**1. Scope**

The objective of this project is to implement a Customer Churn Prediction System that will enable Loblaws to proactively identify at-risk customers and enhance retention strategies. Key deliverables include:

* Automated data extraction and ETL processes from CRM and transactional databases.
* Development of predictive models to forecast churn risk.
* Creation of interactive dashboards (Power BI/Tableau) to monitor customer engagement and churn KPIs.
* Integration with Loblaws’ existing systems to enable proactive intervention and reduce churn by at least 10% within 12 months.

2.**System(s) Impacted**

The following systems will be impacted:

* CRM System: Primary source of customer demographic and interaction data.
* Transactional Databases: Source of purchase history and behavioral data.
* Data Warehouse: Repository for aggregated and transformed data.
* ETL Tools: Used for automating data extraction, transformation, and loading.
* BI Platforms (Power BI/Tableau): Used for dashboard creation and visualization.
* Predictive Modeling Environment: Used for building, testing, and deploying machine learning models.
* User Access & Security Systems: Ensures role-based access to dashboards and data analytics tools.

3. **Assumption(s)/Dependencies**

Data Accuracy: Assumes data from CRM and transactional systems is accurate and updated regularly.

Sandbox Environment: A testing environment is available for system exploration and validation.

Stakeholder Availability: Key stakeholders (Marketing, Customer Service, IT, and Analytics teams) are available for interviews and JAD sessions.

Resource Availability: Adequate technical resources (Data Engineers, Data Scientists, BI Developers) are allocated for project execution.

Technology Stack: Assumes existing infrastructure supports integration with ETL, BI, and machine learning platforms.

Regulatory Compliance: All data handling will comply with Loblaws’ internal policies and external regulatory requirements.

4. **As-Is Business Process (Activity Diagram)**

5. **To-Be Business Process (Activity Diagram)**

**6. Requirements**

**6.1 Requirements: ‘Dashboard’ Page**

| **ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| FR-01 | The system shall display a real-time churn risk dashboard accessible via Power BI/Tableau. | Critical |
| FR-02 | Dashboard shall provide key churn KPIs (e.g., churn rate, retention rate, high-risk customers list, engagement trends). | Critical |
| FR-03 | Dashboard shall include filtering options (e.g., date range, customer segment, store region) for customized reporting. | High |
| FR-04 | Dashboard shall auto-refresh every 15 minutes to display the latest data insights. | High |
| FR-05 | Users shall be able to export reports in PDF/Excel format for external sharing. | High |

**6.2 Requirements: ‘Predictive Model’ System**

**6.2.1 Predictive Model Data Inputs**

| Field Name | Field Type | Content | Required | Min. Char. | Max. Char. | Notes |
| --- | --- | --- | --- | --- | --- | --- |
| Customer ID | Numeric | Unique Identifier | Yes | 6 | 12 | Used for tracking customer records |
| Purchase Frequency | Numeric | Number of transactions per month | Yes | 1 | N/A | Captures customer engagement |
| Last Purchase Date | Date | YYYY-MM-DD format | Yes | N/A | N/A | Measures recency of purchase |
| Engagement Score | Numeric | customer engagement score | Yes | 0 | 100 | A higher score = Higher engagement |
| Churn Risk Score | Numeric | Probability of customer churning (%) | Yes | 0 | 100 | Predicted by ML model |

**6.2.2 Predictive Model Processing**

| **ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| FR-06 | System shall use historical customer data to train churn prediction models using machine learning techniques. | Critical |
| FR-07 | Predictive model shall calculate a Churn Risk Score (0-100%) for each customer | Critical |
| FR-08 | System shall update the churn risk predictions daily based on new customer activity. | High |
| FR-09 | System shall allow adjustment of model parameters for continuous performance improvement. | High |

**6.3 Requirements: ‘Customer Retention Alerts’ System**

| **ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| FR-10 | System shall generate automated alerts when a customer’s Churn Risk Score exceeds 70%. | Critical |
| FR-11 | Alerts shall be sent to marketing and customer service teams via email and dashboard notifications. | High |
| FR-12 | Alerts shall contain customer details, engagement history, and suggested retention actions. | High |

**6.4 Requirements: ‘User Access & Security’ System**

| **ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| **FR-13** | System shall provide role-based access control to manage data security. | Critical |
| **FR-14** | Only authorized users (e.g., Marketing, Customer Service, Data Analysts) shall access churn dashboards and reports. | High |
| **FR-15** | All access logs shall be tracked and stored for security auditing. | Medium |