

Team Alexandria

Deliverable 4 -

Data Modeling and Starting Design

IS436 - Structured Systems Analysis and Design

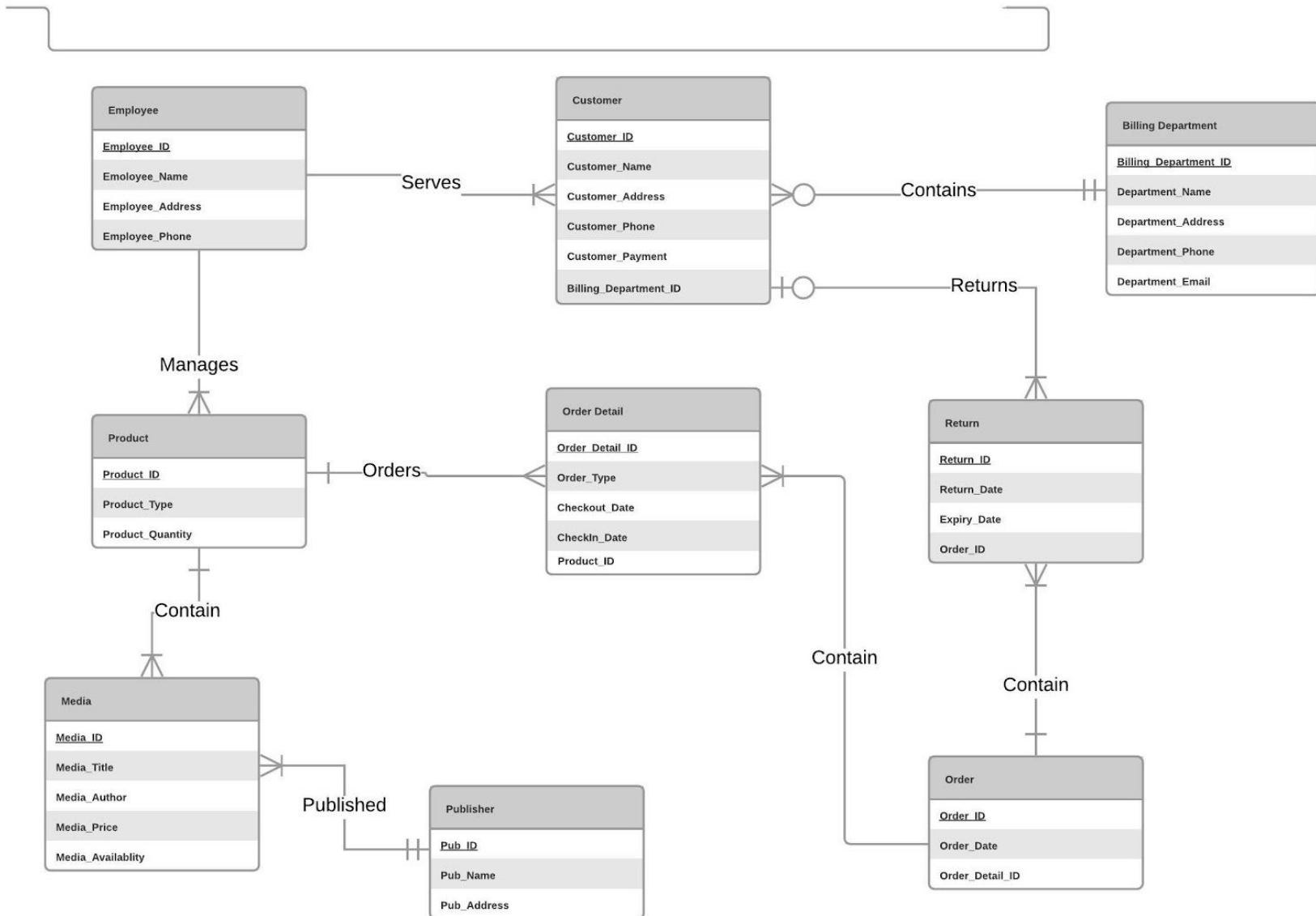
Prepared for May 14th, 2018

Team Members

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ENTITY RELATIONSHIP DIAGRAM

Team Alexandria | May 12, 2018



The three alternatives we choose for the development of our application was complete in-house development which implies not hiring any contractors to work on the development of the web application. Complete outsource of the project to free up in house development team to further develop ideas for the application and the third option was to collaborate with contracted professionals to develop the application. The criteria for evaluation was experience with software, the integration with the legacy system, Cost including organizational costs. While providing a rating for each alternative majority team members had similar scores for each alternative. This made it very difficult to pick one of the three. In the end we simply added the ratings for each alternative and decided to go with the one that had the highest rating by a majority. The alternative that had the highest majority rating was hybrid development of the application. We discussed it after the rating was concluded and felt like having experts that are fluent with many more coding languages implement inhouse ideas would be ideal choice.

Team Matrix

Evaluation Criteria	Relative Importance	Alt 1: In-house Development	Score	Weighted Score	Alt 2: Outsource	Score	Weighted Score	Alt 3: Hybrid	Score	Weighted Score
Technical Issues										
Experience with software	20	Inhouse team lacks complete of knowledge of SQL and HTML	1	20	Contracted developers are experienced in using required languages	4	80	Expert and Inhouse collaboration covers technical and business criteria	5	100
Integration with legacy system	20	Familiarity with legacy system	3	60	Unfamiliar with legacy system and business criteria	3	60	Collaboration to support development with business criteria	5	100
Economic Issues										
Cost	30	minimal cost due to inhouse team	5	150	Major increase in costs	1	30	Significant increase in cost	3	90

Organizational Issues										
Introduction of new system	15	Easy	5	75	Difficult	2	30	Moderate	4	60
Training of employees	15	Little to None	5	75	Extensive Training	2	30	Moderate training	3	45
Total	100			380			230			395

Alt 1: In-house Development

Evaluation Criteria	Relative Importance	In-house Development	Amit	Omar	Jason	Mehak	Alex
Technical Issues							
Experience with software	20	Inhouse team lacks complete of knowledge of SQL and HTML	1	2	1	3	1
Integration with legacy system	20	Familiarity with legacy system	3	2	3	2	3
Economic Issues							
Cost	30	minimal cost due to inhouse team	5	4	5	5	5
Organizational Issues							
Introduction of new system	15	Easy	5	4	5	3	5
Training of employees	15	Little to None	5	4	5	3	5
Total	100		19	16	19	16	19

Alt 2: Outsource

Evaluation Criteria	Relative Importance	Outsource	Amit	Omar	Jason	Mehak	Alex
Technical Issues							
Experience with software	20	Contracted developers are experienced in using required languages	4	4	4	3	1
Integration with legacy system	20	Unfamiliar with legacy system and business criteria	3	3	3	2	2
Economic Issues							
Cost	30	Major increase in costs	1	1	1	5	5
Organizational Issues							
Introduction of new system	15	Difficult	2	2	2	3	4
Training of	15	Extensive Training	2	2	2	3	3

employees							
Total	100		12	12	12	16	15

Alt 3: Hybrid

Evaluation Criteria	Relative Importance	Hybrid	Score	Omar	Jason	Mehak	Alex
Technical Issues							
Experience with software	20	Expert and Inhouse collaboration covers technical and business criteria	5	4	5	5	5
Integration with legacy system	20	Collaboration to support development with business criteria	5	3	5	4	5
Economic Issues							
Cost	30	Significant increase in cost	3	1	3	2	3
Organizational Issues							

Introduction of new system	15	Moderate	4	2	4	3	4
Training of employees	15	Moderate training	3	2	3	3	3
Total	100		20	12	20	17	20

Operational Requirements

Requirement	Definition
Technical Environment	Connected Network of Libraries: The Library system needs to be common for all associated libraries. Allows interlibrary loaning of media. And real time Database updates.
System Integration	System will read and write to database and provide online access to the media resources as well.
Portability	System should be able to operate with mobile devices. Ex. IOS and Android, outside usability (i.e. home computer, etc).

Maintainability	System must be able to accommodate the large amount of media that exists today.
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Performance Requirements

Requirement	Definition
Speed	Network response time \leq 1 second
Capacity	Maximum of 20000 users simultaneous
Availability & Reliability	100% uptime performance

Security Requirements

Requirements	Definition
System Value Estimates	A complete loss of all of our data would cost about \$2 million.
Access Control	Changes can only be made by the right department that has control over the data.
Encryption and Authentication	Data will be encrypted from the user's pc to the website to provide secure data flow. Payment transactions are also protected and encrypted.
Virus Control	All uploaded and downloaded media will be checked for viruses before being saved and computers will all have Security feature enabled.

Cultural/Political Requirements

Requirements	Definition
Multilingual	System will Operate in English, French, & Spanish.
Customization	Users will be able to add media, and download media on the fly.

Making Unstated Norms Explicit	Any restricted media from outside the U.S will be discarded.
Legal	Any personal information will be kept confidential, and copyright rules still apply.

Requirements	Server-Based	Thin Client-Server	Thick Client-Server
Operational Requirements			
System Integration Requirements	ü		ü
Portability Requirements	ü		
Maintainability Requirements	ü		
Technical Environment	ü		ü
Performance Requirements			

Speed Requirements	ü		
Capacity Requirements	ü	ü	
Availability/Reliability Requirements	ü		ü
Security Requirements			
High System Value	ü		
Access Control Requirements	ü		
Encryption/Authentication Requirements	ü		
Virus Control Requirements	ü		
Cultural/Political Requirements			
Multilingual Requirements		ü	

Customized Requirements	ü		
Making Unstated Norms Explicit	ü		
Legal Requirements	ü		

For Operational Requirements, since we need a system of interconnected libraries, a three-tiered Client-Server Architecture would be best suitable because we have different specialized servers where each one handles a different task. The application server will also handle the web-related logic as well. We chose a three tiered client because it can help you update the technology of one tier without affecting the other areas of the application. For example if we want to update our database server, we can do so without slowing down any other communications we might be receiving. We also chose the three tier because we can always add more tiers and continue to scale up. It also will help us maintain code base, where managing presentation code and business logic separately is easily doable.

Hardware and Software Specifications

	Standard Client	Standard Web Application Server	Standard Database Server
Hardware	<ul style="list-style-type: none">· 200GB HDD· Dual Core Processor 1 GHz· Monitor· 1 GB RAM	<ul style="list-style-type: none">· 4TB SSD· Quad Core Processor 3 GHz	<ul style="list-style-type: none">· 20TB SSD· RAID· Quad Core Processor
Operating System	<ul style="list-style-type: none">· Any (IOS, Windows, Linux, etc)	<ul style="list-style-type: none">· Linux	<ul style="list-style-type: none">· Linux
Software	<ul style="list-style-type: none">· Any Web Browser	<ul style="list-style-type: none">· Apache	<ul style="list-style-type: none">· SQL / MariaDB
Network	<ul style="list-style-type: none">· 50 Mbps Ethernet	<ul style="list-style-type: none">· Dual 100Mbps Ethernet	<ul style="list-style-type: none">· Dual 500 Mbps Ethernet

Updated Work Plan:

Task Name	Responsible	Start	End	Days	Status
Sprint 1					
Initiating & Planning	Alex Cha.	2/26	3/5	7	Complete
Gather Info & Analysis	Omar C.	3/2	3/12	10	Complete
Sprint 2					
Plan System Engineering	Amit,Jason	3/15	3/23	8	Complete
Acquire Hardware & Software	Jason,Mehak	3/15	3/30	15	Complete
Installation	Amit,Alex	3/30	4/9	10	Complete
Implementation	Omar, Mehak	4/9	4/19	10	Complete
Sprint 3					
Prepare and Provide Training	Alex Cha.	4/9	4/24	15	Complete

Provide Support	Amit D.	4/24	5/1	7	Complete
Monitor Data	Omar C.	4/24	5/1	7	In progress
Testing	Omar C.	4/24	5/4	10	In progress
Sprint 4					
Document System	Mehak C.	4/24	5/5	11	Not started
Continuous Resolving of Issues	All	5/5	12/1	210	Not started