



Lumico

A Project by
Clutch City Tech Solutions

CIS 4375 Fall 2020

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Introduction

Daniel Howard

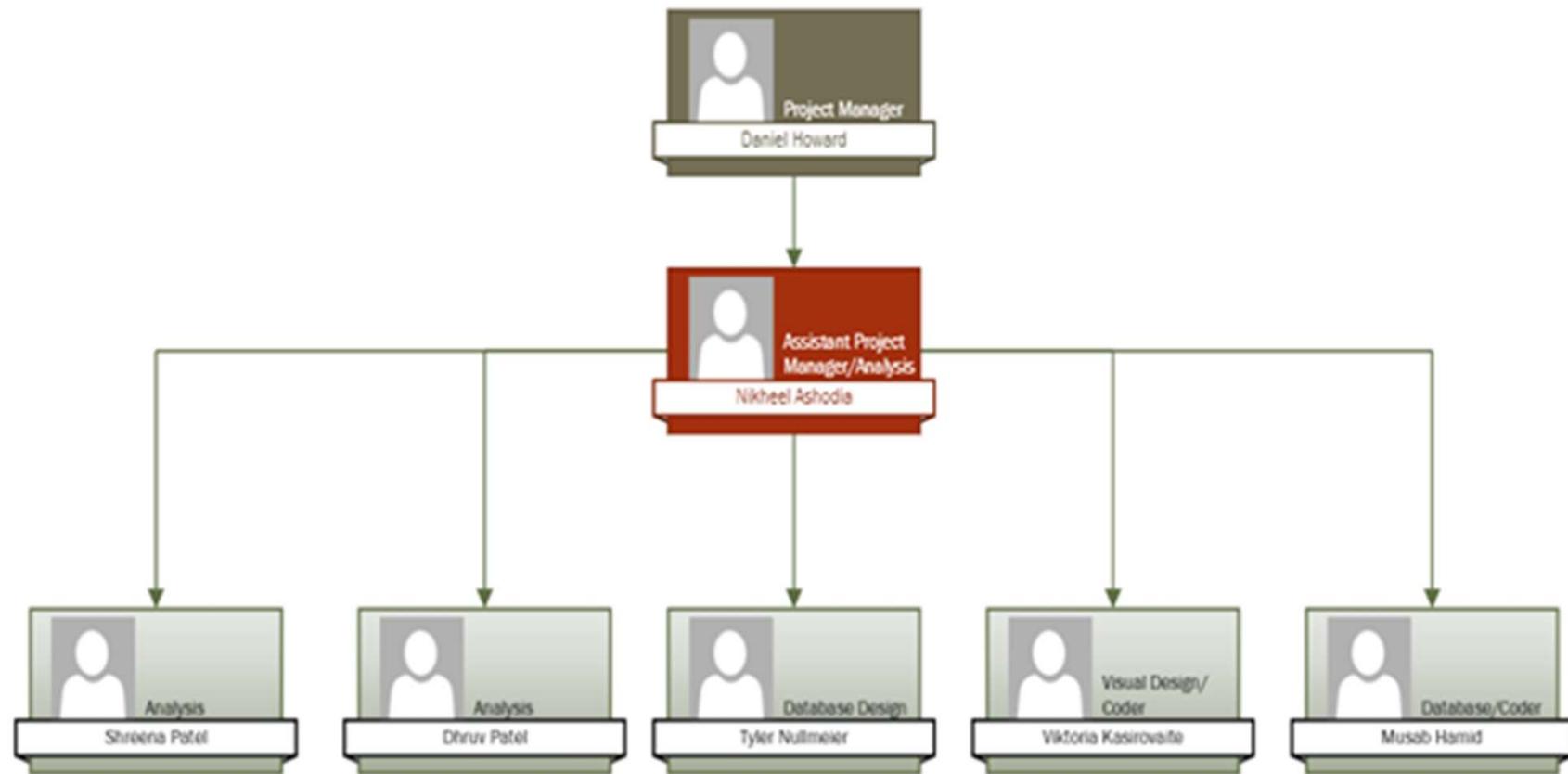
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- *Project Manager* – Daniel Howard
- *Assistant Project Manager* – Nikheel Asodia
- *Business Strategist/Financials* – Dhruv Patel
- *Business Strategist/Analyst* – Shreena Patel
- *Senior Software Development/Testing* – Musab Hamid
- *Senior Software Development/Testing* – Tyler Nullmeier
- *Software Development/Visual Design* – Viktorija Kasirovaite



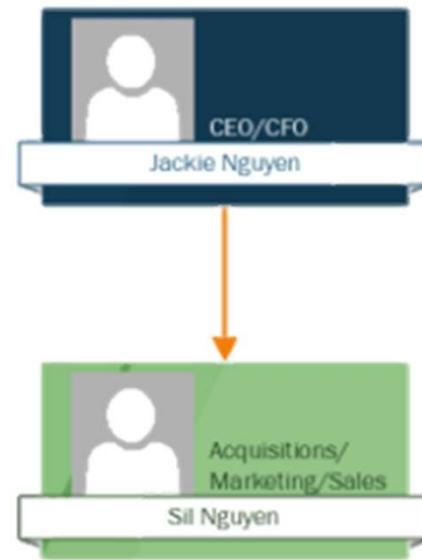
Organizational Chart





Client Background Part 1

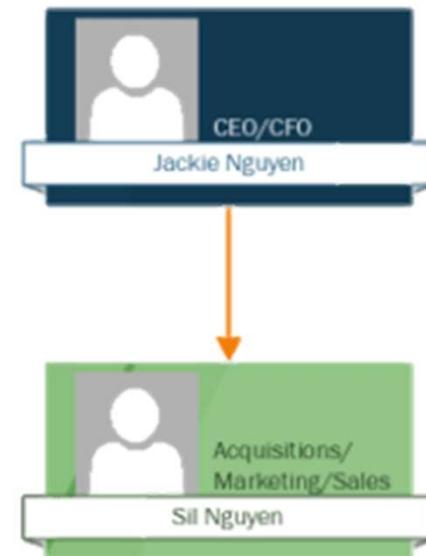
- Lumico is a small start up company
- Founded in July 2019
- Co-owners are Sil and Jackie Nguyen
- Based in Houston, TX
- Inventory is men's, women's, and children's apparel
- The decision was made to operate as a virtual storefront



Lumico

Client Background Part 2

- Data originally managed inefficiently
- Example - excel sheets and paper trails
- Due to pandemic, operations were put on hold
- June 2020 - decision to move forward with the project
- This brings in Clutch City Tech Solutions



Lumico and CCTS Collaboration

- September of 2020 – first meeting
- In attendance - CCTS project manager Daniel Howard and Lumico co-owners
- Client outlined what they needed for their business
- Daniel brought back the requirements for discussion
- CCTS team discussed potential options
- Clutch City and Lumico agreed to project goals

Lumico

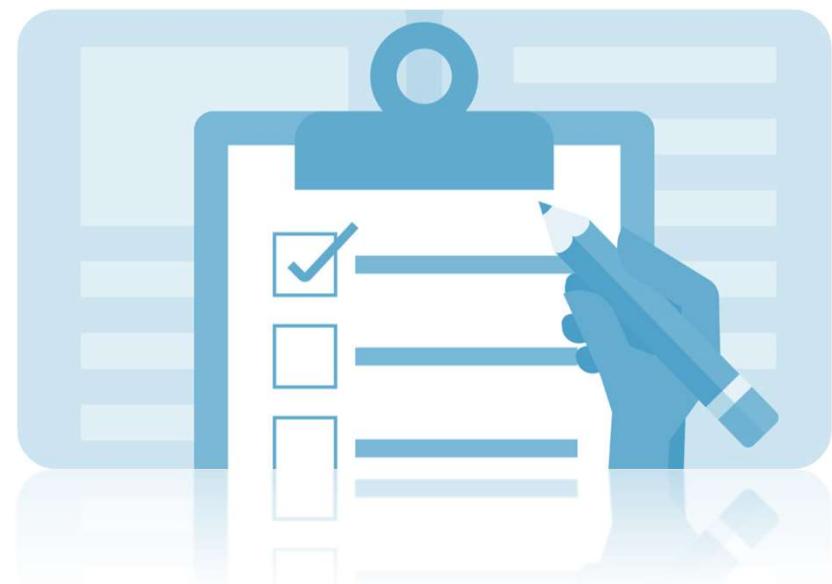


SWOT Analysis

Strengths <ul style="list-style-type: none">• Focus on quality of work• Good business sense• Low overhead• Loyal and hardworking staff• Well qualified	Weakness <ul style="list-style-type: none">• Not able to search records quickly• Information and records not organized in one place• Information is sometimes misplaced or lost• Lack of overall technical organization
Opportunities <ul style="list-style-type: none">• Increase of media outreach• Sales events, products to content creators or social media influencers.• Fast and reliable shipping.	Threats <ul style="list-style-type: none">• Loss of funding• Lack of technology implementation• Loss of data because of disorganization• Unable to secure suppliers

Project Objectives

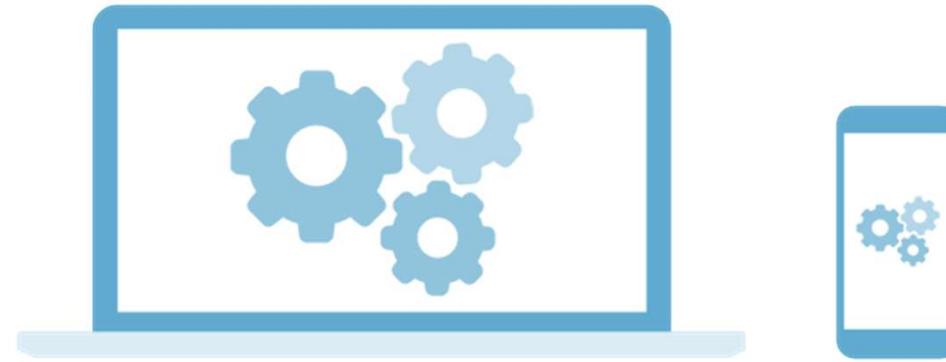
- Objective = create a web application for Lumico
- Storefront management
- Ability to track transactions
- Client can generate income
- Manage employee, inventory, and customer information



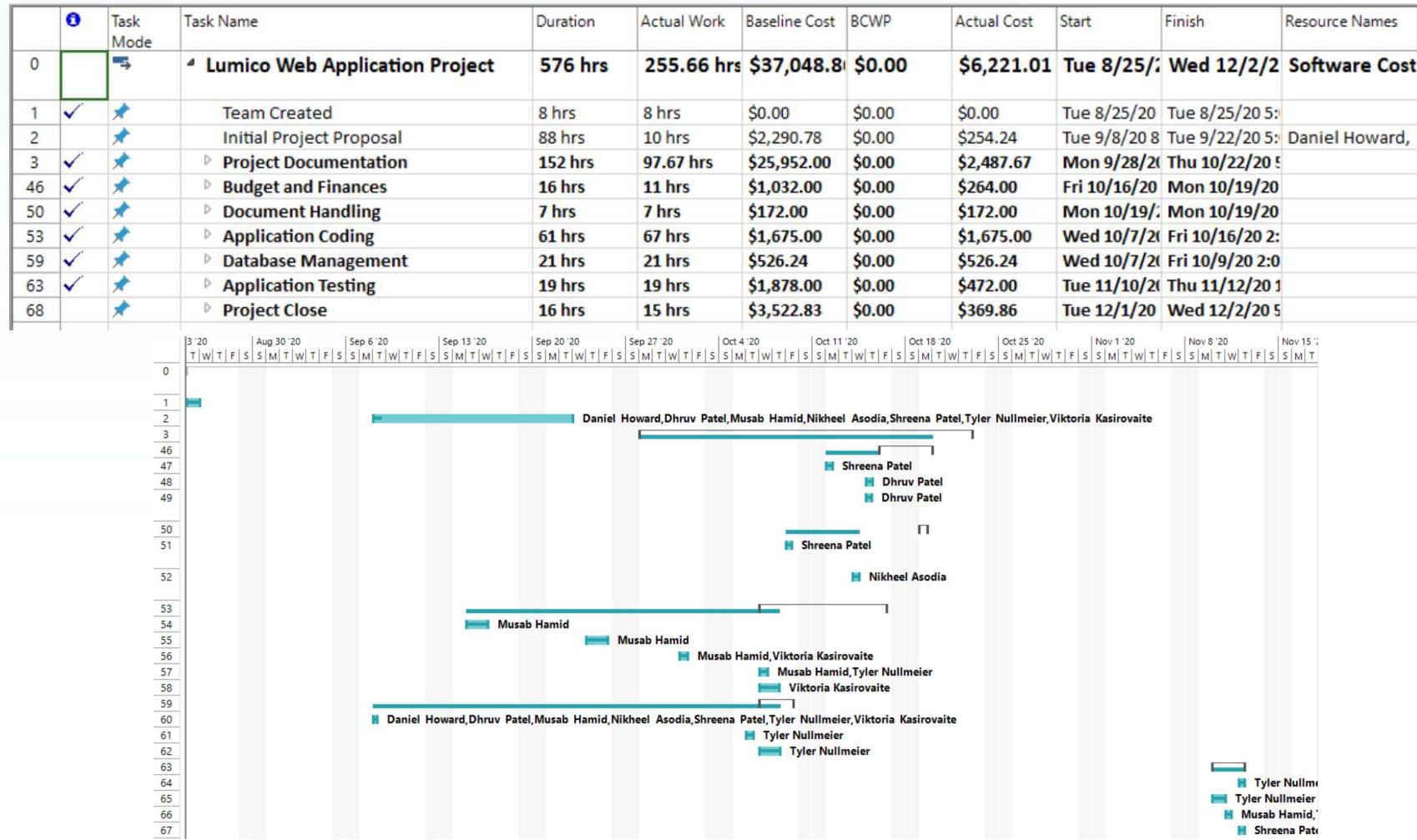
Project Goals

What the finished application/project should include:

- Smooth transition to digital
- Display of inventory on the storefront
- Customer ability to browse/purchase items
- Client ability to manage employees
- Ability to run reports (suppliers, inventory, and orders)
- Full testing for any bugs

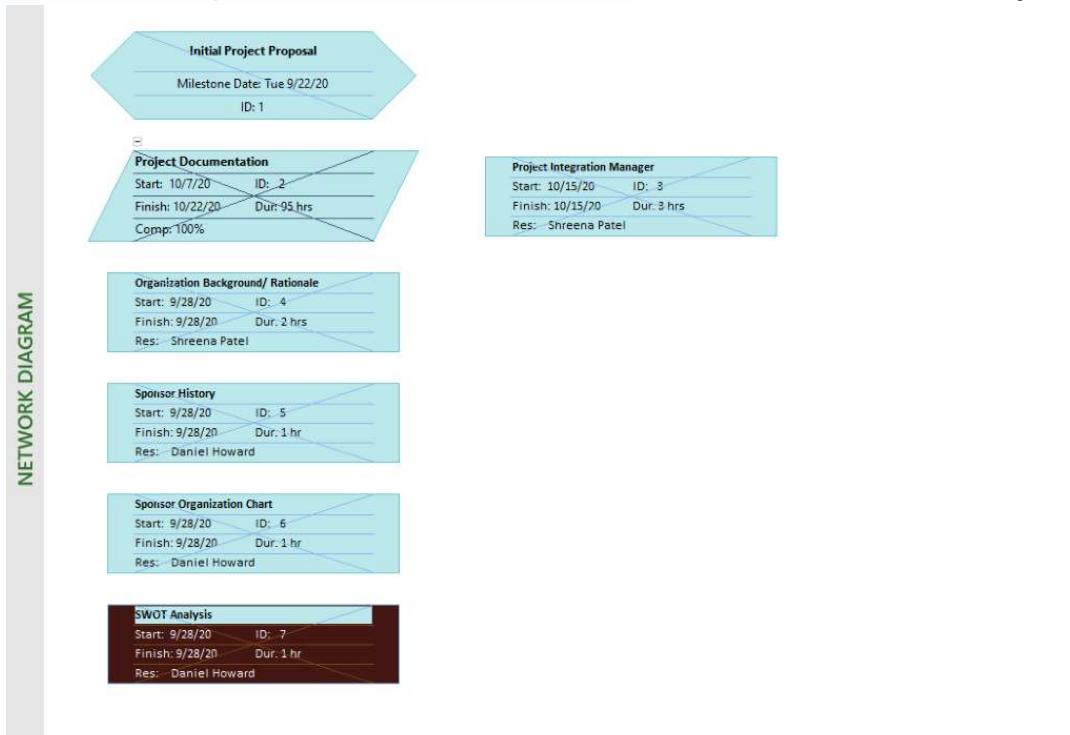


Gantt Chart



Pert Chart/Network Diagram

- The network diagram shows tasks and the resources assigned to them
- This is a visual representation of how the tasks are outlined
- ID is assigned based on which part of the Work Breakdown Structure that they belong to.



Milestones

Task	Description	Date Due
Assemble Team	Form a team and distribute roles and responsibilities.	September 1, 2020
Find a Client	Find a client for this project that will help fulfill project requirements.	September 10, 2020
Submit Project Charter	Turn in the Initial Project Proposal/ Project Charter to the PMO, Prof. Gibbs, for review	September 20, 2020
Application Prototype and Database Sample	Have application prototype and database sample complete for feedback from team	October 1, 2020
Complete Project Execution Plan Version 1.0	Have all documents and application requirements completed and formatted for turn in.	October 19, 2020
Submit Project Execution Plan Version 1.0	Turn in the Project Execution Plan 1.0 and wait for feedback from key stakeholders.	October 20, 2020
Weekly Meeting Status Reports	Complete all project information and present weekly status reports to PMO.	October 27, 2020 November 3, 2020 November 10, 2020 November 17, 2020
Complete Final Execution Plan and System Application	Complete all system testing and debugging and finalize all documents for submission.	November 17, 2020
Submit Final Project Execution Plan	Turn in completed Project Execution Plan and present the project successfully.	November 24, 2020



Stakeholders / Criteria

Nikheel Asodia

Roles and Responsibilities Matrix

Name	Role	Responsibilities
Daniel Howard	CCT Solutions, Project Manager	<ol style="list-style-type: none">1. Help the project team understand the needs and expectations of stakeholders.2. Facilitate project communications.3. Ensure risk audits are performed.
Nikheel Asodia	CCT Solutions, Assistant manager,	<ol style="list-style-type: none">1. Help the team communicate by creating and distributing meeting minutes.2. Facilitate project communications.
Shreena Patel	CCT Solutions, Business Analyst	<ol style="list-style-type: none">1. Maintaining documentation for system requirements and requests.
Dhruv Patel	CCT Solutions, Quality Analyst	<ol style="list-style-type: none">1. Maintaining documentation for system requirements and requests.2. Establishing budget for developing the application.3. Performing cost-benefit analysis on risk responses.
Viktoria Kasirovaite	CCT Solutions, GUI Developer, Designer, Tester	<ol style="list-style-type: none">1. Maintaining compliance with project data specifications.2. Ensuring the platform is secure and free of defects.3. Maintaining good communications with the project team.4. Migrate project to fallback server if necessary.
Musab Hamid	CCT Solutions, GUI Developer, Designer, Tester	<ol style="list-style-type: none">1. Maintaining compliance with project data specifications.2. Ensuring the platform is secure and free of defects.3. Maintaining good communications with the project team.4. Migrate project to fallback server if necessary.
Tyler Nullmeier	CCT Solutions, GUI Developer, Designer, Tester	<ol style="list-style-type: none">1. Maintaining an accurate representation of all the data that will enter and leave the database.2. Ensuring the platform is secure and free of defects.3. Maintaining good communications with the project team.4. Configure fallback server if necessary.
Sil and Jackie Nguyen	Client, Project Sponsor	<ol style="list-style-type: none">1. Being open and honest about expectations and requirements by giving regular feedback.2. Observing business risks that are escalated outside of the scope of CCT-Solutions' project.

Success Criteria

- Transition from previous documentation to application
- Display and management of products on the storefront
- Customer ability to purchase items
- Ability to manage employee data and run reports
- Completed web application and successful testing



Expected Business Benefits

- Ease of access of documentation
- Efficiency of managing employee information
- Generating revenue from store front
- Ease of managing inventory information
- Automation means saving time



Project Review Committee

Name	Role	Key Responsibilities
Jackie Nguyen and Sil Nguyen	Sponsor	Makes key business decisions for the project, approving budget, communicates the project goals to the project manager.
Thomas Gibbs	Project Manager Office, Director	Overlooks the entire project, sets project requirements and provides feedback.
Daniel Howard	Project Manager	Manages the project deliverables, manages the project schedule, assigns deliverables, provides regular updates to the project manager office manager, manages project budget.
Nikheel Asodia	Assistant Project Manager	Assists the project manager with deliverable management, relays the requests from the sponsor to the rest of the team.

Project Stakeholder Management Plan

Stakeholder	Impact
Project Manager Office Manager – Professor T. Gibbs	The PMO Manager overlooks the entire project and makes sure that everything is completed on time and within the budget and scope of the client and sponsors.
Sponsors – Lumico, Sil & Jackie Nguyen	Lumico's CEO's Sil and Jackie Nguyen, who are also sponsors will fund the project fully and provide timely feedback for the required system for their company.
Clutch City Tech Solutions Team	CCT Solutions will provide the client and PMO Manager with the completed documents and system that meet the project requirements of the two.



Scope / Quality

Viktorija Kasirovaite

Scope Description

- Administrative portal for inventory and employees
- Customer storefront with cart and log-in/sign-up
- Database connectivity for data storage
- Deployment of website online
- Automation of report generating
- Extensive testing for bug repairs

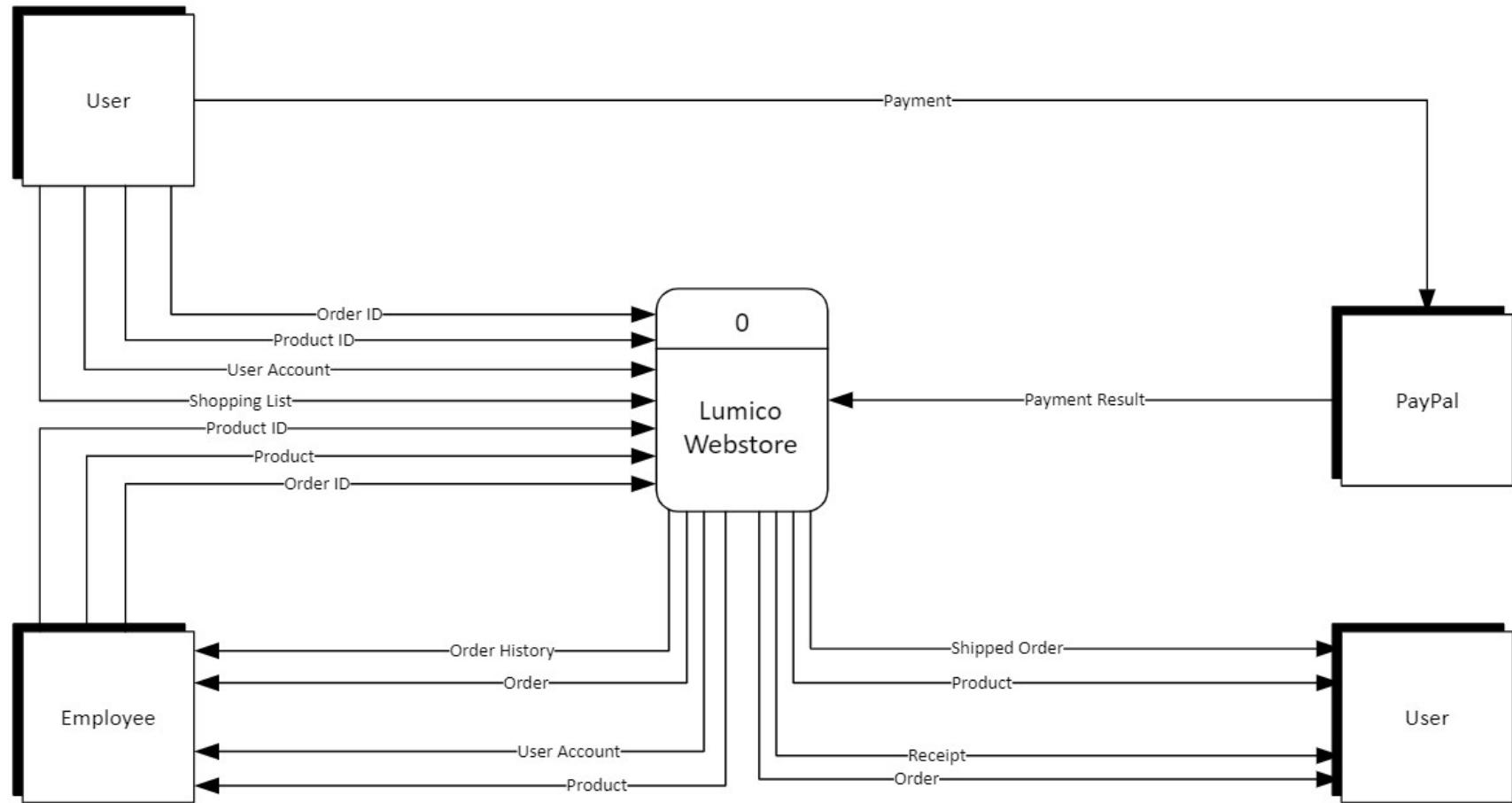


Scope Exclusions

- Any specifications not explicitly outlined
- Ad services for revenue
- Finding suppliers for inventory
- Providing hardware
- Search engine optimization
- Postage



Scope Diagram



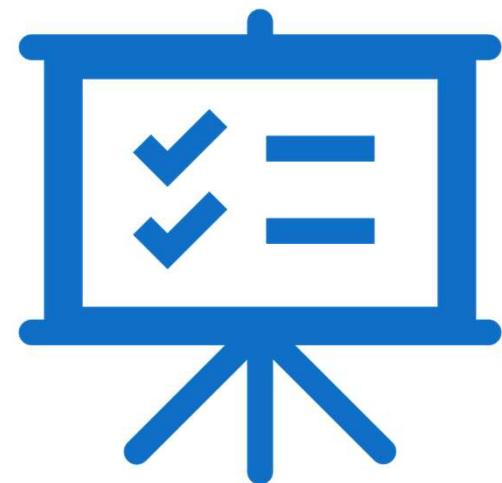
Project Quality Objectives

- Scope includes 2 interfaces
- Store front and administrative interface
- Node, React, Tachyons, Express, and MongoDB
- Aspects of scope fall under scrutiny of testing
- Ex. user interface/experience, CRUD, data integrity, and security



Project Quality Metrics

- A code audit was done each week
- Checked if code follows project scope
- Checklist for automated testing implementation
- Documented the application's major interfaces
- Second metric measured code that was working
- Automated testing ensures changes do not break application



Project Quality Training Requirements

- Training development resembled ADDIE model
- Analysis, Design, Development, Implementation, and Evaluation
- First step = identify if problem can be solved with training
- Second step = Pareto analysis for root causes
- Procedural analysis = identify task completion steps
- Sequenced instruction, developed documentation, implemented design





Communication / Solutions

Shreena Patel

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Project Communication Management

- Group meetings are held weekly
- Typically on Wednesdays at 8:00 PM
- Weekly tasks are assigned by project manager
- Progress of each task is tracked and observed
- Deviance from scope = Project Manager identifies the problem
- Group is reminded about deadlines

We utilized these methods of communication:

- GroupMe
- E-mail
- Zoom
- Microsoft SharePoint
- GitHub



Communication Matrix

Type	Purpose	Medium	Frequency	Audience
Kickoff Meeting	Introduce project and confirm objectives, goals, and deliverables.	Virtual meeting (Zoom Conference Call)	Once	Project Team, Project Sponsor
Identify Team Members and Roles	Defining and understanding each member's role in the project.	Virtual meeting (Zoom Conference Call)	Once	Project Team
Project Team Meetings	Review status of project.	Virtual meeting (Zoom Conference Call)	Weekly	Project Team
Check-ins/meeting recap	Update interested parties on project status based on notes from project team meetings.	Email, SharePoint	Weekly	Project Sponsor
Project Status Meetings	Update leadership on project status and give opportunity to ask questions.	Virtual meeting (Zoom Conference Call)	Monthly	Project Team
GUI Review	Give the project sponsor the opportunity to give feedback on the application design.	Virtual meeting (Zoom Conference Call)	Weekly	Project Sponsor, Project Manager, GUI Designer

Problems vs. Proposed Solutions

Problems

- Lumico had no working application for selling merchandise
- No current database to store crucial data
- Data was previously being entered into Excel



Proposed Solutions

- Web application for customer browsing and purchasing
- Administrative portal for employee and inventory information
- Remote MongoDB database

Benefits / Risks / Timeline and Costs

- **Benefits**

- Cost reduction, due to remote hosting
- Available during non-peak hours
- CCTS is providing services at a reduced rate



- **Timeline and Costs**

- Working application operational within 2 months
- Lumico can generate sales / resume operations
- Total cost of \$45,840, discount of \$45,840



- **Risks**

- Planned/unplanned remote server outages
- Hosting remotely can become expensive
- If Lumico decides to not go with our proposal



Stakeholder Reporting

Purpose	Frequency	Lead	Comments/Participants
Sponsor History	Once	Daniel Howard	Daniel held the virtual meeting and documented it.
Sponsor Organizational Chart	Once	Daniel Howard	Daniel
SWOT Analysis	Weekly	Daniel Howard	The analysis was assisted by Shreena and Dhruv.
Project Goals	Once	Daniel Howard	Daniel held the meeting with the sponsor to define and finalize on the project goals.
Expected Business Benefits	Once	Shreena Patel	Shreena held virtual meeting with the project sponsor to define the success criteria for this project.
Status Reporting	Monthly	Nikheel Asodia	Nikheel emails the reports to the sponsor about the project status.
Meeting	Weekly	Daniel Howard	Sponsor and Project Team
Stakeholder Management Plan	Once	Shreena Patel	Shreena.
Risk and Risk Mitigation	Once	Tyler Nullmeier	Tyler held the meeting with the project sponsor to discuss, finalize and document the risk prioritization.
Project Review Committee	Once	Nikheel Asodia	Nikheel and Daniel finalized with the project sponsor on the review committee.
Risk Management Plan	Once	Tyler Nullmeier	Tyler presented the Risk Management Plan to the stakeholder virtually and documented the final plan.
Business Requirement Plan	Once	Shreena Patel	Shreena finalized and documented the final business requirement plan.
Scope Management Plan	Once	Shreena Patel	Shreena developed the scope management plan after holding the discussions with the sponsor.
Cost Management and Budget Plan	Once	Dhruv Patel	Created and maintained by Dhruv
Proposed Budget	Once	Dhruv Patel	Created and maintained by Dhruv.
Earned Value Worksheet	Monthly	Dhruv Patel	Created and maintained by Dhruv.
Procurement Plan	Monthly	Shreena Patel	Created and maintained by Shreena.
Scope Management Log	Weekly	Shreena Patel	Created and maintained by Shreena.
Project Management Data Storage Plan	Once	Shreena Patel	Created and maintained by Shreena.

Work Breakdown Structure

- The Work Breakdown Structure is used to show the outline of tasks that were scheduled, completed, the amount of time taken to complete, and by whom.

	Task Mode	Task Name	Duration	Actual Work	Start	Finish	Resource Names
1	✓	1 Initial Project Proposal	4 hrs	3.99 hrs	Tue 9/22/20	Tue 9/22/20	Dhruv Patel,Musab Ha
2	✓	2 Project Documentation	95 hrs	95 hrs	Wed 10/7/20	Thu 10/22/20	
45	✓	3 Budget and Finances	11 hrs	11 hrs	Fri 10/16/20	Mon 10/19/20	
49	✓	4 Document Handling	7 hrs	7 hrs	Mon 10/19/20	Mon 10/19/20	
52	✓	5 Application Coding	61 hrs	69 hrs	Wed 10/7/20	Fri 10/16/20	
58	✓	6 Database Management	21 hrs	39 hrs	Wed 10/7/20	Fri 10/9/20	
62	✓	7 Application Testing	19 hrs	19 hrs	Tue 11/10/20	Thu 11/12/20	
67	✓	8 Project Close	16 hrs	14.98 hrs	Tue 12/1/20	Wed 12/2/20	



Critical Assumptions and Constraints

- Due to COVID-19, virtual progress meetings were held
- Each document had a set completion date
- Cost of project = \$45,840, Discount = \$45,840, Final cost = \$0.00
- Key stakeholders were present/available for feedback
- Project is completed in full by November 24th, 2020
- Scope creep and requirements are monitored



Cost vs. Benefits

Cost				
Category	Quantity	Item	Price	Total
Software	1	React	Free	
	1	GroupMe	Free	
	1	Microsoft SharePoint	Free	
	1	Zoom	Free	
	1	Git/GitHub	Free	
	1	PayPal API	Free	
	1	Heroku	Free	
Service	1	Consultantion	\$33,340	UH Discount (\$33340)
	1	Training	Free	
Total Cost:				\$0
Benefits				
Workflow Efficency				\$22,000
Appropriate data storage				\$3,000
Expand Customer Exposure				\$10,775
Total Benefits:				\$35,775

Proposed Project Budget

WBS Items	Type	Role	Max	Std Rate	Total Hours	Cost
1. Project Management						
1.1 Project Manager						
1.1.1 Daniel Howard	Work	Project Manager	100%	\$30.00/hr	200h	\$6,000
1.2 Project team members						
1.2.1 Nikheel Asodia	Work	Assistant Manager	100%	\$26.00/hr	200h	\$5,200
1.2.2 Mushab Hamid	Work	Developer, Tester	100%	\$25.00/hr	180h	\$4,500
1.2.3 Victoria Kasirovaite	Work	Developer, Tester	100%	\$25.00/hr	180h	\$4,500
1.2.4 Tyler Nullmeier	Work	Developer, Tester	100%	\$25.00/hr	180h	\$4,500
1.2.5 Shreena Patel	Work	Business Analyst	100%	\$24.00/hr	180h	\$4,320
1.2.6 Dhruv Patel	Work	Quality Analyst	100%	\$24.00/hr	180h	\$4,320
2. Software						
2.1 Software	Cost	Free	100%			\$0
React		Free				\$0
GroupMe		Free				\$0
Microsoft SharePoint		Free				\$0
Zoom		Free				\$0
Git/GitHub		Free				\$0
PayPal API		Free				\$0
Heroku		Free				\$0
3. Testing						
3.1 Testing Cost	Cost / Work		100%		60h	\$10,000
4. Risk						
4.1 Risk Contingency Plan	Cost		100%			\$2,500
5. Maintenance						
5.1 Maintenance Self Service	Cost/Work		100%			\$0
6. Training						
6.1 Training	Cost	Free				\$0
Total Cost						\$45,840
7. Discount						
7.1 UH Discount						(\$45,840)
Total Cost After Discount						\$0

Earned Value Worksheet



Figure 1. Actual cost of work performed (ACWP) versus the baseline cost of work performed (BCWP)

COST DETAILS

Cost details for all top-level tasks.

Name	Fixed Cost	Actual Cost	Remaining Cost	Cost	Baseline Cost	Cost Variance
Team Created	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Initial Project Proposal	\$0.00	\$254.24	\$2,036.54	\$2,290.78	\$2,290.78	\$0.00
Project Documentation	\$0.00	\$2,487.67	\$0.00	\$2,487.67	\$25,952.00	(\$23,464.33)
Budget and Finances	\$0.00	\$264.00	\$0.00	\$264.00	\$1,032.00	(\$768.00)
Document Handling	\$0.00	\$172.00	\$0.00	\$172.00	\$172.00	\$0.00
Application Coding	\$0.00	\$1,675.00	\$0.00	\$1,675.00	\$1,675.00	\$0.00
Database Management	\$0.00	\$526.24	\$0.00	\$526.24	\$526.24	\$0.00
Application Testing	\$0.00	\$472.00	\$0.00	\$472.00	\$1,878.00	(\$1,406.00)
Project Close	\$0.00	\$369.86	\$304.97	\$674.83	\$3,522.83	(\$2,848.00)

Figure 2. All costs for the project



Application Development

Musab Hamid

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User Interface / Security Requirements

User Interface

- Our development team used React and Tachyons
- This combination = mobile friendly, fast, and responsive.

Security Requirements

- PayPal = payment processing platform
- Heroku = site hosting, with Transport Layer Security (TLS)
- MongoDB Atlas = secure and scalable database connections
- Password requirements implemented



Performance and Capacity

- Need for effective database scaling
- Utilizing a document-based design database
- This will scale well and be more maintainable
- Using MongoDB allowed for MongoDB Atlas hosting
- Easy to scale by paying for more capacity



Migration Requirements

- Transfer Excel data into correct database format
- Export data to csv format and import
- Paper data – use optical character recognition (OCR)
- OCR converts the paper data to a digital format
- If data is correct, import into database as well

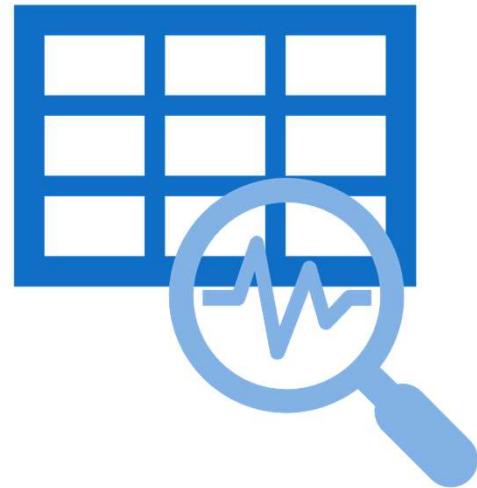


Scope Management Log

Description	Task Status	Date
Data Gathering Meetings	Completed	September 26,2020
Chatter	Completed	September 20, 2020
Execution Plan	Completed	October 20, 2020
Lumico Web Application		
• Administrators		
• New Employee	Completed	November 10,2020
• Update Employee		
• New Vendor		
• Update Vendor		
Employee		
• New Product	Completed	November 10,2020
• Update Product		
• Product List		
Customers		
• Customer Information	Completed	November 10,2020
• Order Information		
Testing	Completed	November 24,2020
Due	Completed	November 24,2020

Project Quality Testing Technologies

- Mocha for unit and data integrity testing
- API testing = node script uses Axios to perform requests
- Test data written to a unique database
- Tests shouldn't run on production database



Testing and Monitoring Methodology

- Five phase testing methodology, performed on a weekly basis

Discovery Phase

- Code audit to identify API endpoints, methods, and classes
- Ensure everything is still in scope

Unit Testing

- Assertion-based Mocha scripts on the express server
- Use server's methods to create, read, update, and delete
- These tests are fully automated and can be launched with npm



Testing and Monitoring Methodology

Integration Testing

- Testing how the web API interacts with external inputs.
- Axios for CRUD testing data using both valid and invalid entries
- Mocha scripts can be leveraged to test data integrity



System Testing

- Takes place in the web browser to see how users interact
- Each type of interaction should be tested

User Acceptance Testing

- Goal is to obtain user feedback regarding fitness for use

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Risk / DFD

Tyler Nullmeier

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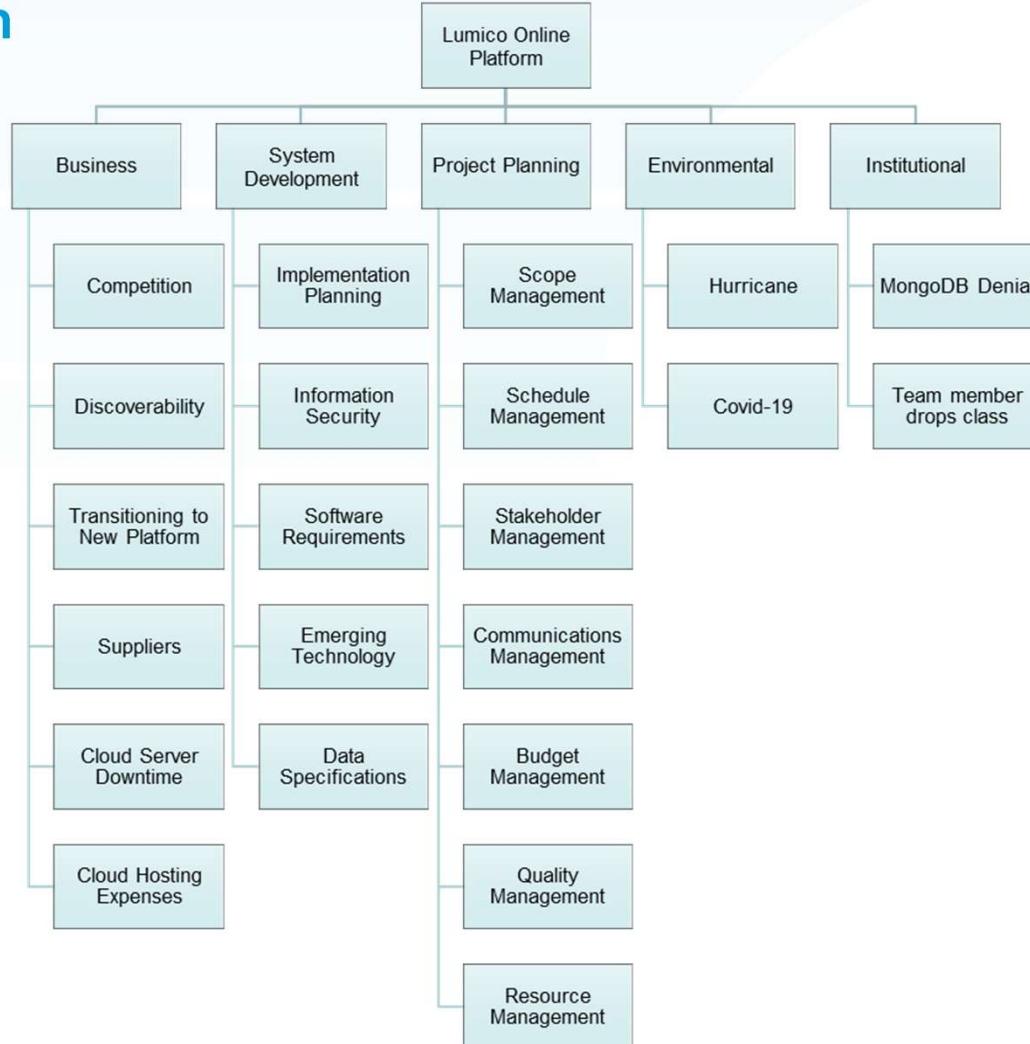
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Project Risk Management

- Utilized a multitude of skills to identify risks
- This includes expert judgement, brainstorming, interviewing, document analysis, and benchmarking
- Tools for detailing/identifying risks
 - Risk Breakdown Structure
 - Qualitative Risk analysis
 - Risk Register and Risk Report
 - Risk Audit



Risk Breakdown Structure



Risk Ranking

- **Risk Score = (**
Probability
+ Impact
+ Proximity
+ 10 - Detectability) / 4
- **Ranking Formula:** 10 - Risk Score



Detectability vs. Proximity. Color shows Risk Score. Size shows Adjusted Impact. The marks are labeled by Risk and Risk Score. Details are shown for Risk Number.

Top 10 Risks

Risk	Rank This Week	Rank Last Week	Number of Weeks in Top Ten	Risk Resolution Progress	Potential Responses
Implementation Planning	1	1	6	Detailed plans are being formed.	Everyone on the team brainstorms issues that could occur due to our planned implementation.
Data Specifications	2	2	6	The data dictionary has been defined and will be updated as needed.	Ensure that a detailed data dictionary is defined early.
Covid-19	3	3	5	All team members have undergone training to help them prevent the spread of Covid-19.	Avoid exposure to the virus as much as possible: take precautions during everyday life like wearing a mask in public, maintaining a distance of 6-15 feet from others when possible, washing hands thoroughly, and observing recommendations made by health experts.
Communications Management	4	5	6	The team will increase communication frequency with more meetings and status reports.	Team members are assigned deliverables they are responsible for and constantly communicate their progress and approaches.
Cloud Server Downtime	5	6	3	The service level agreement was reviewed to find that Amazon Web Services claims 99.99% uptime with incident remediation.	Seek incident remediation.
Resource Management	6	7	6	More team members are being included in the development process.	Include other members of the team in web development discussions so that they have the knowledge they need to contribute if needed.
Cloud Hosting Expenses	7	8	3	Capacity planning considerations will be included in the technical manual.	Keep a close eye on resource requirements and plan to increase capacity in the future.
Competition	8	9	6	Lumico's management is looking into search engine optimization strategies and targeted advertising.	Lumico could keep a lean selection of highly curated products to target niche markets that are willing to go out of their way to find what they want.
Emerging Technology	9	10	6	Stable technologies have been selected.	Only use software distributions that have a proven record.
Scope Management	10	0	0	The most important scope items have been completed, lower priorities items will be added as time allows.	Use a phased approach to project execution where lower priority requirements are added only after higher priority items are completed.

Contingency Plan for Highest Priority Risk

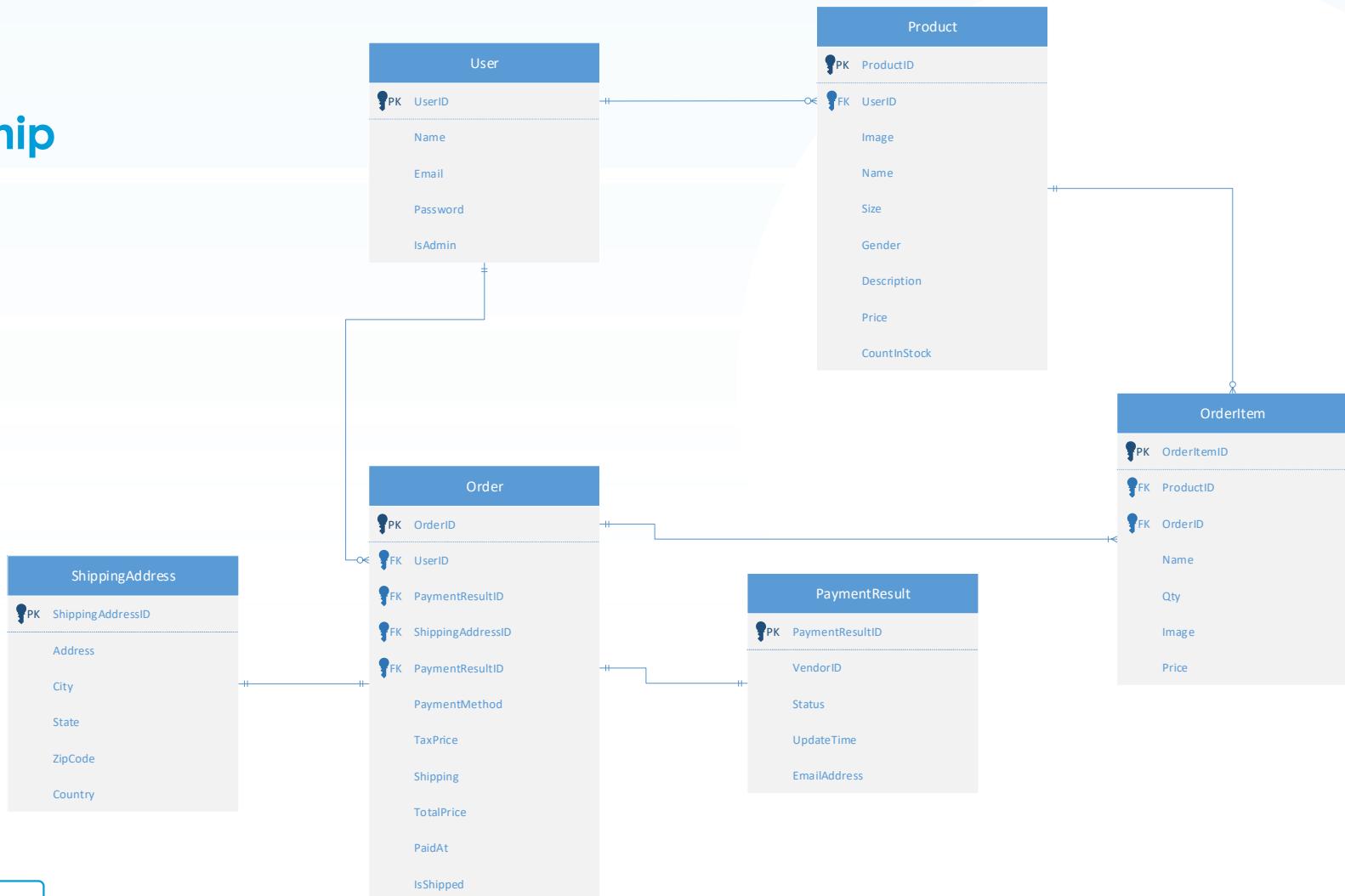
- Top two risks identified pertained to System Development
- Fallback plan/WBS made if planned server does not meet requirements
- Virtual private server (VPS) host would be used instead
- Would require 25-40 hours to complete
- Contingency budget of \$2,500 is allotted

System Development Fallback Plan

1. Secure a hosting platform
 - a. Pick a hosting platform
 - i. Gather a list of options
 - ii. Perform cost-benefit analysis
 - iii. Subscribe to the platform
2. Install OS
 - a. Pick operating system
 - i. Review requirements
 - ii. Assess software availability
 - b. Configure users
 - i. Determine which users are required
 - ii. Create required users
 - c. Configure automatic updates
 - i. Review documentation for the package manager
 - ii. Use built-in automation or syscron
3. Setup domain
 - a. Buy domain
 - i. Ensure that we need to buy a domain
 - ii. Gather a list of options
 - iii. Perform cost-benefit analysis

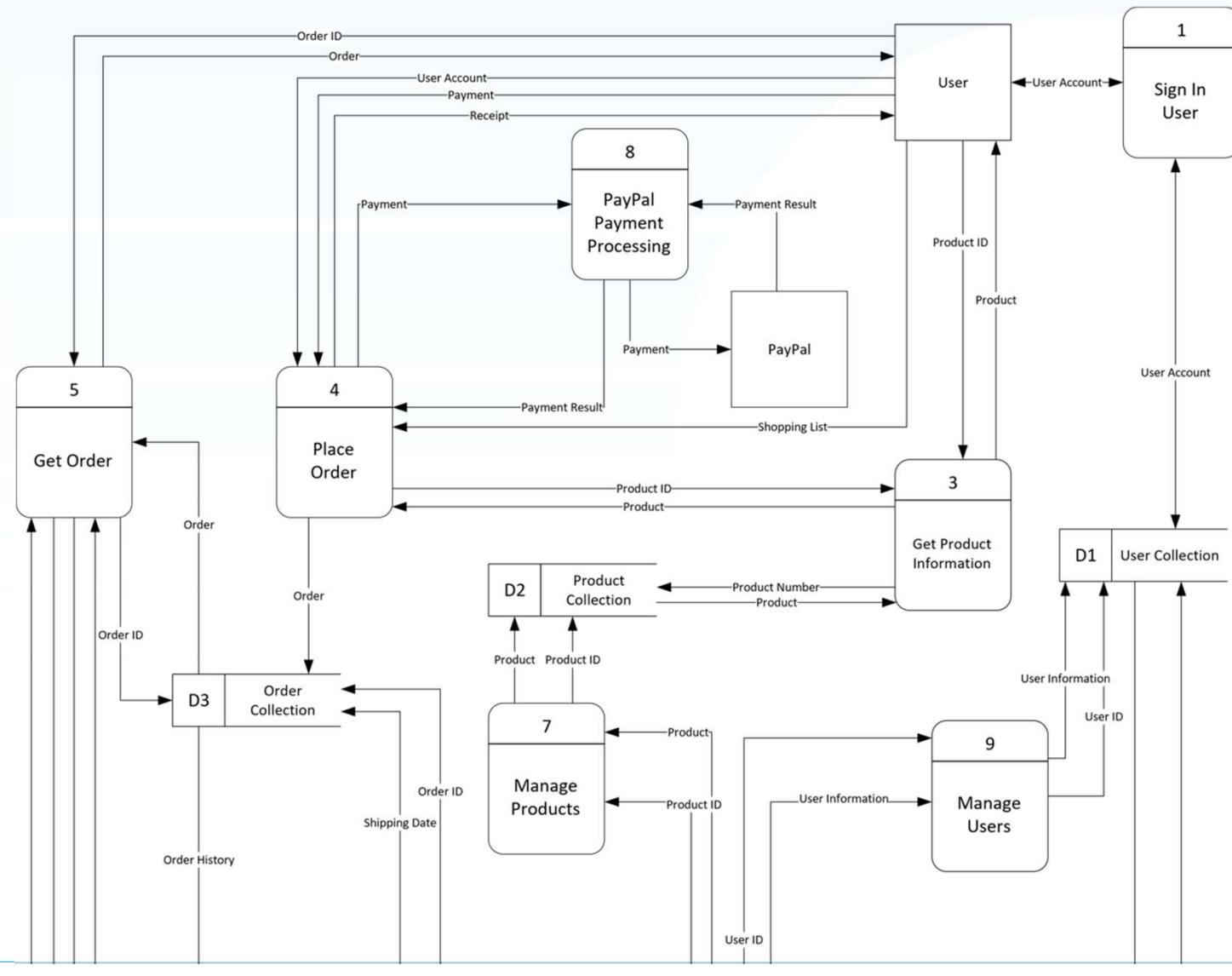
Figure 1. Sample of System Development Fallback Plan

Lumico Webstore Entity Relationship Diagram

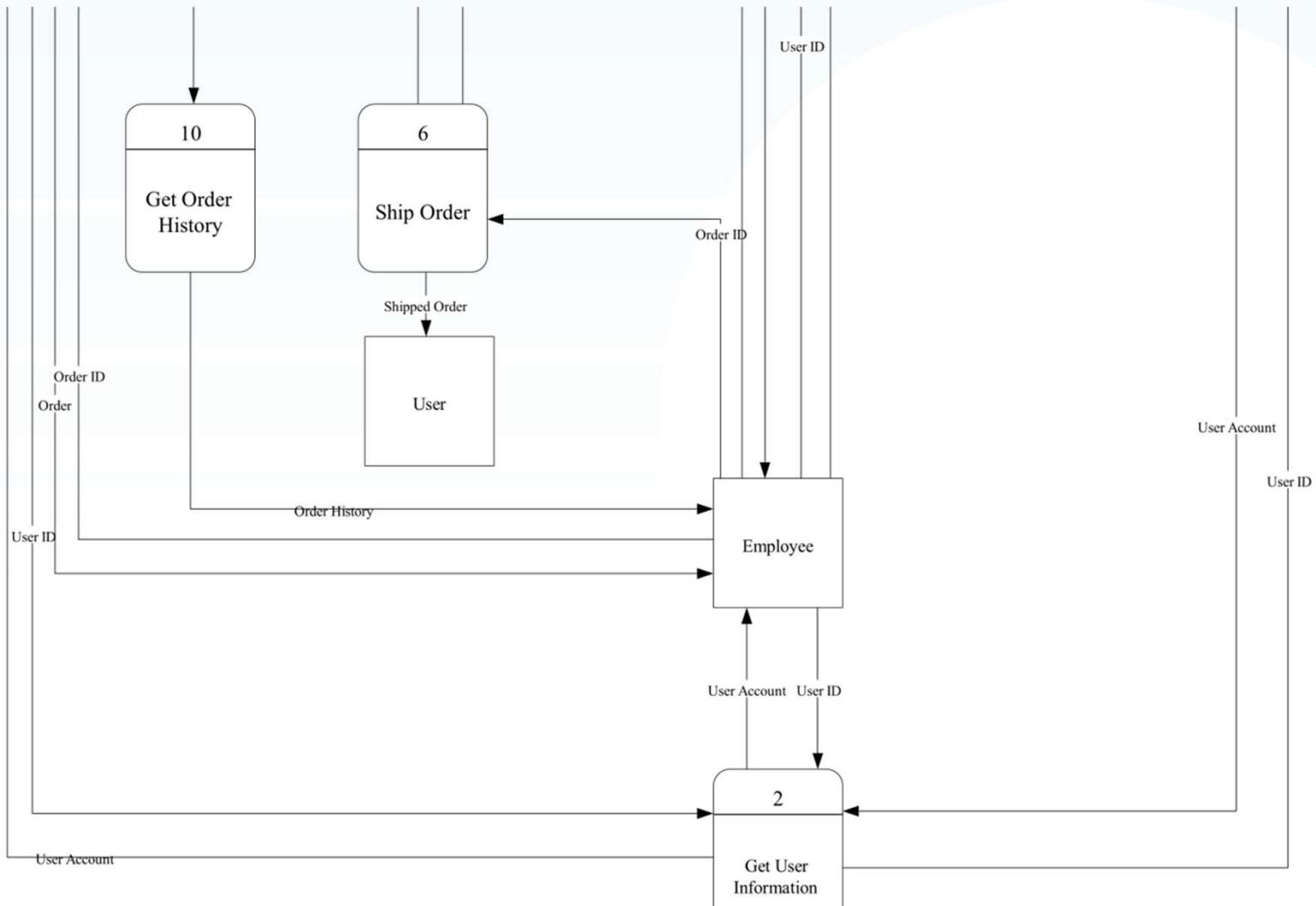


Lumico Webstore

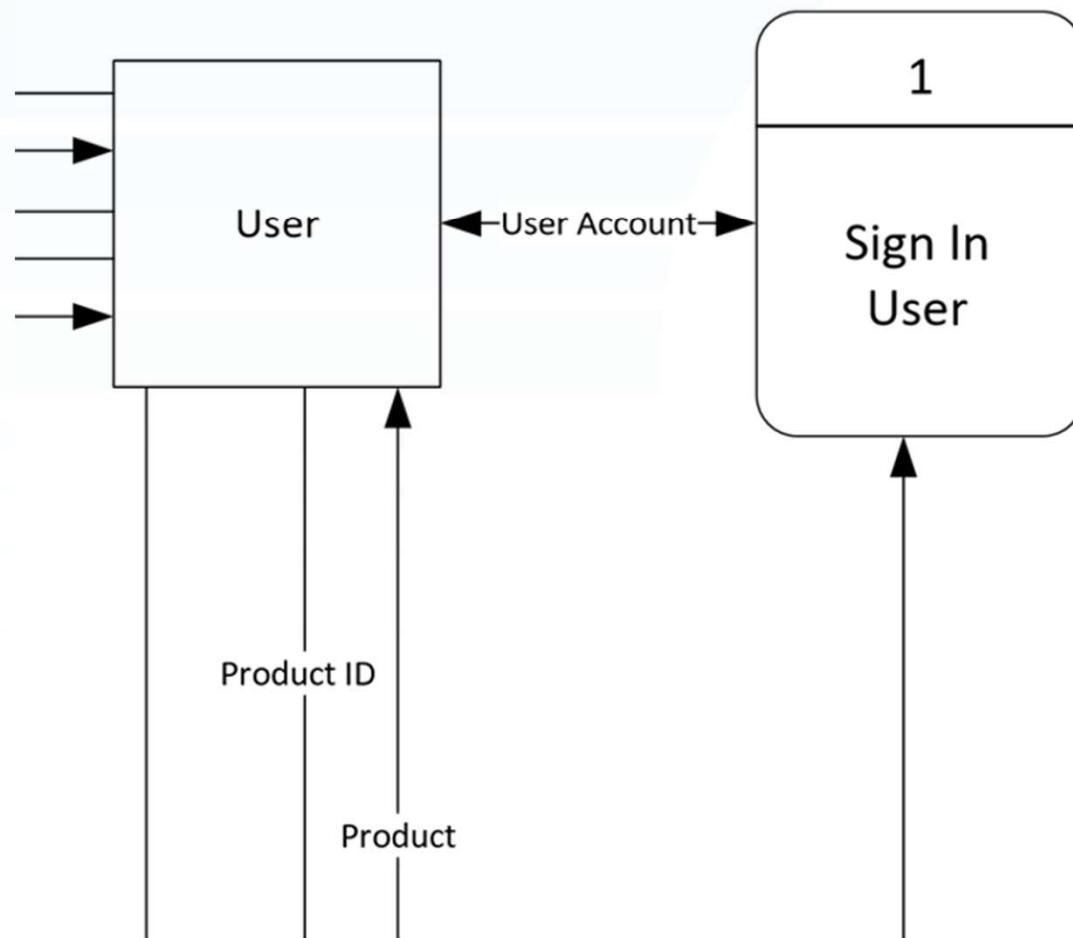
Level 0 DFD



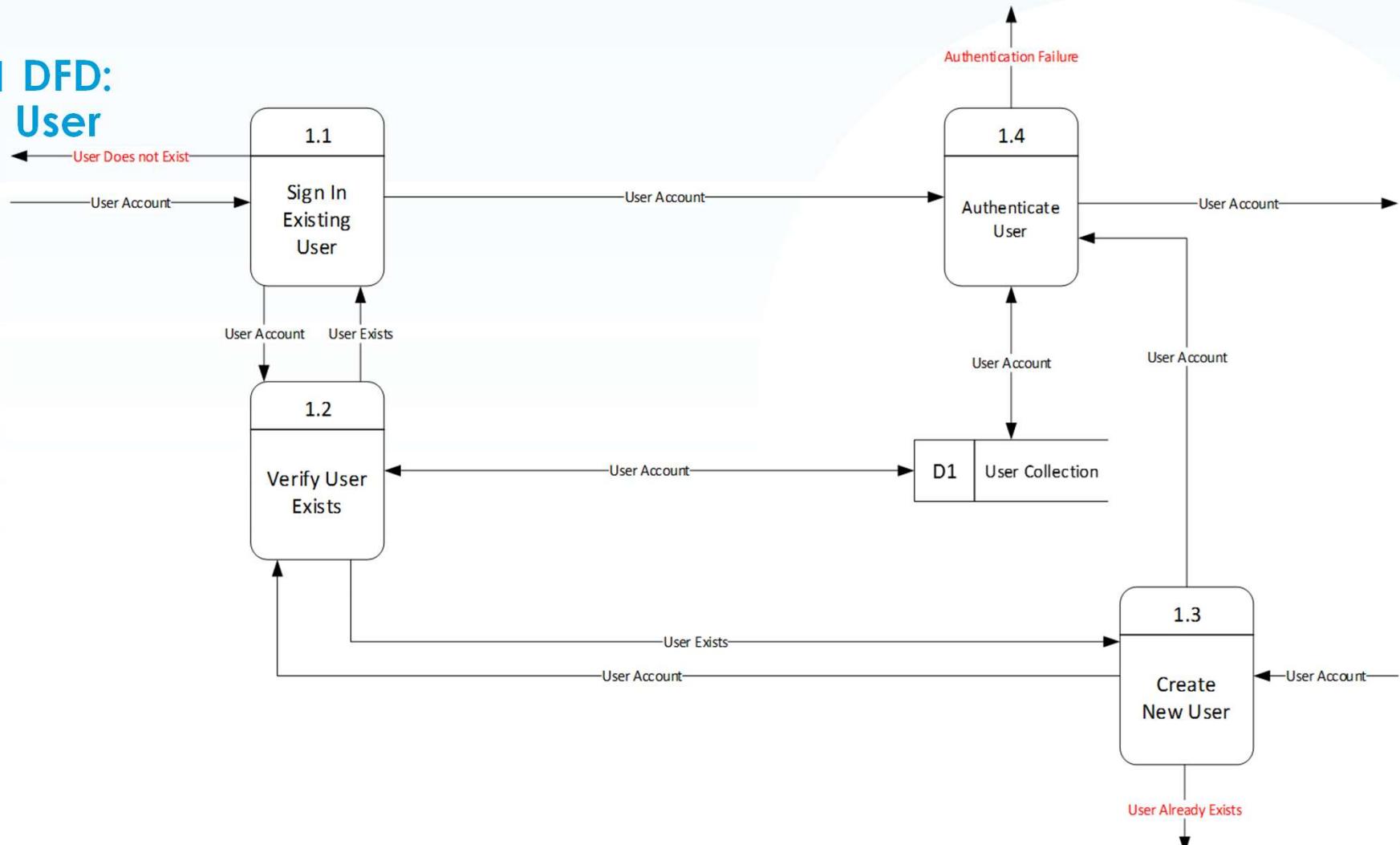
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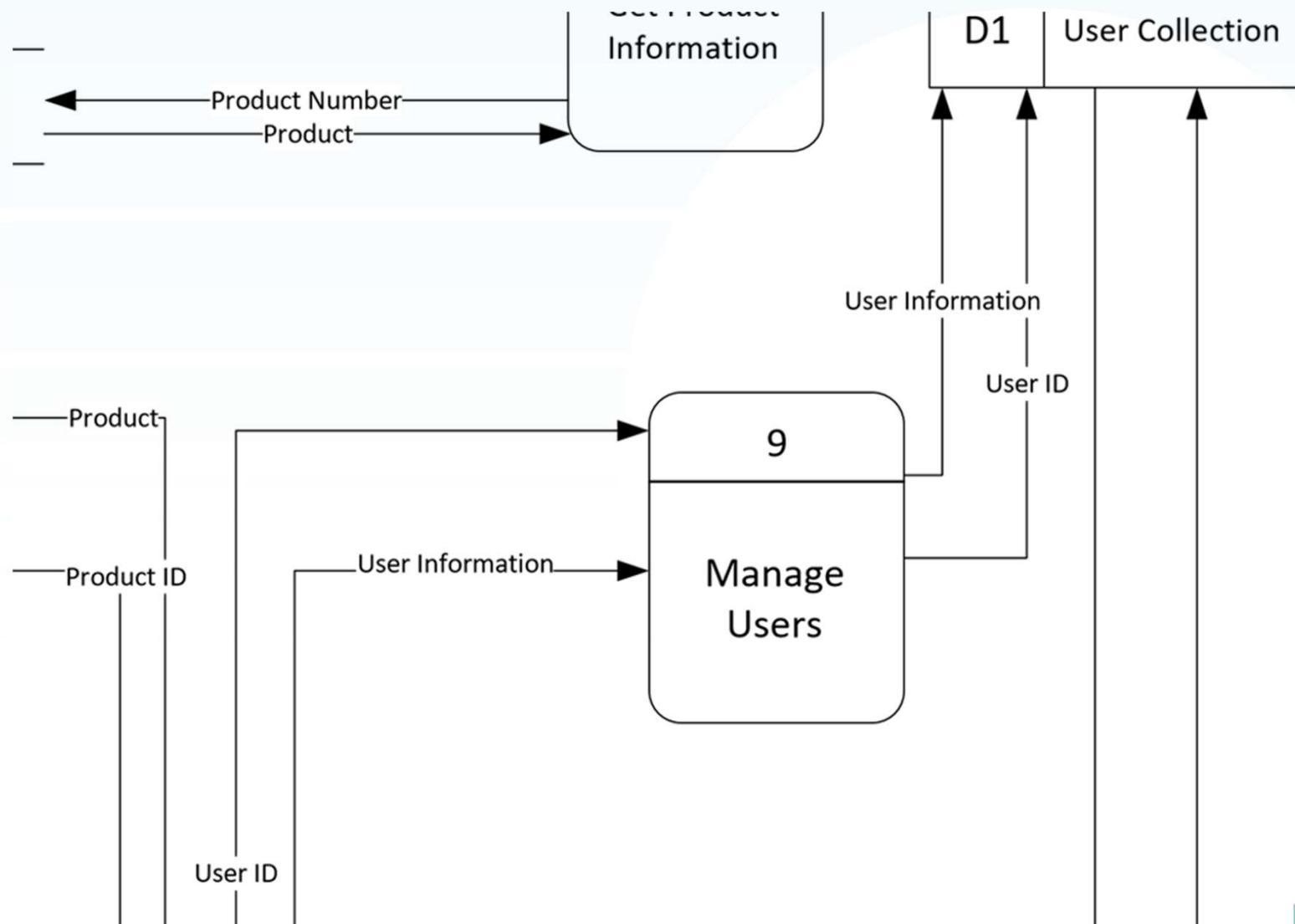
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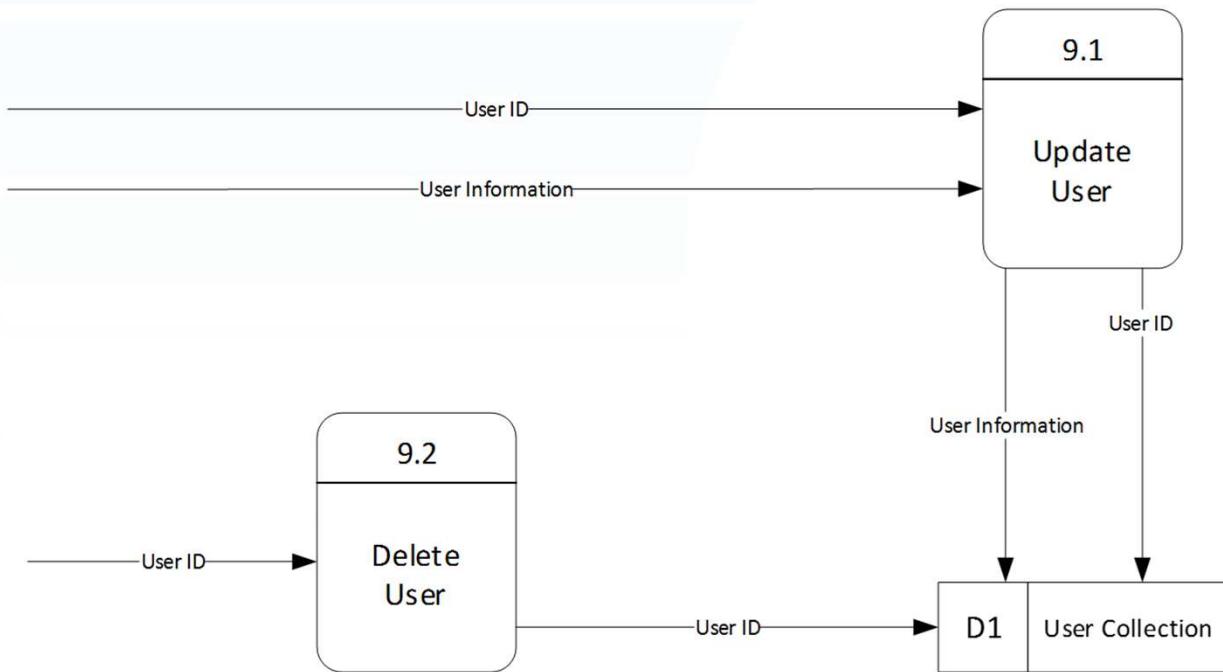
Level 1 DFD: Sign In User



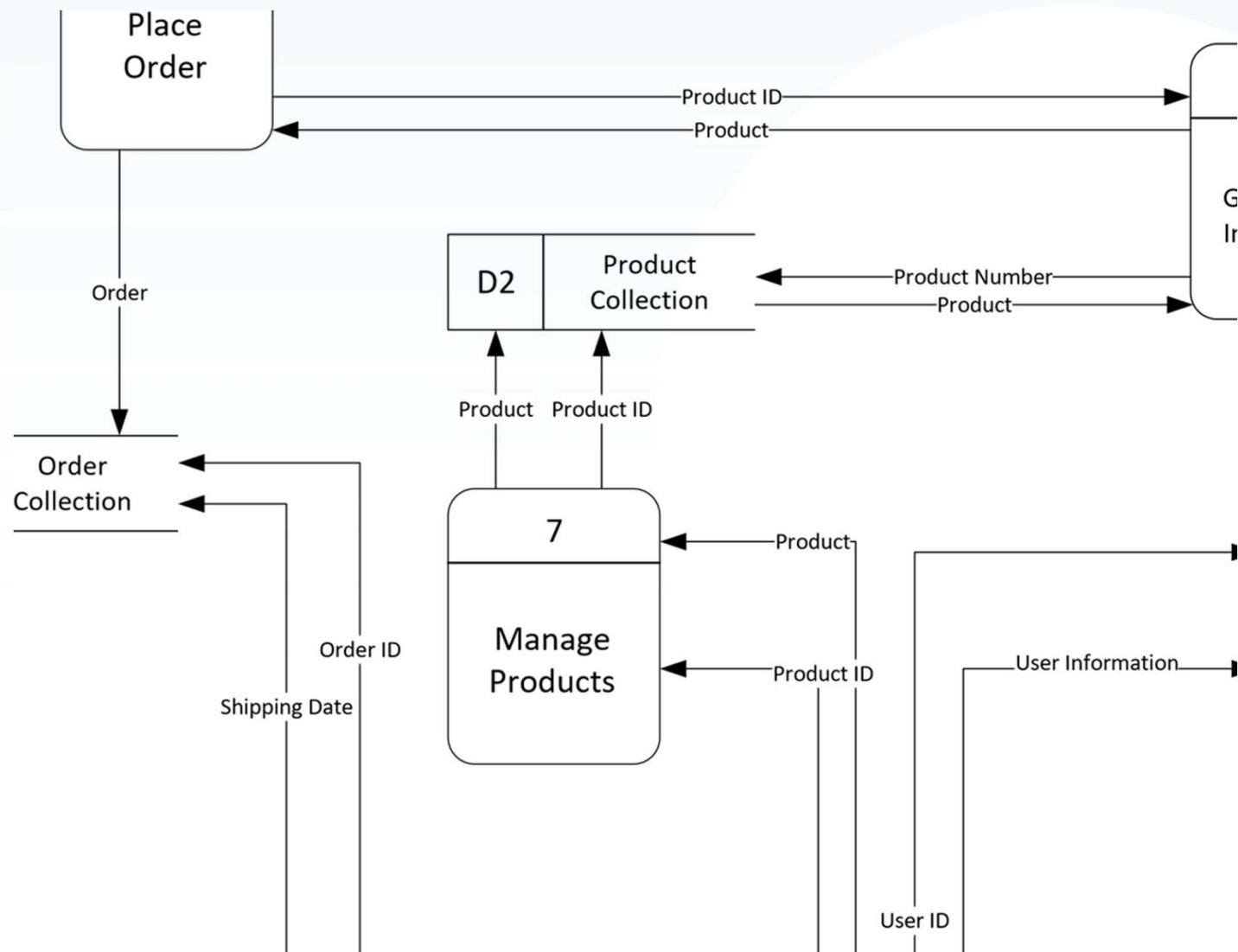
Lumico Webstore Level 0 DFD



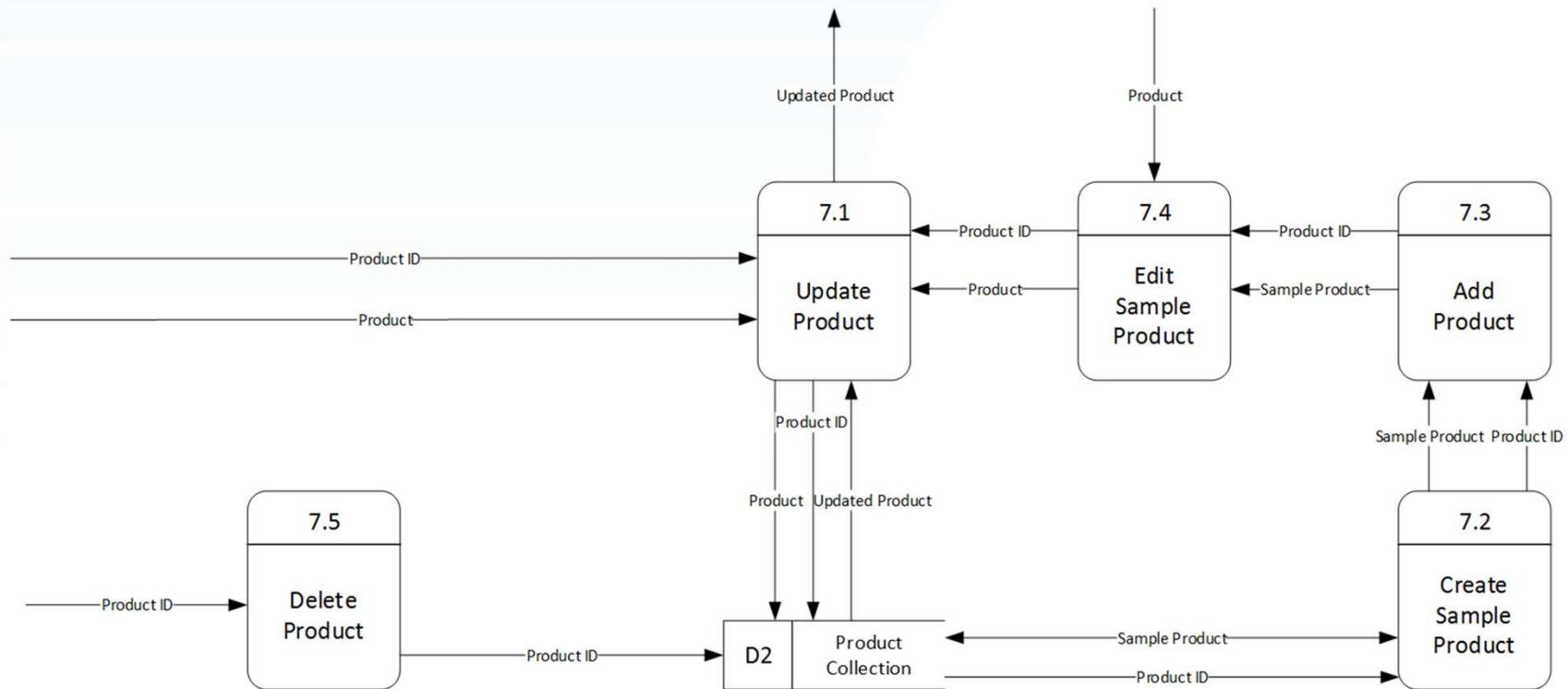
Level 1 DFD: Manage Users



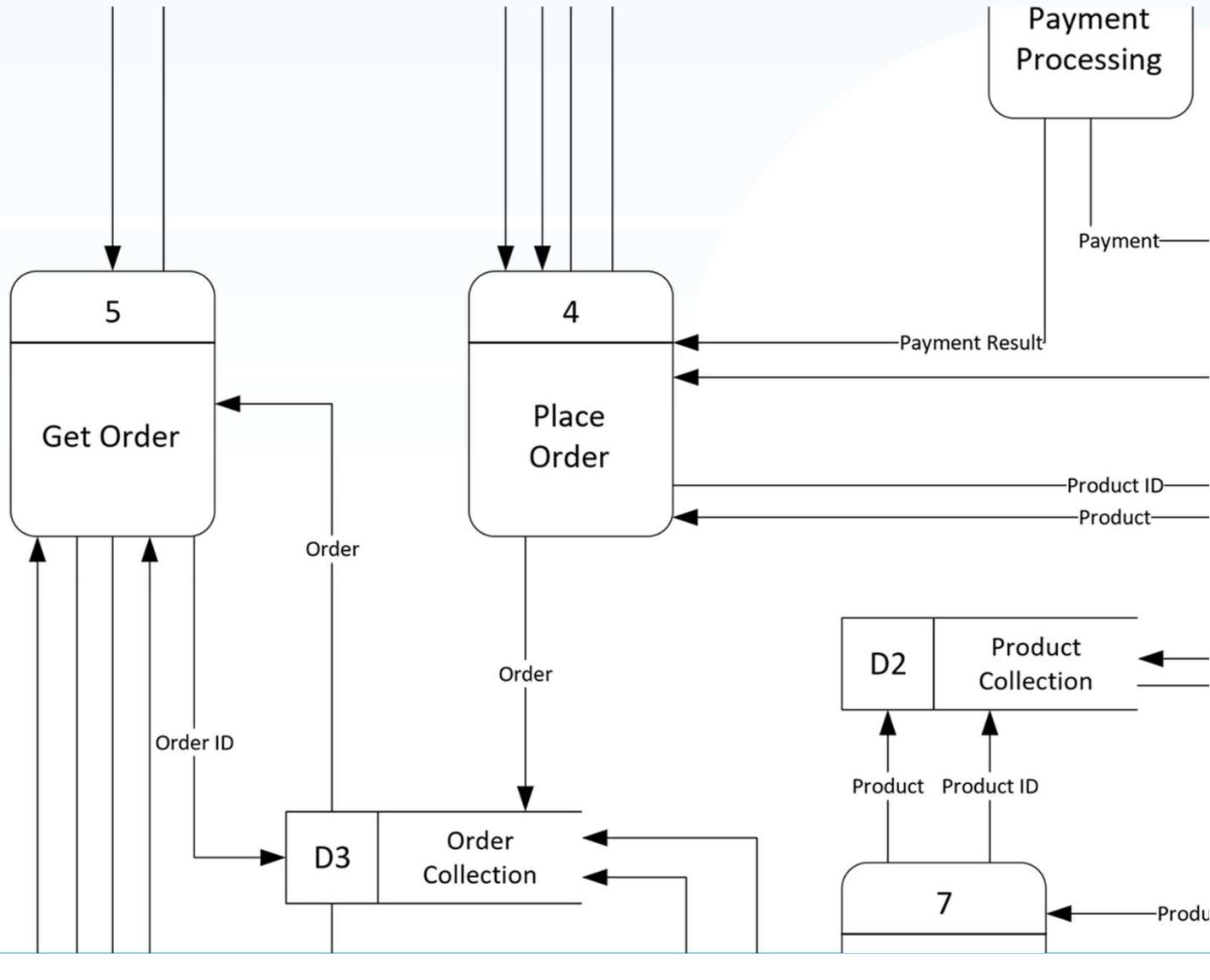
Lumico Webstore Level 0 DFD



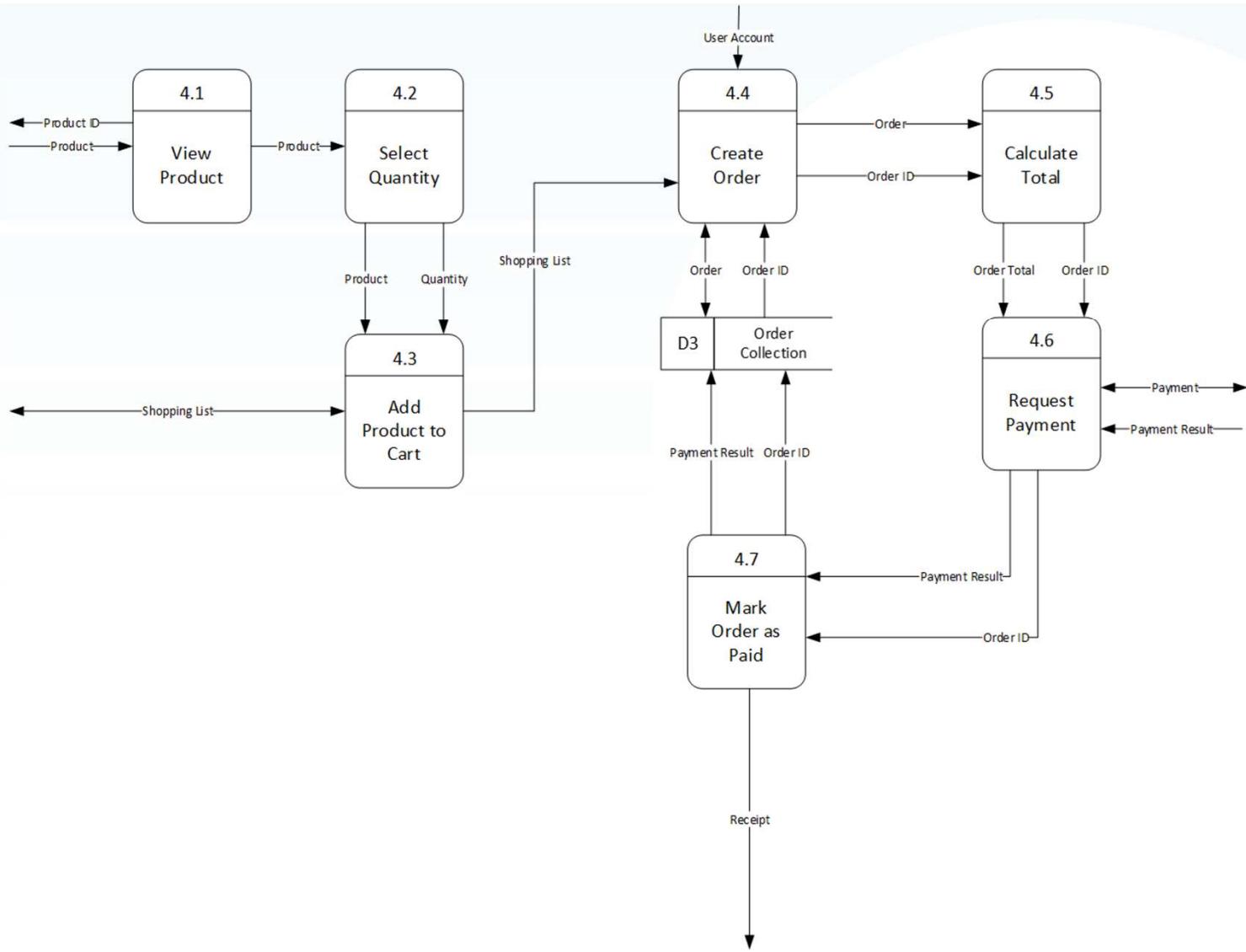
Level 1 DFD: Manage Products



Lumico Webstore Level 0 DFD



Level 1 DFD: Place Order



Project Closing

- Completed goal = working, responsive application
- Fast, attractive, and mobile-friendly
- React and Tachyons for web interface
- Lumico data transferred to MongoDB Atlas
- Both parties agreed project requirements were met
- Lumico is able to operate as a competitive online vendor now



Lessons Learned

Daniel Howard

- Time management

Nikheel Asodia

- Communication management

Viktorija Kasirovaite

- Scope management

Shreena Patel

- Communication/schedule management

Dhruv Patel

- Communication management

Musab Hamid

- Stakeholder management

Tyler Nullmeier

- Risk/quality management

