Module 5: Project Proposal

Hullabaloo Party Supplies Customer Order System

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Executive Summary

Hullabaloo Party Supplies (HPS), a party supply provider and distributor with thirteen nationwide locations, is shifting from a Selling to Vendors, a B2B business model, to a Selling directly to Consumers (B2C) business model. HPS management has stated that the existing B2B Information System (B2B-IS) does not support their new B2C business model as it lacks the proper customer interface and functionality. This proposal recommends implementing a new B2C-IS, more specifically a Customer Order System (COS) that is more suited for HPS's new business goals. The proposal is part of the Project Initiation and Planning (PIP) process for the development of a B2C-IS at HPS. In the early phase of the PIP, HPS management stated that the COS needs to allow customers to order multiple different items online in chosen quantities, provide complete customer information, create an account, see calculated order costs including tax, pay via credit card or PayPal, have ordered items debited from inventory, and choose from multiple shipping options. (Note: Once an order is complete, the process will transition to the B2B-IS shipping system.) This initial proposal outlines an overview of the purpose of the project, the problem statement, goals and objectives, key assumptions, project stakeholders, a high-level Work Breakdown Structure (WBS) for requirements gathering, and potential risks for the new COS project. It also provides a detailed list of requirements, a high-level Data Flow Diagram (DFD) of the system, a feasibility economic analysis, and proposes to utilize the Agile Scrum methodology to develop the system.

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Goals and Objectives

HPS is a party supply provider and distributor selling to third-party vendors with thirteen nationwide locations, and has recently decided to shift from a B2B business model to a B2C business model. This will allow consumers to order from HPS directly, and HPS will then ship directly to them, eliminating the need for third-party vendors. After reviewing the existing B2B-IS, management has identified that the system does not meet the requirements of the B2C business model. Therefore, a new system is needed in the form of a B2C-IS that specifically supports the B2C business model. Two systems have been identified as being part of the B2C-IS: the Customer Order System (COS) and the Party Supply Shipping System. This proposal only addresses the COS part of the B2C-IS. The purpose of this proposal is to initiate the planning and development of COS suited to meet the needs of HPS's new B2C goals. The proposal is part of the PIP phase, which is a critical activity in the development project (Valacich & George, 2020a). It addresses the initial assessment of the project's scope, feasibility, potential risks, and resource requirements necessary for planning the COS development. Furthermore, to plan and assess the feasibility of the COS is essential to define its expected functionality.

The COS needs to function as a core B2C-IS component, meeting the following requirements provided by HPS management:

- Gather customer information.
- Manage customer accounts.
- Handle orders (including orders composed of multiple items).
- Manage payment processing.
- Manage inventory levels based on orders.

- Present customer shipping choices (once an order is complete, the process will transition to the shipping system).

This functionality will enable HPS to directly sell party supplies to consumers via an e-commerce store system (the new COS), bypassing third-party vendors. Moreover, aligning COS development with HPS business objectives, particularly the shift from B2B-IS to B2C-IS, is a critical factor for accomplishing HPS's mission successfully (Valacich & George, 2020b).

Problem Statement

It is important to understand how the existing B2B-IS conflicts with its HPS' business plans. Understanding this conflict is essential for justifying the need for the proposed solution (Jaggi, 2023). To that purpose, this problem statement provides a clear description of the problem. HPS's existing B2B-IS is optimized for large-volume transactions with vendors and lacks the architecture, user interface, and functionalities required for a B2C e-commerce small-volume consumer transactions. In other words, the system is not optimized for personal customer accounts, processing consumer payment methods (PayPal), managing inventory based on B2C model needs, managing small orders typically associated with the B2C model, calculating sales tax for consumers, or providing a friendly User Interface (UI) and support for individual consumers, rendering the B2B-IS infeasible to meet the requirements associates with the new HPS business goals. Additionally, to meet these requirements, a new dedicated B2C-IS is needed, specifically, a new COS that is optimized for consumer online ordering operations. Without such a system, HPS will be unable to meet its new B2C business goals.

Key Assumptions

During the early PIP phase for the COS, the following key assumptions were made:

- "The project team members have the required skills and expertise to perform their assigned roles effectively" (Samartsheet, 2023).

- HPS management is committed to shifting from a B2B system to a B2C system and supports this project.
- "The project requirements and scope are well defined and will not significantly change during the project" (Samartsheet, 2023).
- Stakeholders (Marketing, IT, Finance, Warehouse) will support the project by being available for interviews, and they have a clear understanding of the project goals and objectives
- Funding and resources are planned to be allocated for the project.
- The existing inventory management system is accessible through an API or by other means.
- The shipping system of the new B2C-IS will integrate with the COS by receiving order data from the COS.

Project Stakeholders

The stakeholders for the HPS Customer Order System (COS) include:

- The HPS management department, they are the project sponsor, providing the funds, the COS requirements, and final approval.
- The sales and purchase department is responsible for setting item prices and defining promotional prices
- The marketing department defines customer experience requirements for the COS, the item presentation designs and running promotions.
- The IT department and the systems analyst are responsible for project management, analysis, design, development, implementation, and maintenance of the COS.

- The finance department is responsible for defining COS payment processing methods and tax calculation (equations).
- The warehouse (inventory Staff) defines how COS orders impact inventory, item availability, and how it should interface with the shipping system.
- Customers – the consumers are the end-users of the COS; their needs define the functionality requirements of the system.
- Legal and compliance teams are responsible for ensuring that the COS adheres to data privacy regulations and payment standards.

High-Level WBS for Requirements Gathering

WBS for an e-commerce project is a visual, hierarchical deconstruction of the project (Yakovlieva, 2024). It divides the project into manageable tasks (Valacich & George, 2020c). Requirements gathering ensures that the final version of COS meets stakeholder needs and avoids costly scope issues (Satpathy, 2024). Below is a six-step WBS for the COS requirements gathering:

1. Project Initiation & Planning Refinement
   - Confirm primary, secondary, and tertiary stakeholders identified in the early PIP phase. One or more analysts are assigned to work with the stakeholders (Valacich & George, 2020a)
   - Define engagement strategy for the analysis phase. This includes workshops and promoting communication between analysts and stakeholders.
   - Schedule initial analysis phase kick-off/review meetings by developing a preliminary schedule.

2. Requirements Elicitation
    - Stakeholder interviews need to be performed. This is done to understand the needs and expectations of the stakeholders, as well as to collect opinions and facts.
    - Facilitate requirements workshops (brainstorming, groups for UI). By conducting Joint Application Design (JAD) sessions with users, managers, and analysts to collect requirements and resolve potential conflicts (Valacich & George, 2020d).
    - Perform document analysis (review B2C-IS documentation like business forms, reports, and manuals).
    - Analyze system interfaces such as UI and payment gateways by observing and creating prototypes.
3. Requirements Documentation
    - Define documentation format utilizing user cases and stories.
    - Document functional requirements (ordering, shopping cart, account mgmt., payment), defining what the system needs to do.
    - Document non-functional requirements, describing how the system needs to function.
    - Document data requirements; for example, size and how the data needs to be handled.
    - Document interface requirements, how COS needs to interact with other systems.
4. Analysis of Requirements and Prioritization
    - Analyze documented requirements.
    - Model requirements by using Data Flow Diagrams (DFD).
    - Prioritize requirements based on value or urgency.

5. Validate Requirements
    - Make sure that the gathered requirements meet the needs of the stakeholders and are testable.
    - Perform review meetings/walk-throughs of the requirements (Valacich & George, 2020a).
    - Obtain stakeholder agreement/sign-off on baseline requirements.
6. Requirements Management Planning
    - Define a requirement change/modification control process to use during the development process.
    - Establish a requirements traceability (linking requirements to design, code, tests).
    - Configure requirements management tool/repository (e.g., GitHub)

COS Risks

Identifying risk is an essential activity of the PIP (Valacich & George, 2020a). The following is a list of risks for the COS project and their descriptions:

Economic Risks:

- Cost overruns in COS development and integration. In other words, the development and integration processes could overrun the budget due to unforeseen and/or unplanned expenses.
- Benefit shortfall as B2C sales volume may prove lower than projected, the benefits from COS may not be met.
- Total Cost of Ownership (TCO) was not calculated properly or failed to account for all the system’s operational and maintenance expenses.

Technical Risks:

- Difficulty integrating the COS with the future shipping system or inventory system.
- COS performance degrades as customer volume grows, failure to plan growth accurately.
- Failure to implement adequate, secure customer personnel data.

Operational Risks:

- Consumers find the COS difficult to use, such as difficulty navigating or understanding the system.
- HPS staff experience significant difficulty adapting to the new B2C-IS COS. Inadequate training or not enough training.
- Issues maintaining inventory data may arise between the COS and warehouse systems.
- Issues with system downtime during the initial launch of the system.

Legal Risks:

- Failure of the COS to meet legal requirements for securing customer private information.
- Payment security is non-compliance with Payment Card Industry Data Security Standard.

Schedule Risks:

- Unrealistic timelines due to failure to identify potential delays in development, testing, or implementation phases.
- Scope creep, too many changes to the project scope, can hurt the timely completion of the different development phases
- Developers, analysts, and stakeholders may not be available when needed, delaying he project schedule

Political Risks:

- Stakeholders do not buy into or have different goals and/or priorities with the implementation of the COS.
- Management priorities change mid-project, impacting the COS development.

Solution

In this section, we provide a detailed requirements list, the Data Flow Diagram (DFD) of the system, the feasibility analysis including the Net Present Value (NPV) and the return on investment calculations, as well as the breakeven point calculation with a line chart to support your breakeven results, and a the selected development methodology.

Detailed Requirements List

The following requirement list is composed of the requirements provided by HPS management and the requirements gathered by high-level WBS (Work Breakdown Structure) process.

1- Functional Requirements

Functional requirements define what the system needs to do. Functional requirements are often categorized into components representing various processes of the system. For this project, the processes are defined as Customer Account Management, Product Catalog & Browse, Order Placement & Shopping Cart, Checkout Process, Inventory Management Interface, Order Fulfillment Interface, and Administrative Functions.

- Customer Account Management:
    - Allow new customers to create an account online.
    - Allow existing customers to log in to their accounts.
    - Allow customers to view and edit their profile information.

  - Allow customers to view their order history.
  - Provide password recovery methods.
- Product Catalog & Browse:
  - Display product categories and individual products with descriptions, images, and prices.
  - Allow customers to search for products.
  - Allow customers to filter and sort products.
  - Display product information.
- Order Placement & Shopping Cart:
  - Allow customers to add multiple items to an online shopping cart..
  - Allow customers to view and modify items (quantity) in their shopping cart.
  - Calculate and display the total amount for items in the cart.
- Checkout Process:
  - Allow customers to provide or select complete customer information for the order.
  - Calculate order costs based on sales tax, shipping cost, and discounts.
  - Display a final order summary before payment.
  - Allow customers to choose from multiple shipping options.
  - Process payments via credit card and PayPal.
  - Generate an order confirmation number and display order confirmation information.
  - Send an order confirmation email to the customer.
  - Places a hold (sold tag) on ordered items from the inventory system after the order is paid for.
- Order Fulfillment:

    - Once the order is paid, the order information (customer information, items ordered, shipping information) is sent to the B2C-IS shipping system.

2- Reporting Requirements

These requirements were defined during the documentation requirements gathering process.

- For customers, an order history option needs to be available for viewing, allowing them to view each order individually.
- For HPS staff, sales, customers, and order status reports can be requested and/or viewed.

3- Stakeholder Requirements

Stakeholder requirements are the needs, expectations, and constraints of the different stakeholders gathered during the requirements elicitation process.

- Customers
    - User-friendly, intuitive system.
    - Can be accessed by web browsers.
    - Detailed information about product (pricing), shipping, and order status.
    - Secure transactions and personal information protection.
    - Available to create an account and easy checkout.
- HPS Management
    - Supports B2C model and goals.
    - Can provide data for decision-making.
    - Increased sales and high customer satisfaction.
    - Stays within budget.
- Sales and Purchase Department

    - Pricing and promotions are reflected correctly.
- IT Department & Systems Analyst
    - Maintainable, scalable, and secure system.
    - Easy integration with existing systems.
    - Matches documentation.
- Finance Department
    - Correct tax and total calculations.
    - Secure payment processing.
- Warehouse (Inventory Staff)
    - Interface with the shipping system to process order shipping.
- Legal and Compliance Department
    - Strong data privacy regulations.
    - PCI-DSS compliance.

4- Non-Functional Requirements

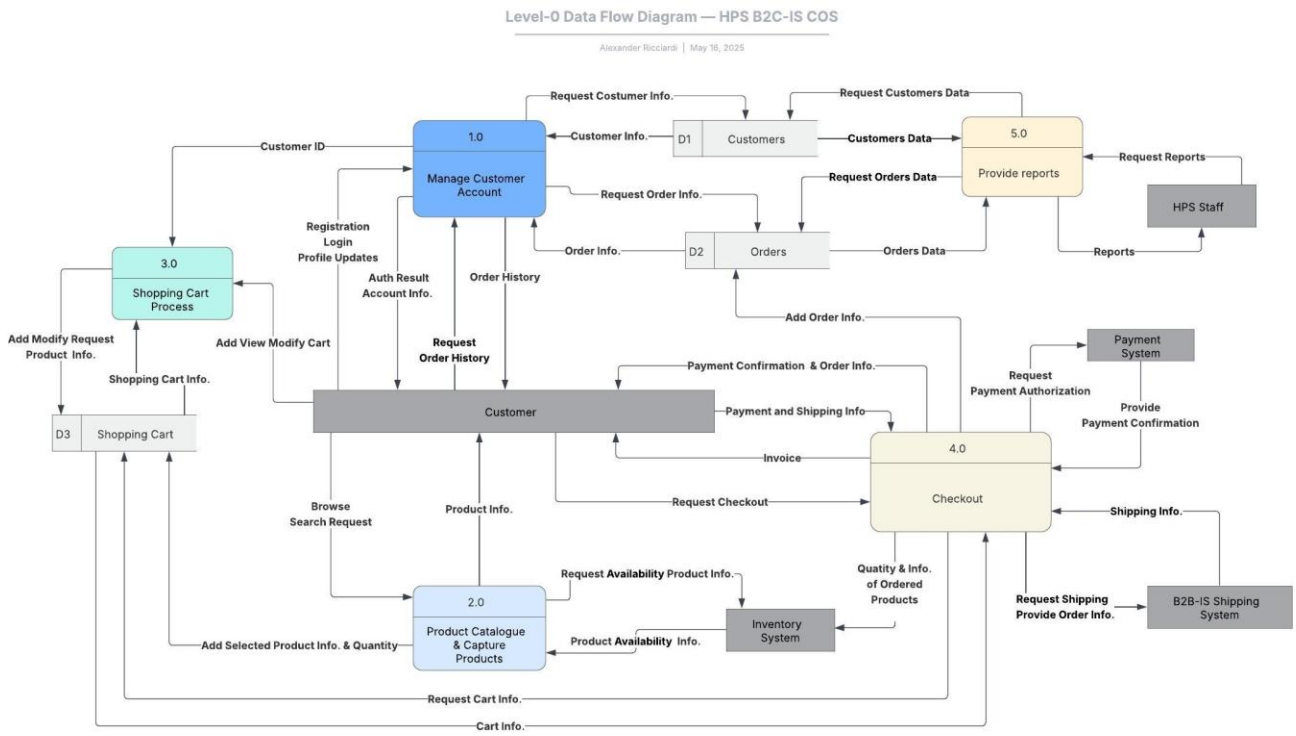
- Performance - fast page loads page loading (3-5 seconds), can handle concurrent user interactions.
- Security – encrypted customer data, processes to protect against web vulnerabilities, and authentication processes need to be implemented.
- Usability – simple navigation and easy to use..
- Reliability/Availability - high uptime (e.g., 99.9%), data backup and recovery.
- Scalability - capable of handling future growth in customers, products, and transactions.
- Maintainability - documented code, easy updates, and maintenance schedule.
- Integrations: Can interface with inventory, finance system, and payment gateways.

Data Flow Diagram

In this section, we provide a high-level Data Flow Diagram (DFD) that was decomposed from the COS context diagram, see Appendix Figure A.1. The high-level DFD illustrates the primary individual processes of the system and their related data flow at the highest level, level-0.

Figure 1

B2C-IS COS DFD



Note: The B2C-IS COS DFD illustrates the primary individual processes of the COS system and their related data flow at the highest level, level-0.

The following table describes the processes illustrated in the high-level DFD. For the data flow, refer to the DFD itself, as they are illustrated by arrows, and for the external entities, refer to the Appendix Table A.1.

Table 1

COS DFD Processes

Process	Description
1.0 Manage Customer Account	This process's role is to manage customers' account information and order history, and order status. It is also responsible for creating, authenticating, and maintaining customer accounts and profiles.
2.0 Product Catalogue & Capture Products	This process's role is to allow customers to "browse / add-to-cart" products by displaying the product's information, such as prices, images, and availability.
3.0 Shopping Cart Process	This process's role is to manage all CRUD operations on the customer's cart. It also displays the shopping cart's contents.
4.0 Checkout	This process's role is to manage checkout by converting the shopping cart's contents into an order after payment is confirmed and the shipping method is selected. It exchanges order information with the Payment System and B2C-IS Shipping System, as well as provides order information to the Inventory System.
5.0 Provide Reports	This process's role is to create and provide customer and order data reports to the HPS staff.

Note: The table describes the different high-level B2C-IS COS processes.

Data Stores

- D1 Customer stores customer account data such as credentials, addresses, and profile.
- D2 Orders stores order data such as products, delivery status, and shipping details.
- D3 Shopping Cart, it is a transient store holding each customer's cart information and state until checkout is performed or a timeout on the store products is reached; purged after order completion.

Feasibility Analysis

We conducted a feasibility analysis to evaluate B2C COS's economic viability. It was performed based on the following provided information:

- Monetary benefits of customer ordering: $185,000 per year
- One-time development costs: $275,000.
- Recurring operational costs: $85,000 per year.
- Discount rate: 12 percent.
- Project lifecycle/time horizon: 5 years.

The calculations were performed based on the cost-benefit analysis techniques: Net Present Value (NPV), Return on Investment (ROI), and Break-Even Analysis (BEA). See Appendix Table A.2 for the technique's descriptions and the Appendix Feasibility Analysis section for more information about the calculations.

Table 2

Feasibility Analysis Spreadsheet

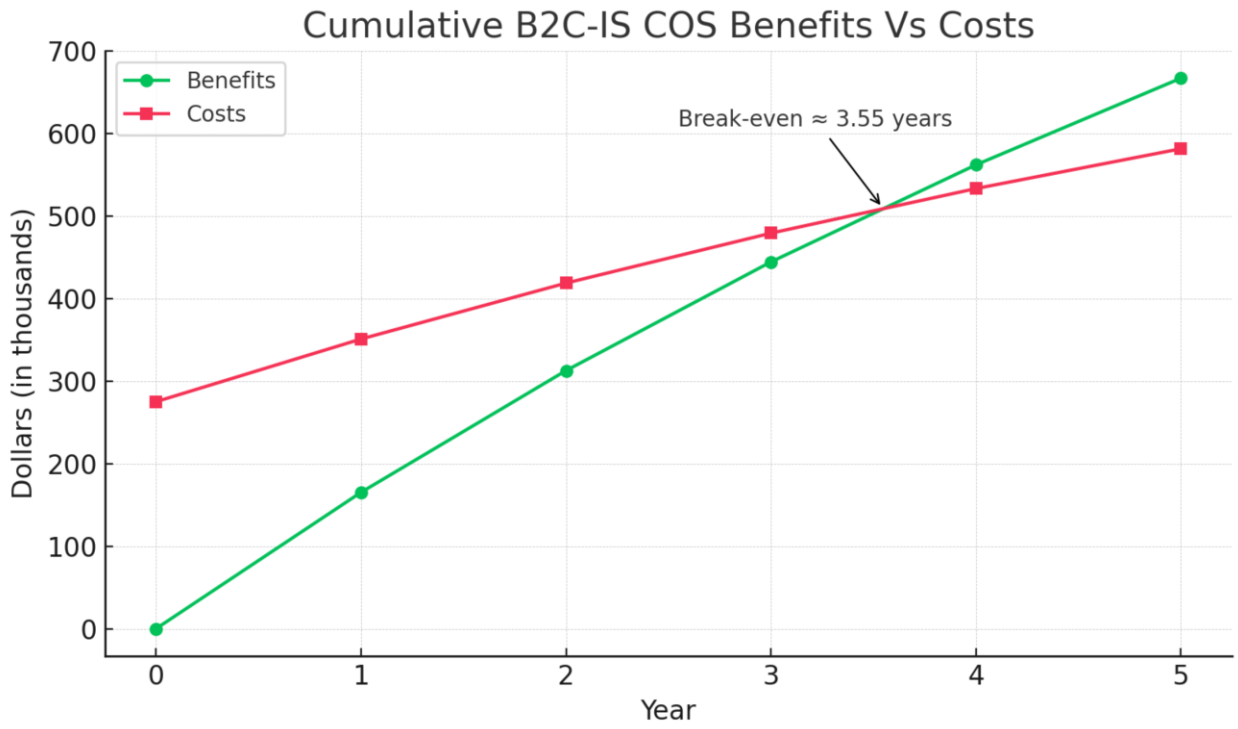
Feasibility Analysis HSP B2C-IS COS						
Cost of Capital		12%				
Initial Capital Expense		$275,000				
Years		1	2	3	4	5
Cash Inflows (Sales)		$185,000	$185,000	$185,000	$185,000	$185,000
Present Value (PV) of Cash Inflows		$165,179	$147,481	$131,679	$117,571	$104,974
Cumulative Cash Flow Inflows		**$165,179**	**$312,659**	**$444,339**	**$561,910**	**$666,884**
Initial Investment	$275,000					
Cash Outflows (Expenses)		$85,000	$85,000	$85,000	$85,000	$85,000
Present Value (PV) of Cash Outflows	$275,000	$75,893	$67,761	$60,501	$54,019	$48,231
Cumulative PV Cash Outflows (Cumulative Cost)	**$275,000**	**$350,893**	**$418,654**	**$479,156**	**$533,175**	**$581,406**
NPV (Net Present Value)		($185,714)	($105,995)	($34,817)	$28,735	$85,478
ROI		-52.93%	-25.32%	-7.27%	5.39%	14.70%
Breakeven Analysis						
Yearly NPV Cash Flow	($275,000)	$89,286	$79,719	$71,178	$63,552	$56,743
Overall NPV Cash Flow	($275,000)	($185,714)	($105,995)	($34,817)	$28,735	$85,478

Note: The table illustrates an Excel spreadsheet illustrating the economic feasibility calculations for the five-year project horizon.

As shown in Table 1, Cumulative NPV turns positive part-way through Year 4 and breaks even ≈ 3.55 years, as the interpolating (|-34 817| / (63 552) = 0.55) gives the break-even point at about 3.55 years, see the Cumulative B2C-IS COS Discounted Benefits Vs Costs chart, Figure 2. The chart is based on the NPV (Benefits) and the Cumulative PV Cash Outflows (Costs) results from Table 2.

Figure 2

Cumulative B2C-IS COS Discounted Benefits Vs Costs



Note: The figure illustrates the benefits vs costs of the COS over five years based on the feasibility analysis calculation results.

As shown in Figure 2, the two curves intersect at ≈ 3.55 years, confirming the break-even point calculated from Table 2. Other notable results from Table 2 are:

- Total PV Benefits: $666,884
- Total PV Costs: $581,406
- Overall NPV: $ 85,478 (positive ⇒ economically attractive)
- Overall ROI: NPV ÷ PV Costs = 14.7 %

Together, these calculations results show that the project has excellent economic feasibility, as the project not only pays for itself within 3 ½ years but also shows a significant benefits margin thereafter.

Development Methodology

To develop the B2C-IS COS is crucial to choose the best-suited development methodology. When considering the overall project as a new B2C e-commerce system, and the COS being just one module of that system, we propose utilizing the Agile Scrum approach to develop the system. The Agile methodology is "a project management framework that breaks projects down into several dynamic phases, commonly known as sprints" (2025, February 20, p.1). Scrum is a style of Agile methodology that is suitable for small teams where scrum teams meet daily to discuss active tasks. The Agile Scrum approach is the best suited for the business size of HPS, its iterative nature allows flexibility, uncertainty, and modularity that are essential characteristics for developing a new system and integrating it into a large system, such as the HPS B2C e-commerce system. For those reasons, we propose utilizing Agile Scrum methodology to develop the new B2C-IS COS at HPS.

Recommendations/Conclusions

This section will be elaborated on the final project proposal paper.

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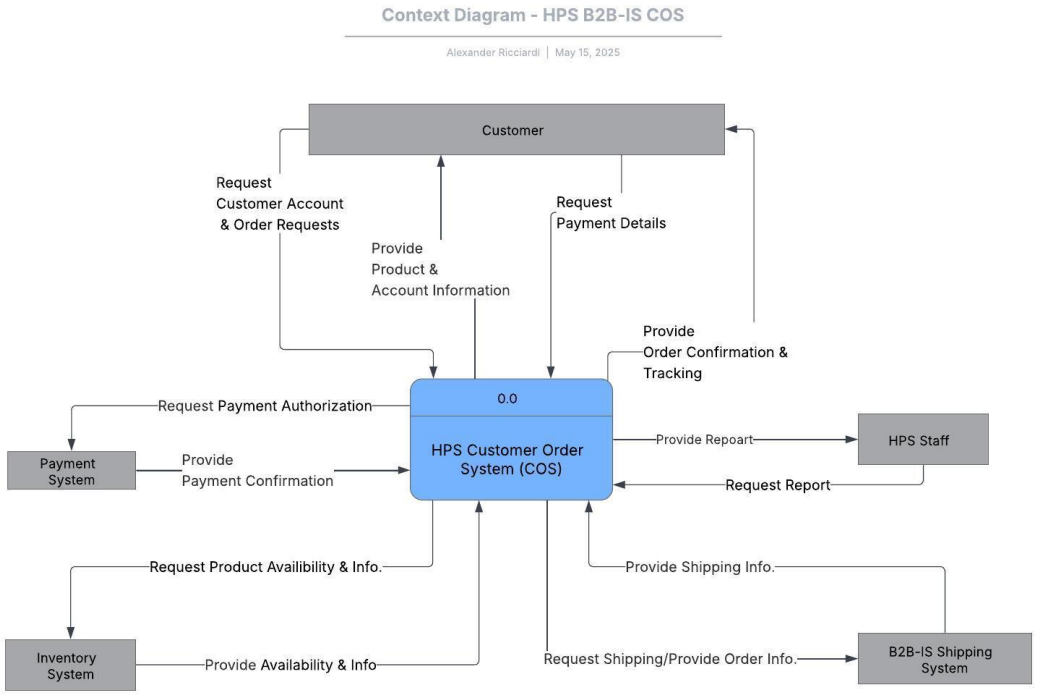
Appendix

Miscellaneous Figures and Tables

Figure A.1

COS Context Diagram



Note: The context diagram illustrates the highest view of the HPS B2C-IS COS data flow.

Table A.1

COS DFD External Entities

External Entity	Role in the System
Customer	It is an actor/external stakeholder; it is the end-user.
Payment System	This system is a third-party payment-gateway service that authorizes credit-card and PayPal payments.
Inventory System	This system is an internal HPS IS responsible for managing the product inventory.
B2C-IS Shipping System	This system is an internal HPS IS internal system responsible for product shipping.
HPS Staff	It is an actor; it is an internal stakeholder (sales, support, finance).

Note: The table describes external B2C-IS COS entities that interact with the system.

Feasibility Analysis

Table A.2

Cost-Benefit Analysis Techniques

Analysis Technique	Description
Net Present Value (NPV)	NPV uses a discount rate determined from the company's cost of capital to establish the present value of a project. The discount rate is used to determine the present value of both cash receipts and outlays.
Return on Investment (ROI)	ROI is the ratio of the net cash receipts of the project divided by the cash outlays of the project. Trade-off analysis can be made among projects competing for investment by comparing their representative ROI ratios.
Break-Even Analysis (BEA)	BEA finds the amount of time required for the cumulative cash flow from a project to equal its initial and ongoing investment.

Note: The table describes commonly used cost-benefit analysis techniques. Figure 5.7, from "Chapter 5: Initiating and Planning Systems Development Projects. Modern systems analysis and design (9th ed.)" by Valacich and George (2020a, p.121)

Table A.3

Calculation Formulas

Worksheet Row / Concept	Formula	Description
Present Value (PV) of a single cash flow	$PV_n = \frac{Y_n}{(1+r)^n}$	Y_n = cash amount in year n r = discount rate
Cumulative PV of Inflows	$CumPV_n = CumPV_{n-1} + PV_n$	Total Inflows Cash
Year-0 PV Initial Investment	$PV_0 = I_n$	I_0 = initial cash outflow
PVof Recurring Expense	$PVCost_n = \frac{C_n}{(1+r)^n}$	C_n = expense in year n
Cumulative PV of Costs	$CumCost_n = CumCost_n + PVCost_n$	Total Cost
Net Present Value (NPV)	$NPV = \sum_{n=0}^{N}(PV_n - PVCost_n) => NPV = CumPV_N - CumPVCost_N$	Total benefit minus total cost
Return on Investment (ROI)	$ROI = \frac{NPV}{CumPVCost_N}$	Ratio of net value to total cost

Yearly NPV Cash Flow	$\Delta NPV_n = PV_N - PVCost_N$	Net cash in year *n*
Overall (Cumulative) NPV Cash Flow	$CumNPV_n = CumPV_n + \Delta NPV_{n-1}$	Break-even year is where CumNPVn first ≥ 0

Note: The table provides a list of the various formulas used to conduct the feasibility economic analysis.

For the following table, refer to the Excel spreadsheet file, *Feasibility Analysis HPS.xlsx*.

Table A.4

Feasibility Analysis Excel Formulas

Cell	Formula	Description
C6	`=C5/(1+$C$2^C$4`	PV of Year 1 inflow
D6	`=D5/(1+$C$2^D$4`	PV of Year 2 inflow
E6	`=E5/(1+$C$2^E$4`	PV of Year 3 inflow
F6	`=F5/(1+$C$2^F$4`	PV of Year 4 inflow
G6	`=G5/(1+$C$2^G$4`	PV of Year 5 inflow
C7	`=C6`	Cumulative PV inflows Yr 1
D7	`=C6+D7`	Cumulative PV inflows Yr 2
E7	`=D7+E6`	Cumulative PV inflows Yr 3
F7	`=E7+F6`	Cumulative PV inflows Yr 4
G7	`=F7+G6`	Cumulative PV inflows Yr 5
B10	`=B8`	PV cost in Year 0
C10	`=C9/(1+$C$2^C$4`	PV of Year 1 expense
D10	`=D9/(1+$C$2^D$4`	PV of Year 2 expense
E10	`=E9/(1+$C$2^E$4`	PV of Year 3 expense
F10	`=F9/(1+$C$2^F$4`	PV of Year 4 expense
G10	`=G9/(1+$C$2^G$4`	PV of Year 5 expense
B11	`=B10`	Cumulative PV costs Yr 0
C11	`=B11+C10`	Cumulative PV costs Yr 1
D11	`=C11+D10`	Cumulative PV costs Yr 2
E11	`=D11+E10`	Cumulative PV costs Yr 3
F11	`=E11+F10`	Cumulative PV costs Yr 4
G11	`=F11+G10`	Cumulative PV costs Yr 5

G12	`=G7-G11`	NPV (equivalent equation for cells C12 to F12)
G13	`=G12/ABS(G11)`	ROI (equivalent equation for cells C13 to F13)
B15	`=-B10`	Yr 0 yearly NPV cash flow
C15	`=C6-C10`	Yr 1 yearly NPV cash flow
D15	`=D6-D10`	Yr 2 yearly NPV cash flow
E15	`=E6-E10`	Yr 3 yearly NPV cash flow
F15	`=F6-F10`	Yr 4 yearly NPV cash flow
G15	`=G6-G10`	Yr 5 yearly NPV cash flow
B16	`=B15`	Cumulative NPV Yr 0
C16	`=B16+C15`	Cumulative NPV Yr 1
D16	`=C16+D15`	Cumulative NPV Yr 2
E16	`=D16+E15`	Cumulative NPV Yr 3
F16	`=E16+F15`	Cumulative NPV Yr 4
G16	`=F16+G15`	Cumulative NPV a Yr 5

Note: The table provides a list of the various formulas used to conduct the feasibility economic analysis.