue	Ajmer	40806
2	29/03/2020	23	Mohammad	Bernard	P.O. Box 563, 9166 Eleifend Avenue	Ajmer	40806
2	29/03/2020	23	Mohammad	Bernard	P.O. Box 563, 9166 Eleifend Avenue	Ajmer	40806
4	29/03/2020	101	Billy	Ball	64 Zoo Lane	London	SW1 ONN
4	29/03/2020	101	Billy	Ball	64 Zoo Lane	London	SW1 ONN
7							

Page 1 of 1

Store Orders

Store Orders							
27 April 2020 11:52:03							
Corporate ID	1						
Name	Brenda Davies						
Order Invoice ID	Order Date	Book Name	Quantity	Retail Price			
2	30/03/2020	A Great Expectations	5	£12.00			
Total	£60.00						
Vendor Name	Address	Town	PostCode				
O'Reilly Media	1005 Gravenstein Highway North Sebastopol, CA	London	95472				

Corporate ID	3						
Name	Brandon Tibbleton						
Order Invoice ID	Order Date	Book Name	Quantity	Retail Price			
3	30/03/2020	The Kingdom of Dreams	5	£9.99			
Total	£49.95						
Vendor Name	Address	Town	PostCode				
DK	80 Strand	london	WC2R 0RL				

Corporate ID	3				
Name	Brandon Tibbleton				
Order Invoice ID	Order Date	Book Name	Quantity	Retail Price	

Main Menu

The Book Store: Main Menu

View Customer List

View Vendor List

View Author List

View Book List

View Invoice List

View Genre List

Add New Customer

Add New Vendor

Add New Author

Add New Book

Add New Book Genre

Shop for Books

Request Book

Order Sign Off

Search for a book

Weekly Customer Order

Delivery History

Click and Collect History

Store Order List

Customer Details

Customer Details

CustomerID

1

FirstName

Brett

LastName

Sullivan

Address

893-933 Adipiscing Ave

Town

Nizip

PostCode

269495

Region Name

Wales

PaymentType

Credit Card

AccountActiveFrom

29/03/2020

AccountActiveTo

Record: 14

1 of 54

No Filter

Search

Vendor Details

Vendor Details

VendorID

1

Name

O'Reilly Media

Address

1005 Gravenstein Highway North Sebastopol, CA

Town

London

PostCode

95472

AccountActiveFrom

04/03/2020

AccountActiveTo

BookID	BookName	RetailPrice	WholeSaleP	ISBN	AuthorID	GenreID
2	Head First Java	£60.00	£45.55	978-1-449-3401	5	
3	Head First C	£60.00	£45.55	978-1-449-3995	4	
*	(New)					

Record: 14 1 of 2

Record: 14 1 of 7

No Filter

Search

Author Details

Author Details

AuthorID

1

Name

QA

BookID	BookName	VendorID	RetailPrice	WholeSaleP	ISBN	GenreID
*	(New)					

Record: 14 1 of 1

Record: 14 1 of 10

No Filter

Search

The screenshot shows the 'frmBook' application window. The title bar includes the application name and standard Windows window controls. The main area is titled 'Book Details' and contains a form with the following fields and values:

Field	Value
BookID	1
BookName	The Trial
VendorID	6
RetailPrice	£7.99
WholeSalePrice	£5.00
ISBN	978-0-241-37256-2
AuthorID	6
GenreID	1

A 'Save' button with a floppy disk icon is located to the right of the form fields. At the bottom of the window, a status bar shows 'Record: 1 of 13', navigation icons, 'No Filter', and a 'Search' button.

[illegible]

Book Genres

New Book Genre

GenreID

1

GenreDescription

Fantasy

BookID	BookName	VendorID	RetailPrice	WholeSaleF	ISBN	AuthorID	Quantity
1	The Trial	6	£7.99	£5.00	978-0-241-3725	6	100
5	Alice in Wonde	3	£10.00	£4.99	978-1-7848-701	8	100
6	The BFG	4	£5.00	£15.00	978-0-1413-642	7	5
7	James and the	4	£10.00	£5.00	978-0-141-3498	7	100
8	Harry Potter	4	£10.99	£7.99	978-0-747-5327	9	100

Record: 1 of 5No FilterSearch

Record: 1 of 5No FilterSearch

Add New Customer

Add New Customer

CustomerID

(New)

FirstName

LastName

Address

Town

PostCode

Region Name

PaymentType

AccountActiveFrom

AccountActiveTo

The screenshot shows the 'Add New Author' window. It has a title bar with standard Windows controls. The main area has a light green background. At the top left is a small icon of a bookshelf. Below it are two input fields: 'AuthorID' containing '[New]' and 'Name'. Below these is a table with columns: BookID, BookName, VendorID, RetailPrice, WholeSaleF, ISBN, and GenreID. The first row of the table is highlighted in blue and contains '(New)' under BookID. Below the table is a record control bar showing 'Record: 1 of 1', navigation icons, 'No Filter', a search box, and a page number field. At the bottom are two large buttons: one with a purple book icon and another with a blue arrow icon. The status bar at the very bottom repeats the record information and search controls.

Add New Book

Add New Book

BookID

(New)

BookName

VendorID

RetailPrice

WholeSalePrice

ISBN

AuthorID

GenreID

Record: 1 of 1

No Filter

Search

Add Book Genre

New Book Genre

GenreID

(New)

GenreDescription

BookID	BookName	VendorID	RetailPrice	WholeSaleP	ISBN	AuthorID	Quantity
(New)							0

Record: 1 of 1

No Filter

Search

Order Book

Order Book

OrderInvoiceID

(New)

OrderDate

Name

OrderInvoice	BookName	Quantity	RetailPrice	VendorID	Total
*	(New)		£0.00		

Record: 1 of 1

No Filter

Search

Record: 1 of 1

No Filter

Search

Shop and Invoice

Shop and Invoice

InvoiceID

(New)

Sale Date

CustomerID

Invoice Information

BookID	Quantity	DeliveryID	BookName	RetailPrice	Total
*					

Record: 1 of 1

No Filter

Search

Total Price

Record: 1 of 1

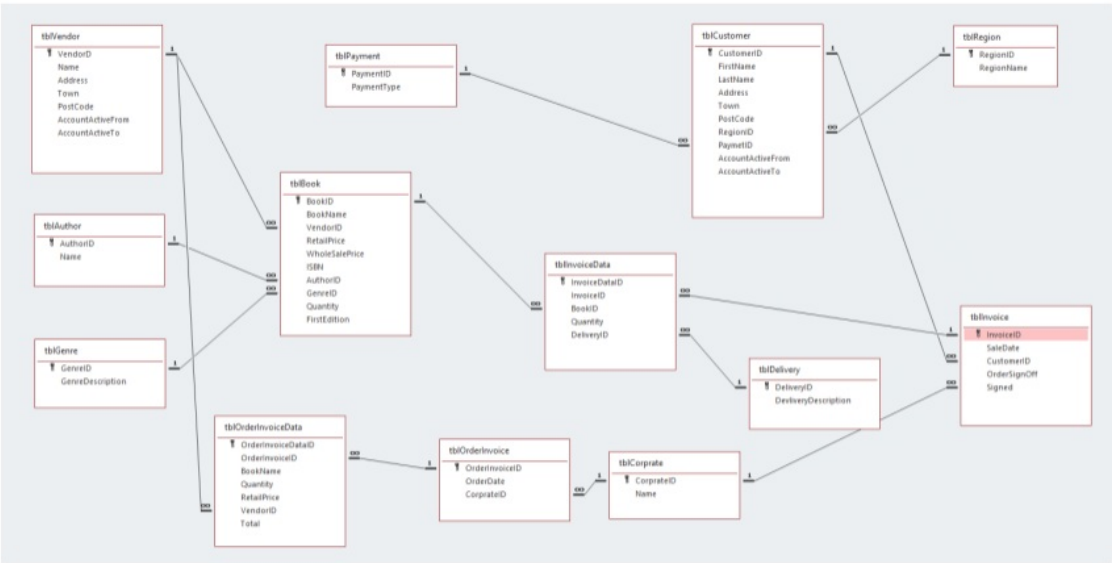
No Filter

Search

The screenshot shows a web application with a search interface. At the top, there is a header bar with the text "Search for a Book". Below this, there is a search form with a text input field containing "Head" and a "Search" button. Below the search form, there is a table with the following data:

Book Name	Head First JavaScript Programming
Head	Head First Java
Head	Head First C
Head	

At the bottom of the screenshot, there is a status bar showing "Record: 1 of 2" and a "Filtered" button.



User Guide

The Main Menu

The user will be greeted with the IMSs main menu automatically when opening the application. The user will have the ability the use the multiple functions available to them.

View Lists

The IMS users will have the ability to view current customers, vendors, authors, genres and invoice lists that are currently active. As the name suggests the lists a in view mode meaning no amendments can be made. This tool can be used to assist staff in outstanding invoices,

current stock levels as well as titles the store currently holds. Users can then move on and add a new book etc. if required. To view list simply click of the relevant button. The user will then be presented with a live list. Please refer to Figure 2.

Adding Forms

The IMS users have the ability also have the ability to add new users, books, authors, genres etc. to the IMS. For the user to do this they must select the relevant button for example “Add new Customer”. The user will be presented with a pop-up box. This popup box will then prompt the user to fill in the fields as appropriate. Certain fields such as the CustomerID can’t be changed by the user. This is auto generated by the IMS database. This unique number will follow



Figure 1 IMS Main Menu

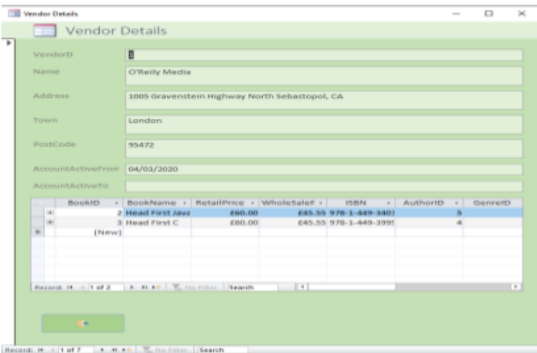


Figure 2 View List

the customer from account creation to account closure. It is important to note that the user clicks save after filling in the form. This confirms the new data entry and the IMS will then generate the relevant details across the system. Please refer to Figure 3 for an example of a new user application form

Figure 3 IMS New Customer

Shopping and Invoicing

Customers will want to purchase books. For an IMS user to do this, they must first select “Shop for books” button. Please refer to Figure 1 for a visual representation. After selecting “Shop for books” the user will be greeted with the below screen:

Figure 4 Shop and Invoice

The above image shows a user input form. This form will record the purchase information. The IMS will generate a new invoice number. The IMS user will then be asked to fill in the sale date, select the customer. This can be done by using the customer dropdown.

The IMS user can use the table drop down to select the book, type the quantity and the delivery type. The IMS logic will then calculate the total cost. All items exclude VAT.

Please find an example of the invoice system in use. This system can allow multiple purchases of a single item as well as the purchase of multiple items.

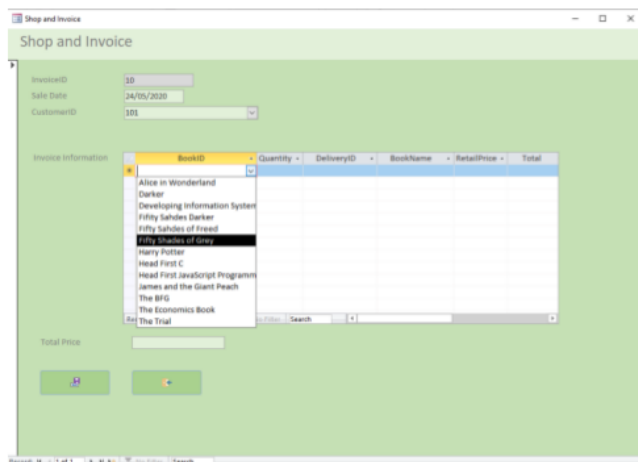


Figure 5 Selecting an item

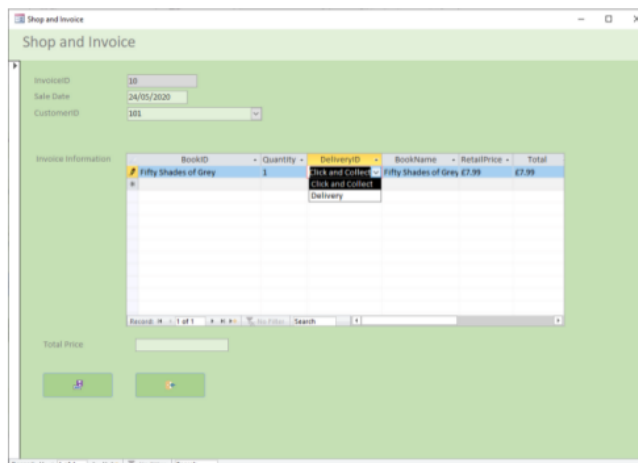


Figure 6 Selecting a delivery type

Shop and Invoice

InvoiceID: 10
Sale Date: 24/05/2020
CustomerID: 101

BookID	Quantity	DeliveryID	BookName	RetailPrice	Total
Fifty Shades of Grey	1	Click and Collect	Fifty Shades of Grey	£7.99	£7.99
Developing Information System 3	1	Deliver	Developing Inform	£13.99	£13.99

Record: 1 of 2 of 2

Total Price: £7.99

Figure 7 Selecting a different delivery type

Along with the system informing the user of the price. It informs the user after clicking save of the Total. In this example: £105.92. Please refer to Figure 8.

Record: 1 of 2 of 2

Total Price: £105.92

Figure 8 Total generated

Viewing Reports

To view any of the reports, simple click on the relevant report from the ISM main menu (Figure 1). You will be displayed with a new window with the report. Scrolling down to the bottom will

enable to user to print the report out if required. Please find an example of the print function below.

The screenshot shows a web application window titled 'Store Orders'. It displays two order entries. The first entry is for Brandon Tibbleton, Corporate ID 3, with an order invoice ID of 4, dated 30/03/2020, for 50 units of 'ITIL: Service Management' at a retail price of £10.00. The total for this order is £500.00. The vendor is TSO, located at 68 - 69 Bull Street, Birmingham, London, with post code B46 AD. The second entry is for Sally Andrews, Corporate ID 5, with an order invoice ID of 5, dated 25/03/2020, for 40 units of 'SQL For Dummies' at a retail price of £12.99. The total for this order is £519.60. The vendor is Collins, located at 40 Great Portland Street, London, with post code W1W 7ND. At the bottom of the report, the 'Total Stock Bought' is £1,129.55. A green 'Print Report' button is visible below the total. The page is labeled 'Page 1 of 1'.

Order Invoice ID	Order Date	Book Name	Quantity	Retail Price
4	30/03/2020	ITIL: Service Management	50	£10.00
Total				£500.00

Vendor Name	Address	Town	PostCode
TSO	68 - 69 Bull Street, Birmingham	London	B46 AD

Order Invoice ID	Order Date	Book Name	Quantity	Retail Price
5	25/03/2020	SQL For Dummies	40	£12.99
Total				£519.60

Vendor Name	Address	Town	PostCode
Collins	40 Great Portland Street, London	London	W1W 7ND

Total Stock Bought: £1,129.55

[Print Report](#)

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Figure 9 Store Report with Print function

The Book Store Information Engineering Report

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

84/100

Instructor

Generic Assessment Criteria Brandon Gorman 84%	Marks available	Marks awarded
1. Engagement with Literature Skills		
2. Knowledge and Understanding Skills		
<i>Suitable development methods employed and justified. Using the above scenario,Functionality</i> You have presented and excellent ERD where you have thought about the structure and the flow of data. Make sure that you are conforming to 3NF and a point to note where you are linking the customer invoice to invoice data we may see data duplication there. However, you demonstrate a very god understanding of the user requirements.	25	19
3. Cognitive and Intellectual Skills		

<i>Provide evidence that the tables will link together in a relational database environment. For this section you should also provide evidence of the design techniques that you have used to develop the database system</i> <i>Understanding of design and SQL</i> You have used SQL well and provided evidence of your table builds through this mechanism. All your table contain suitably planned fields within your record design PK FK links and relational integrity work well. All your tables link together well and adhere to referential integrity rules. You have thought about the fields required and produce very good record structure for your data storage.	20	16
4. Practical Application Skills		

Successful demonstration of software implementation. You are required to implement a database to meet the requirements, attribute field to enhance the design) Forms, Queries, Reports, Relationships, Macros This is an excellent system you have explored all aspect of the DBMS software and use al access object well to build functionality into your system. Your forms have a consistent and user-friendly design. You have tested the system fully and used appropriate queries and report.	45	40
5. Transferable Skills for Life and Professional Practice		

<i>All work suitable presented and referenced.</i> Your work have been presented to a very high standard. You have reflected on the system build and justified your design approach.	10	8
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