Change Request Proposal

Enhancing Dron Teq System Capability for Canadian Operations

Date: April 26, 2025

Course: ISM3113.902S25

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Work Group: 2

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Planning Phase

DronTeq provides drone flight services and data analysis and currently operates within the U.S. only. As business operations expand into the Canadian market, the existing system requires adjustments in regulatory compliance, payment processing, geographic coverage, and operational procedures. This document outlines the necessary changes to support Canadian operations.

Analysis Phase

Updated Requirements:

Category	Requirement Details

Operational Requirements	
Technical Environment	1.1 The system will work over the Web with any browser 1.2 Non-Registered customers using mobile devices will access the system using the mobile device browser 1.3 Registered clients and pilots using mobile devices will access a rich Internet application from the mobile device browser
System Integration	1.4 The informational portion of the system will read content from the drone database in the Sales system. No write access is allowed. 1.5 The portion of the system for registered clients and pilots will read and write to the client, pilot, flight request, and flight bid datastores 1.6 Data from completed drone flights must be uploaded from anywhere into the DrōnTeq Amazon S3 cloud storage 1.7 Clients can download completed drone video from the DrōnTeq Amazon S3 cloud storage 1.8 Clients can download completed data analyses from the DrōnTeq Amazon S3 cloud storage 1.9 Weather and Airspace Restrictions 1.10 Integration with Canadian Mapping and GIS Data
Portability	1.11 iOS and Android devices are supported
Maintainability	1.12 iOS and Android devices are supported
Performance Requirements	

Speed	2.1 Response times must be less than 7 seconds 2.2 Upload and download speeds must be maintained above the industry norm
Capacity	2.3 There will be a maximum of 100 simultaneous users at peak use times 2.4 The system will support streaming video to up to 50 simultaneous users
Availability	2.5 The system should be available 24/7

Reliability	2.6 The system shall have 99% uptime performance
Security Requirements	
System Value	3.1 The system has high strategic value and is essential to the functioning of the new Client Services business unit
Access Control/Authentication	3.2 Registered clients and pilots will access their accounts with username and password 3.3 Transport Canada Pilot Certification Verification
Encryption	3.4 Client payment information must be transmitted securely 3.5 Drone data uploads and completed drone videos and data analyses must be transmitted securely
Virus Control	3.6 All standard virus controls are mandated
Cultural and Political Requirements	
Multilingual	4.1 French Language Support
Customization	4.2 Pilots will be provided customization options for the pilot dashboard 4.3 Adjust Mobile App for Canadian Localization 4.4 Bidding System Adaptation for Canadian Market 4.5 Flight Service Taxes & Pricing Adjustments 4.6 Support for Canadian Provinces and Territories
Unstated Norms	4.7 Canadian Payment Methods
Legal	4.8 Legal Compliance for Data Storage

Updated Use Cases:

Use Case Name: Notify Pilots of New Flight Request (US & Canada) | ID: UC-2A | **Priority**: High

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Actor: Flight Request system

Description: This use case describes how the system notifies pilots of a new flight request in the U.S. or in Canada, ensuring compliance with airspace laws, pilot certifications, and bilingual communication standards.

Trigger: New Flight Request is submitted by client (described in UC-1: Create Flight Request)

Type:

☑ External

☑ Temporal

Preconditions:

1. New Flight Request is submitted and confirmed by client
2. Flight Assignment application is available and online
3. Canadian-specific modules are activated for request in Canada.

Normal Course:

1.0 Notify pilots of new flight request (U.S. or Canada)

1. System obtains the flight request
2. System uses the latitude/longitude of the flight area to define the flight proximity region
3. System determines if flight request is for U.S. or Canada.
4. System develops a list of pilots in the flight proximity region
5. System develops price guidelines for the flight based on the characteristics of the flight request and assesses appropriate sales tax, GST, HST, PST for the request.
6. System prepares a bilingual (English/French) flight request notification for all pilots in the flight proximity region, including location (province/territory if Canada), requested flight features, price guidelines, and opening/closing date/time of the pilot bidding window
7. System transmits flight request notification to all pilots in the flight proximity region
8. System stores new flight request notification
9. Pilot dashboards for all pilots receiving the flight notification are modified to include the flight request notification with a bidding window countdown clock

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Postconditions:

1. New bilingual (English/French) flight request notification record created and stored
2. Pilots in the flight proximity region receive flight notification message

3. Pilot dashboards for the notified pilots are modified

Exceptions:

1. No pilots are found in the flight proximity region (occurs at step 3)
2. System increases the radius of the distance from the flight location by 25 miles
3. Return to step 2, Normal Course, to recalculate the flight proximity region

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Summary Inputs / Outputs Table

Inputs	**Source**	**Outputs**	**Destination**
Flight Request	Create Flight Request use case	Bilingual Flight Request Notification Message	Pilots
Flight Location	Flight Request	New Flight Request Notification Record	Notification Datastore
Pilot Locations	Pilot Datastore	Pilot Dashboard Update	Dashboard of Notified Pilots
Flight Details (US or Canada)	Flight Request		
Pricing Guidelines	Price Guide Datastore		

Use Case Name: Pilot Submits Bid (U.S. & Canada) | ID: UC-2B | **Priority**: High

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Actor: Pilot

Description: This use case describes how a pilot submits a bid for an open flight request, with expanded capabilities to support Canadian pilots, airspace laws, certifications, and bilingual communications.

Trigger: Pilot received notification of new flight request (U.S. or Canada)

Type:

☑ External

☑ Temporal

Preconditions:

1. Pilot is authenticated and signed into his/her dashboard
2. Open flight request is displayed on pilot dashboard
3. Bilingual (English/French) Flight request application is available and online

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Normal Course:

1.0 Submit Pilot Bid (U.S. or Canada)

1. Pilot selects the new flight request displayed on dashboard
2. System displays details of the flight request including location (U.S. and Canada), requested flight features, price guidelines (adjusted for GST/HST/PST if Canada), opening/closing date/time of the pilot bidding window, language based on user preference (English/French)
3. Pilot selects “Submit a bid” option
4. System displays Flight bid form
5. Pilot enters bid price (adjusted for Canada currency CAD) and planned date/time for flight
6. System verifies that bid meets the terms of the flight request. If no errors, continue; if errors, display error message and return to step 5
7. System requests pilot confirmation of the bid
8. System stores new Flight Bid record

Postconditions:

1. New flight bid is stored
2. Canada bids are flagged for localized tax adjustments

Exceptions:

1. Bidding window is closed (occurs at step 7)
2. Date/time of pilot confirmation is after the closing
3. Modify status of flight bid to “invalid/late”
4. Save flight bid record

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5. Notify pilot of late submission bid status

Summary Inputs / Outputs Table

Inputs	**Source**	**Outputs**	**Destination**
Flight Request record	Flight request datastore	Flight bid record	Flight bid datastore
Flight request notification details	Flight Request notification datastore	Flight bid status	Pilot
Flight bid details	Pilot Datastore		
Bid confirmation	Pilot Datastore		

Use Case Name: Select Winning Flight Bid | ID: UC-2C | **Priority**: High

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Actor: Flight Operations Manager

Description: This use case describes how the Flight Operations Manager finalizes the selection of the winning flight bid on a flight, including consideration for regional compliance, language preference, and tax implications.

Trigger: A flight bid window has closed.

Type:

☑ External

☑ Temporal

Preconditions:

1. Flight Operations Manager is authenticated 2. Bidding window on a flight request has closed.
3. Bilingual (English/French) bidding summaries

Normal Course:

1.0 Select Winning Flight Bid

1. System posts "closed to bid" message (bilingual if Canadian) on pilot's dashboard
2. Flight Operations Manager requests list of all bids for the flight 3. System displays list of all bids 4. For each bid:
   a. The flight manager verifies the drone's capability to perform the flight
   b. Bids based on drones without required equipment are marked "Not Qualified," updated, and removed from bid list
5. System sorts and ranks remaining bids based on flight completion time and bid price (including CAD conversion and tax adjustments for Canada flights)
6. Flight Operations Manager selects bid that optimizes flight completion time and bid price
7. System changes status of all unselected flight bids
8. System sends bilingual (English/French) notification message to selected bid pilot
9. System posts flight details on selected pilot's dashboard
10. System notifies all other bidding pilots of the final selection
11. System notifies customer that flight has been assigned to a pilot
12. System updates Flight Request with flight assignment details

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Postconditions:

1. Pilot of selected bid is notified (English/French)
2. Selected pilot's dashboard is updated with flight details
3. Pilots' bids not selected are notified
4. Flight bid records selection status is updated
5. Client notified of flight assignment
6. Flight Request record updated with flight assignment

Exceptions:

1. No bids submitted (occurs at Step 2)
2. Flight Operations Manager modifies flight proximity area and/or price guidelines (including Canadian currency and tax obligations).
3. Flight Operations Manager performs Use Case 2A to re-post modified Flight Request
4. If Flight Request has been posted twice with no bids, the Flight Operations Manager will contact the client; exit the use case

Summary Inputs / Outputs Table

Inputs	Source	Outputs	Destination
Flight Bid Records	Flight Bid Datastore	Bidding Window Closed	Pilot Dashboards
Pilot Drone Details	Pilot Drone Datastore	Updated Flight Bids	Flight Bid Datastore
Flight Request Details	Flight Request Datastore	Bid Award Notification	Selected Pilot
Qualified Flight Bids	Flight Bid Datastore	Awarded Flight Details	Selected Pilot Dashboard
	Unsuccessful Bid Notice	Unselected Pilots	
	Assigned Flight Notice	Flight Client	
	Assigned Flight Request	Flight Request Datastore	

Design Phase

1. Architecture Adjustments

- **1.9 Weather and Airspace Integration:**
  The system will integrate **Environment Canada's API** to provide **real-time weather conditions** and display **restricted airspaces** across Canada. This ensures that drone flight planning tools are updated with accurate, localized weather information, crucial for safe operation.
- **1.10 Canadian GIS Mapping Services:**
  Utilize **Natural Resources Canada** for accurate **topographical maps** and **land-use data**. These maps will improve drone navigation, flight path optimization, and compliance with terrain-based restrictions.
- **4.1 Bilingual Support Infrastructure:**

The system will include full **bilingual support**, requiring architectural changes to enable **dynamic language switching** across all modules. A **translation management system** will be developed in the back-end to support content in both **English and French**.

- **4.3 Regional Selector:**
  Implement a **regional detection system** (or manual selector) that distinguishes between U.S. and Canadian users. This will adjust **currency display (USD/CAD)**, load **legal disclaimers**, and activate **Canada-specific modules** such as tax and certification checks.

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2. User Interface (UI) Changes

- **4.1 Language Switching in UI:**
  Update all user-facing elements (menus, forms, notifications) to support **bilingual operation**. Users can switch between **English and French**, and the system will remember preferences for future sessions.
- **4.5 Pricing and Tax Display:**
  The UI will dynamically adjust to show pricing in **CAD** for Canadian users, with automatic application of **provincial taxes** (**GST**, **HST**, or **PST**) based on the user's location.
- **4.6 Canadian Address Format:**
  Modify all address input forms to support **Canadian provinces/territories** and **postal codes** (e.g., A1A 1A1 format). This ensures accurate client location input and correct tax calculation.

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3. Program Design Updates

- **3.3 Transport Canada Certification Verification:**
  Enhance the flight request process to include verification of **RPAS pilot certifications** issued by **Transport Canada**. Only certified pilots (Basic or Advanced RPAS) will be able to schedule and operate drone flights in Canada.
- **4.4 Bidding System Adaptation:**
  Modify the bidding system to reflect **Canadian market conditions**:
  - Adapt pricing models to account for **local cost variations**.
  - Ensure bids are **tax-inclusive** in **CAD**, considering different provincial tax rates.
- **4.7 Canadian Payment Integration:**

Integrate **Interac**, **Visa Debit**, and major **Canadian banks** into the payment gateway. Transactions will be processed securely in **CAD**, and receipts will include tax breakdowns for compliance.

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4. Data Storage Requirements

- **4.8 PIPEDA Compliance:**
  All personal and operational data collected in Canada will be stored in a **PIPEDAcompliant** manner:
  - **Encryption** for all personal, payment, and flight data.
  - **Access controls** restricting data access to authorized personnel only.
  - **Audit trails** for all data access and modifications.
- **1.6 – 1.8 Amazon S3 Storage:**
  Continue using **Amazon S3** for data storage, but ensure Canadian flight data (videos, analyses) is **tagged** or stored **separately** for **legal compliance**. Enable secure, regionspecific data upload and download features.

Implementation Phase

1. Changes to Pilots, Clients, and Operational Processes

1.1 Pilot Certification Verification

- A new system component will be deployed to verify **Transport Canada RPAS certifications** (Basic and Advanced) before pilots can operate in Canada.
- This will affect both **pilot onboarding** and **flight scheduling**, ensuring only certified pilots participate in Canadian operations.

1.2 Canadian Payment Methods

- The payment system will be extended to process **Canadian transactions**, supporting **Interac**, **Visa Debit**, and payments in **CAD**.
- Invoices and receipts will include **province-specific taxes (GST, HST, PST)**.

1.3 Flight Operations Compliance

- The **flight assignment system** will be updated to incorporate **NAV CANADA** airspace regulations.

- All Canadian flights must pass **automated checks** for legal flight zones before confirmation.

1.4 Regional Adaptation

- The system will automatically detect Canadian users and apply **regional settings**, including:
    - **Metric units** for distances and speeds. ○ Display of **Canadian legal disclaimers**.
    - Adjustment of interface to **French/English** based on user preference.
    - **Real-world scenario testing** will be conducted where test users simulate Canadian interactions to validate correct application of these settings.

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2. Testing Strategy

2.1 Bilingual Functionality Testing

- The entire user interface and communication system will undergo **bilingual testing** to ensure flawless operation in both **English and French**.
- Test cases will focus on **language switching**, content accuracy, and cultural appropriateness.

2.2 Compliance and Security Testing

- Conduct **PIPEDA-compliance audits** to verify:
    - **Data encryption**. ○ **Access control**.
    - **Canadian data segregation** in cloud storage. **2.3 System Performance Testing**
- Perform **load testing** to confirm the system supports:
    - **100 simultaneous users**.
    - **50 concurrent video streams**.
    - Response times of **less than 7 seconds**, even with Canadian-specific modules active.

2.4 Regional Simulations

- Simulate **flight requests** across Canadian provinces to ensure:
    - Accurate **tax calculations**. ○ Proper use of **mapping/weather data**. ○ Full compliance with **regional flight restrictions**.

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3. Training and Documentation

3.1 Bilingual Training Materials

- Develop **English and French** training manuals, video guides, and quick-reference sheets for:
    - **Pilots** (focusing on certification, flight planning, and compliance).
    - **Clients** (covering payment processes, booking, and customer support access).

3.2 Staff Training

- Train **support staff** to handle:
    - **Bilingual support** for Canadian clients.
    - Questions regarding **regional taxes**, **flight restrictions**, and **legal compliance**.

3.3 Updated Documentation

- All operational documents will be revised to include: ○ **Transport Canada** and **NAV CANADA** rules. ○ **Canadian payment** and **tax handling** procedures. ○ Region-specific **terms of service** and **privacy policies**.

1. Changes to Pilots, Clients, and Operational Processes	

Pilot Certification Verification	1.1 A new system component will be deployed to verify **Transport Canada RPAS certifications** (Basic and Advanced) before pilots can operate in Canada. 1.2 This will affect both **pilot onboarding** and **flight scheduling**, ensuring only certified pilots participate in Canadian operations.
Canadian Payment Methods	1.3 The payment system will be extended to process **Canadian transactions**, supporting **Interac**, **Visa Debit**, and payments in **CAD**. 1.4 Invoices and receipts will include **province-specific taxes (GST, HST, PST)**.
Flight Operations Compliance	1.5 The **flight assignment system** will be updated to incorporate **NAV CANADA** airspace regulations. 1.6 All Canadian flights must pass **automated checks** for legal flight zones before confirmation.
Regional Adaptation	1.7 The system will automatically detect Canadian users and apply **regional settings**, including: • **Metric units** for distances and speeds.

	• Display of **Canadian legal disclaimers**. • Adjustment of interface to **French/English** based on user preference. • **Real-world scenario testing** will be conducted where test users simulate Canadian interactions to validate correct application of these settings.
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System Performance Testing	2.4 Perform **load testing** to confirm the system supports: • **100 simultaneous users**. • **50 concurrent video streams**. • Response times of **less than 7 seconds**, even with Canadian-specific modules active.
Regional Simulations	2.5 Simulate **flight requests** across Canadian provinces to ensure: • Accurate **tax calculations**. • Proper use of **mapping/weather data**.

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Staff Training	3.2 Train **support staff** to handle: • **Bilingual support** for Canadian clients. • Questions regarding **regional taxes**, **flight restrictions**, and **legal compliance**.
Updated Documentation	3.3 All operational documents will be revised to include: • **Transport Canada** and **NAV CANADA** rules. • **Canadian payment** and **tax handling** procedures. • Region-specific **terms of service** and **privacy policies**.

Team Reflection

Working collaboratively on this assignment offered several advantages, including the effective division of tasks, the opportunity to generate ideas through group brainstorming, and the ability to engage in focused, goal-oriented discussions. These conversations were instrumental in clarifying the problem and determining appropriate next steps. For future projects, it may be helpful to schedule all meetings in advance and assign specific responsibilities to each group member from the beginning. This proactive approach could enhance overall efficiency and ensure smoother project execution.