

Assignment - 6

Team	4 – Loblaws (alias used - Loblyst)					
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Table of Contents

1.	Introduction	. 3
2.	Summery of Existing Functionality	. 3
3.	Requirement Details	. 3
4.	Assumptions and Prerequisites	. 4
5.	Possible Solution 1	. 5
	Product Implementation (COTS Platform)	. 5
6.	Possible Solution 2	. 7
	Outsourcing Development & Maintenance	. 7
7.	Possible Solution 3	. 9
	Custom Development Solution	. 9
8.	Possible Solution 4	11
	Do Nothing Method	11
9.	Evaluation Criteria	12
	9.1 Comparative table	14
10	. Acronyms	16
11	. References	17



1. Introduction

This solution design report proposes and evaluates three approaches to enhance the Loblyst E-commerce platform, including three solution options and a baseline "no action" option for comparison. The objective is to identify the most effective solution aligned with Loblyst's business goals, functional requirements, and technical specifications. This report details the critical requirements, current capabilities, assumptions, and evaluation criteria for each option. Prioritized evaluation criteria—performance, scalability, usability, security, and cost—serve as the focus areas to ensure the selected solution delivers measurable improvements.

2. Summery of Existing Functionality

- User Authentication: Currently, it can allow customers to log in, register, and recover passwords. That
 is part and parcel with the fact that two-factor authentication, which is an excellent security measure,
 is not implemented here to some extent, and the same could be said for the integration of PC
 Optimum, which is also quite simple.
- **Product Browse and Search:** This leaves users little chance to filter them by attribute and suggested items in categories and search.
- Shopping Cart and Checkout: The option enables the customer to learn about the product, put it in
 the cart, view further cart details, and check out. The options available at the checkout do not allow
 for multiple pushes to complete an order quickly, while at the same time, there are not many options
 for an advanced checkout payment.
- Order Completion and Shipping: The solution will enable internal ordering by linking the local delivery
 chains. The order tracking is only in real-time; it needs to be clarified what some changed ordered
 status reports Company Futures Group.
- Customer Support: The basic support package offers email and phone support for customers who
 consult the platform for an affordable fee. It is a pity there is no ticketing system and, therefore, no live
 chat.
- **Performance and Mobile Optimization:** However, the site's loading is sluggish and has very low, almost negligible, mobile responsiveness, particularly during peak travel hours.
- PC Optimum Integration: PC Optimum is somewhat integrated and point synchronization during checkout has a similar problem.

3. Requirement Details

Performance Requirements:



Any page must be loaded for not than 2 seconds, and it takes not more than 1 second to react to an action – it must be as an instance. Click 'Add to Cart.' Usability Requirements: Those actions from home to check out can be accomplished in 3 or fewer clicks, and like a responsive website, the layout will adjust to mobile, tablet, and desktop presentations.

Security Features:

Everything personal should be put through encryption; two-factor login is used with notification sent before any login access.

Functional Requirements:

- User Authentication and Management: User login, PC optimum login, password reset, and two-factor authentication.
- Product Browse and Search: Search, sort, advanced search, and simple transitions from one category to another.
- Cart and Checkout: Place an item in the cart, view the cart's contents, and use a coupon for multiple payments and deliveries.
- Order Fulfillment and Delivery: Interoperate with the Inventory management system and let customers select delivery or pickup.
- Customer Support: Web chat, mailing lists, phone, ticketing system, etc.
- **Integration of PC Optimum Loyalty:** Make it possible to sync points for earning and redemption; enhance the problem that acts as a barrier in syncing.
- **Performance and Scalability:** The dependency on page load time under 3-5 seconds, uptimes of 99.9%, and the scalability or ability to support more than GTA growth.

4. Assumptions and Prerequisites

Assumptions include:

- The monthly traffic of the platform after launch will be 500,000 users.
- The conversion rate of customers shall increase by 5% after six months of launching this new platform.
- The feedback from the customers will be captured in at least 30% of the transactions that have been made through the platform.
- There is support that will try to fix issues within two hours of detection
- The marketing campaigns reach the target demographic and drive at least 10,000 new users monthly.

Prerequisites



- **Infrastructure Upgrade:** The site should provide extended server capacity and improvements in the database due to the expected growth and load.
- In the case of PC Optimum, the customer database that underlines it has to be correct and updated.
- **Compliance Readiness:** PIPEDA and GDPR: These are the mainstays of user information protection, which must be implemented on the platform.
- **Budget and Resources:** Reasonable budgeting should be allocated for testing, marketing, and integration with third-party services.

5. Possible Solution 1

Product Implementation (COTS Platform)

Choose a proper commercial e-commerce solution (e.g., Shopify Plus, Magento, or BigCommerce) to extend services beyond the GTA. This alternative provides an easy way to implement solutions with the possibility of custom configurations for order management, payment integration, and mobile compatibility, along with various other options.

1. High-Level Design

The solution outlines the implementation of a commercial off-the-shelf (COTS) e-commerce platform like Shopify Plus, Magento, or BigCommerce to allow for quick deployment out of the GTA. These platforms provide the basic necessary functions for;

- Order management: Built-in order tracking, processing, and fulfillment features
- Payment processing: Supports multiple payment options, including credit, debit, and potentially PC
 Optimum rewards.
- Mobile responsiveness: User-friendly design that ensures a smooth experience across all devices.
- **Data Flow:** The design encompasses the API links for data synchronization with the already existing Loblyst systems, thus maintaining the consistency of inventory, order tracking, and user profiles.

2. Low-Level Design

The low-level design includes the integration of essential features that are specific to Loblyst's requirements.

- User Authentication and Sign-In: Which gives the customers the option to use their PC Optimum to sign in to Loblyst and they can manage their profile easily.
- **Inventory Management and checkout Processing:** With real-time inventory updates and efficient checkout with secure payment options.



- **Order Fulfillment:** Automatically processes orders, provides tracking updates, and connects with shipping services for smooth delivery.
- **PC Optimum Integration:** Applies loyalty points to eligible purchases, making it easy for customers to use their rewards.

3. Impact Analysis

Positive Impacts:

- **Rapid Deployment:** With the help of faster implementation compared to custom developing, Loblyst might successfully penetrate new market in a short time period.
- Enhanced User Experience: Customer satisfaction and engagement can be improved by Mobilefriendly design and multiple payment options.
- **Scalability:** The platform can handle increased traffic and support multiple locations as Loblyst expands beyond the GTA.

Potential Negative Impacts:

- **Customization Limitations:** Limited ability to fully tailor features to Loblyst's unique needs, as the platform is pre-built.
- Dependency on Vendor: Loblyst may rely on the platform provider for system updates, security patches, and new feature releases.
- **Ongoing Costs:** Subscription fees and potential transaction costs increase long-term operational expenses.

4. Out of Scope

The project scope does not include certain elements that need extra development or tools that go beyond the present implementation. These elements include:

- Advanced Analytics: External tools for deeper data insights are not covered.
- Custom Features: Custom-built features which are specific to Loblyst's business needs.
- Non-E-Commerce Systems: Integration with complex ERP systems
- Offline retail integration: Such as combining in-store and online data, would require separate
 development outside of the current deployment.

5. Risk and Mitigation



Key risks include platform limitations in terms of unique needs, vendor reliance for upgrades, issues of data security, and subscription costs. Such risks can only be minimized if there is a careful assessment of the capability of the platforms and the trustworthiness of the vendors. High concern with protection laws related to data such as GDPR and PIPEDA, and the need to budget for long-term costs are major issues to consider for the effective management of regular operational expenses.

6. Possible Solution 2

Outsourcing Development & Maintenance

1. High-Level Design

It outlines how the outsourcing option can be done effectively with some high-level design strategies.

- **Strategic Partner Selection:** Conduct specific market research and involve a proven established third-party provider of website design services, order fulfilment, and customer relations.
- **Service Agreement:** Sign a Service Level Agreement (SLA) detailing the terms of performance requirements, expected behaviour and the contract.
- Integration Plan: Enumerate the role and function of how the vendor establishes structures and system designs that can link up with the systems of Loblyst to power the latter's e-commerce pipelines and have comfortable data transfer between these platforms and other organisational databases.
- Performance Monitoring: To evaluate performance, measures such as the loading rate and the order accuracy rate shall be tracked continuously and can be utilised to provide frequent updates on the KPIs.

2. Low-Level Design

The low-level design of the solution includes the technical aspects and specific components that need to be addressed in the outsourcing solution. Those are detailed below:

- Security Measures: To protect customer data, specific measures of security such as data encryption, multi-factor user authentication, and compliance checks must be implemented during the data exchange.
- **Data Integration or scalability:** The system should design such APIs that should allow effective and secure transfer of data between Loblyst and the vendor's systems.
- **Order Processing Workflow:** The vendor shall state and evaluate how orders are placed and what happens in the order processing process on the vendor end.
- **Customer Support Framework:** Evaluate how Loblyst' support channels (e.g., chat, email, phone) should be integrated with the vendor's support system.



• **Website Maintenance Plan:** Create a timeline for content updates, improvement of the website's performance, and solving issues on both sides: internal employees and the vendor.

3. Impact Analysis

The potential benefits and challenges of outsourcing for Loblyst are analysed below:

Positive Impacts

- Cost Savings: Outsourcing; the development and maintenance of those services are done internally at lower costs.
- **Focus on Core Business:** Loblyst can shelter other competencies from value chain as fundamental business strategies such as marketing and supply chain.
- Scalability: Experiences to expand services as the business expands, and there is no necessity for additional internal structures.
- **Improved Performance:** Take advantage of vendors' help to increase website efficiency and improve customers' service.

Negative Impacts:

- Dependency on Vendor: Lack of diversification that comes with relying heavily on the vendor; it may
 lead to a total stagnation of operations by the organization in case the vendor is unwilling or unable to
 supply satisfactorily.
- Data Security Concerns: Outsourcing brings the possibility of the data breach, which in turn limits compliance with the laws of privacy.
- **Potential for Misalignment:** Lack of organizational culture or weak communication channels may cause a misfit in services being offered

4. Out of Scope

The activities and services that are not part of this outsourcing arrangement are as follows:

- **In-House Marketing:** Never will social media marketing, major advertising, or corporate communication initiatives go beyond Loblyst.
- Logistics & Supply Chain: Logistics and supply chain management shall remain a central function as is the case currently; the vendor shall not be involved in this aspect.
- **Non-E-Commerce IT Systems:** Legacy IT systems not directly associated with the e-commerce site, including stores' systems and applications for employees' management, are not considered.
- Data Ownership: All customers' and transactions' information will be owned by Loblyst; the vendor
 will not be entitled to use data for purposes other than offering services.



5. Risk and Mitigation

We have identified the following risks associated with outsourcing and strategies to mitigate them.

- Vendor Reliability and Non performance: Before choosing the vendor, conduct thorough research on them and find alternate ways to handle them in case of non -performance. Some clauses need to be added to the SLA.
- **Data Security:** Employ high-standard data security measures like encryption to the endpoint and undertake frequent security check-ups in compliance with the data protection laws.
- **Service Misalignment:** Conduct performance reviews regularly with the vendor with the aid of clear documentation and proper communication channels.
- **Hidden/ Additional Costs:** Some additional costs that might be incurred ought to be addressed in the contract. A contingency reserve budget is to be allocated to handle these unprecedented costs.
- **Customer Experience Impact:** The transition should be made gradually phase by phase to reduce the impact on customers. Allow for feedback and continuous improvement based on user reviews.

7. Possible Solution 3

Custom Development Solution

The option for custom development is to improve the existing Loblyst e-commerce website, which will allow new features in collaboration with the existing system to give our customers a better experience.

1. High-level design

The goal is to develop a seamless checkout process for new and existing Loblyst customers, which will be designed in line with user requirements to ensure needs are met.

- Create unique functionalities like customized product suggestions, smooth payment procedures, and improved user interaction explicitly designed for client requirements.
- Simplify the user interface (UI) in front-end development to enhance the shopping experience.
- Improve the backend to include a better database structure for quicker product searches and more secure payment gateways.
- Linking other fulfilment centers, logistics partners and financial institutions.
- Implementing IT frameworks that ensure the backend database is secure.

2. Low-Level design



- Integrate artificial intelligence to help promote new products, sales and new locations when available.
- Provide multiple payment options with strong security features to authenticate payment and user.
- Customer profiles should be customized so they can view previous purchases, track orders and suggestions for new products using the algorithm of their experience on the site.

Stages of Growth:

- Phase 1: Involves gathering requirements and creating an initial design.
- Phase 2: Creation and first round of testing.
- Phase 3: involves thorough user acceptance testing (UAT) and deployment.

3. Impact Analysis

Business Benefits

- Increased customer interaction on the site through personalized experience.
- Visitor-to-customer conversion rate will increase due to a simpler experience while shopping.

Challenges

- Cost
- Extended Timelines
- Post-deployment support

4. Out of Scope

- Unnecessary additions such as specialized marketing tools are unnecessary in the beginning stage.
- Migration to a cloud platform, unless explicitly required as an integrated necessity.

5. Risk And Mitigation

- **Timeline:** Adopting the Agile approach, a clear roadmap of project milestones will mitigate delays in timelines.
- Exceeded Budget: Strict project scope management will ensure the expense aligns with the budget.
- Scope Creep: Clear-defined goals and regular communication will mitigate any form of scope creep.
- **Mitigation plan:** Regular review sessions will be held to keep stakeholders updated and ensure everything stays aligned with the project plan.



8. Possible Solution 4

Do Nothing Method

Inert strategy is the benchmark against the other choices since no changes or enhancements are made to the current Loblyst e-commerce platform. As such, it offers an answer to the different options, telling what may happen if nothing is done to change the current system (Team 4, 2024, p. 4)

1. High-Level Design

- **Current State:** This design assumes that the platform shall remain this way, and no more resources shall be invested in performance, scalability, or even the user experience.
- **Fundamental Components:** Customer identification, a straightforward kind of product discovery, where options include searching, purchasing, payment, and order delivery, and a minimal connection with the PC Optimum rewards program.
- **System Performance Expected:** Lacks current infrastructure, is expected to run regularly and less often faster, may slow down when usage is high, and may need help with the scalability of traffic load.

2. Low-Level Design

- **User Authentication:** The accounts can be reset using basic password recovery hacking techniques, which usually only require one form of identification. It lacked the features such as two-factor authentication and improved security.
- Database Management: Set an Oracle-based system for the database and homegrown CRM for customer records; no extra place for expansion.
- **Customer Experience:** Lack of mobile responsiveness, slow checkout section. I am still struggling to ensure the synchronizing of the PC Optimum points at the time of payment.
- Order Fulfillment: customers still expect overnight logistics and delivery processes to remain the same.
 It can only process orders mainly with the GTA and has little utility in terms of client notification and order status tracking.
- **Customer Support:** No application for instant support, such as ticket support and/or live chat; thus, users may only contact through email and phone.

3. Impact Analysis

• **Performance Impact:** There is no change in load time or response time; they will most likely continue to get slow performance as soon as the site gains much traffic.



- Scalability Impact: Being unable to manage the expansion plan outside the GTA easily and being restricted in terms of volume orders.
- Customer Satisfaction Impact: Performance issues that customers constantly complain about, incorporation of PC Optimum that needs to be better incorporated, and the absence of mobile optimization are likely to reduce the satisfaction and the number of customers.
- **Security Impact:** There's more risk since there is no two-factor authentication and no rigorously encrypted secure customer information.

4. Out of Scope

- **Core Functionality Enhancement:** They must strengthen many common attributes of most user-friendly online shopping websites, such as the actual feel, check-out process, and stock.
- **Scaling:** Any increase of operation volume beyond GTA that maintains, increases, or expands warehousing, server, or logistics requirements is prohibited.
- Integration of New Systems: Built-in with no third-party tool compatibility, improved PC Optimum loyalty program, and more payment gateways.
- Marketing and Customer Support Improvements: It remains the same with customer support channels, marketing communications, and any other strategy to increase capture.

5. Risk and Mitigation

- **Reduced Customers' Satisfaction:** Once again, it shall be accepted that there will be an effect on customer satisfaction, which may result in customer attrition and, consequently, low customer loyalty.
- **Scalability Limitations:** Set up a contingency should there be slow operation in processing orders or organizing the stocks during specific peak periods within the GTA.
- **Security Vulnerabilities:** Some requirements include monitoring the message and keeping minimal security standards for the prevention of data leaks or theft.
- Competitive Disadvantage: Understand that competitors with a more robust platform may take
 market share recognition of emerging markets to come and design a plan for enhancements that could
 be required at some point down the line.

This "Do Nothing" option gives the customers/citizens the potential negative consequences of staying on the same course and, therefore, provides a basis for comparison of improvement options to be implemented.

9. Evaluation Criteria



Based on the solution design report and project details, here is a refined set of evaluation criteria to guide the selection of the most suitable solution for Loblyst's e-commerce platform:

- 1. **Performance and Reliability [20]**: Evaluate how well each solution meets the platform's performance goals, including load times of less than 3-5 seconds, high responsiveness, and consistent uptime (99.9%) under increased traffic demands.
- Scalability [15]: Assess the solution's capacity to support Loblyst's expansion beyond the GTA, with the
 flexibility to handle more users, increased traffic, and additional product and service offerings as the
 company grows.
- 3. **User Experience (UX) [20]**: Evaluate how each solution can improve user engagement with features like responsive design, easy navigation, and a streamlined checkout process, aiming to boost conversion rates and minimize cart abandonment.
- 4. **Cost Effectiveness [15]**: Examine the initial and ongoing costs, including development, subscription fees, maintenance, and potential hidden expenses. The chosen solution should fit within Loblyst's budget constraints while delivering a reasonable ROI.
- 5. **Security and Compliance [10]**: Ensure that the solution complies with data protection regulations such as GDPR and PIPEDA and provides robust security features (e.g., data encryption, two-factor authentication) to safeguard customer information.
- 6. **Integration Capabilities [10]**: Evaluate each option's ability to integrate smoothly with Loblyst's existing systems, including PC Optimum for loyalty points, inventory management, and multiple payment gateways.
- Time to Market [5]: Consider the estimated implementation timeline to ensure the platform is operational promptly, enabling Loblyst to reach new customers and capitalize on market opportunities sooner.
- 8. **Maintenance and Vendor Support [5]**: Analyse the ongoing support and maintenance needs of each solution, including vendor support if applicable, to ensure long-term stability and performance.
- 9. **Customization and Flexibility [10]**: Assess each solution's ability to accommodate Loblyst's unique business requirements, including custom features and future modifications as business needs evolve.
- 10. **Customer Satisfaction Impact [10]**: Measure the potential impact on customer satisfaction, with a focus on providing a seamless, reliable, and secure shopping experience that aligns with Loblyst's brand goals.



9.1 Comparative table

Here's a comparative table for all four solutions (Product Implementation, Outsourcing, Custom Development, Do Nothing) using the evaluation criteria, with Product Implementation selected as the best option.

Criteria	Product	Outsourcing	Custom Development	Do Nothing
Performance and Reliability	Implementation High performance with built-in optimization for e-commerce, ensuring load times of under 3 seconds.	Moderate reliability, depends on vendor's system and performance consistency.	High performance if developed effectively, but longer time to achieve and optimize.	Low; current system performance remains sluggish and unreliable.
Scalability	Highly scalable with cloud integration options, ideal for expansion beyond GTA.	Scalable depending on vendor capabilities, though integration may be limited by third-party service limitations.	Highly scalable, but more complex and costly to design for future growth.	Very limited; cannot support expansion beyond current capabilities.
User Experience (UX)	Improved UX with mobile-responsive design, faster checkout, and customizable templates.	UX improvements possible through vendor customization, but limited flexibility and control.	Customizable UX tailored to Loblyst's needs, but high effort and cost for effective results.	Low; current UX limitations would persist, leading to customer dissatisfaction.
Cost Effectiveness	Cost-effective with a subscription-based model and predictable expenses.	Potentially lower upfront cost, but long-term vendor fees may accumulate and increase operational costs.	High initial and maintenance costs due to custom development; ROI may take longer.	No new costs, but potential for revenue loss due to inadequate service quality.
Security and Compliance	Strong security and compliance features built-in, meeting GDPR and PIPEDA standards.	Depends on vendor's security measures, potential risk with data handling by third-party.	High security can be customized, though requires significant resources to implement fully.	Low; current security vulnerabilities would remain unaddressed.
Integration Capabilities	Supports integration with PC Optimum, payment gateways, and inventory management through APIs.	Limited control over integrations, dependent on vendor's capability to meet Loblyst's specific needs.	Customizable integration options, allowing close alignment with Loblyst's existing systems, but requires more development.	Limited integration options; existing PC Optimum integration issues persist.
Time to Market	Fast deployment due to pre-built platform, allowing Loblyst to launch quickly and capture new markets.	Moderate; dependent on vendor's project timeline, onboarding, and SLA.	Longer time due to extensive custom development, delaying entry to new markets.	Immediate, but no improvements mean missed opportunities for customer expansion.
Maintenance and Support	Regular updates, maintenance, and vendor support	Vendor-managed support, though dependence on third-	In-house support required, demanding	Minimal maintenance, but current support



Criteria	Product Implementation	Outsourcing	Custom Development	Do Nothing	
	included in the subscription model.	party responsiveness can affect stability.	additional resources for long-term stability.	limitations continue to impact performance.	
Customization and Flexibility	Moderately customizable with templates and addons, fitting most of Loblyst's unique needs.	Limited flexibility; vendor's customization offerings may not fully align with Loblyst's requirements.	Highly flexible, fully tailored to Loblyst's specifications, but high costs for custom features.	None; current platform cannot be customized for improved performance.	
Customer Satisfaction Impact	Significant; improved UX, security, and reliability enhance overall satisfaction, boosting brand value.	Moderate; improvements possible but dependent on vendor's UX focus and support quality.	High potential for satisfaction due to tailored features, though risk of delayed satisfaction if development is prolonged.	Low; current system issues persist, leading to reduced customer satisfaction.	

Criteria	Weight	1- Product Implementation	1- Weighted Score	2- Outsourcing	3- Weighted Score	3- Custom Development	4- Weighted Score	4- Do Nothing	4- Weighted Score
Performance and Reliability	20	90	1800	70	1400	85	1700	40	800
Scalability	15	90	1350	60	900	80	1200	30	450
User Experience (UX)	20	85	1700	70	1400	90	1800	50	1000
Cost Effectiveness	15	80	1200	70	1050	60	900	95	1425
Security and Compliance	10	85	850	65	650	80	800	40	400
Integration Capabilities	10	90	900	70	700	85	850	30	300
Time to Market	5	95	475	70	350	40	200	100	500
Maintenance and Support	5	90	450	60	300	70	350	50	250
Customization and Flexibility	10	80	800	60	600	90	900	30	300
Customer Satisfaction Impact	10	90	900	70	700	85	850	40	400
TOTAL			10425		8050		9550		5825

Selected Solution: Product Implementation

Justification: Product Implementation provides a balance of scalability, performance, and cost-effectiveness, enabling Loblyst to quickly enhance its platform, improve customer experience, and expand beyond GTA without high upfront costs.



10. Acronyms

- ✓ PC President's Choice
- ✓ GTA Greater Toronto Area
- ✓ NPS Net Promoter Score
- ✓ CRM Customer Relationship Management
- ✓ ROI Return on investment
- ✓ ERP Enterprise resource planning
- ✓ GDPR General Data Protection Regulation
- ✓ **PIPEDA** Personal Information Protection and Electronic Documents Act
- ✓ **UX** user experience
- ✓ SLA Service level agreement



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