

Constant Module - Detailed Sequence Diagrams

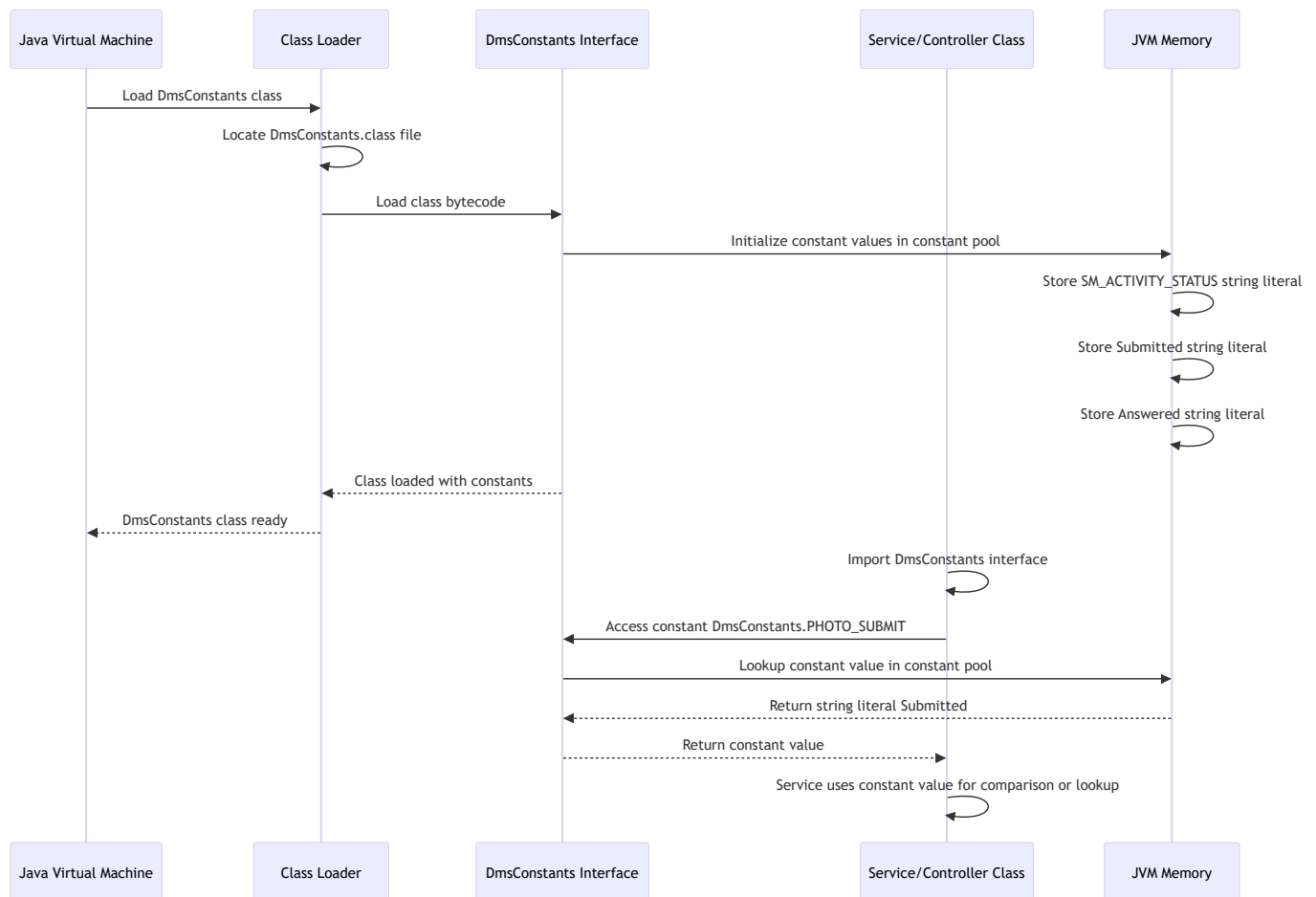
This document describes the **key technical flows** implemented in the `com.i4o.dms.kubota.constant` module:

- **Constant Definition and Loading** (DmsConstants interface with constant values).
- **Usage in Warranty Hotline Report Service** (Status constants for photo submission and answering).
- **Usage in Marketing Activity Status Controller** (Lookup type code constant for system lookups).
- **Constant Access Pattern** (How constants are accessed across the application).

All diagrams use Mermaid sequence diagrams and reflect the current implementation of the constant module.

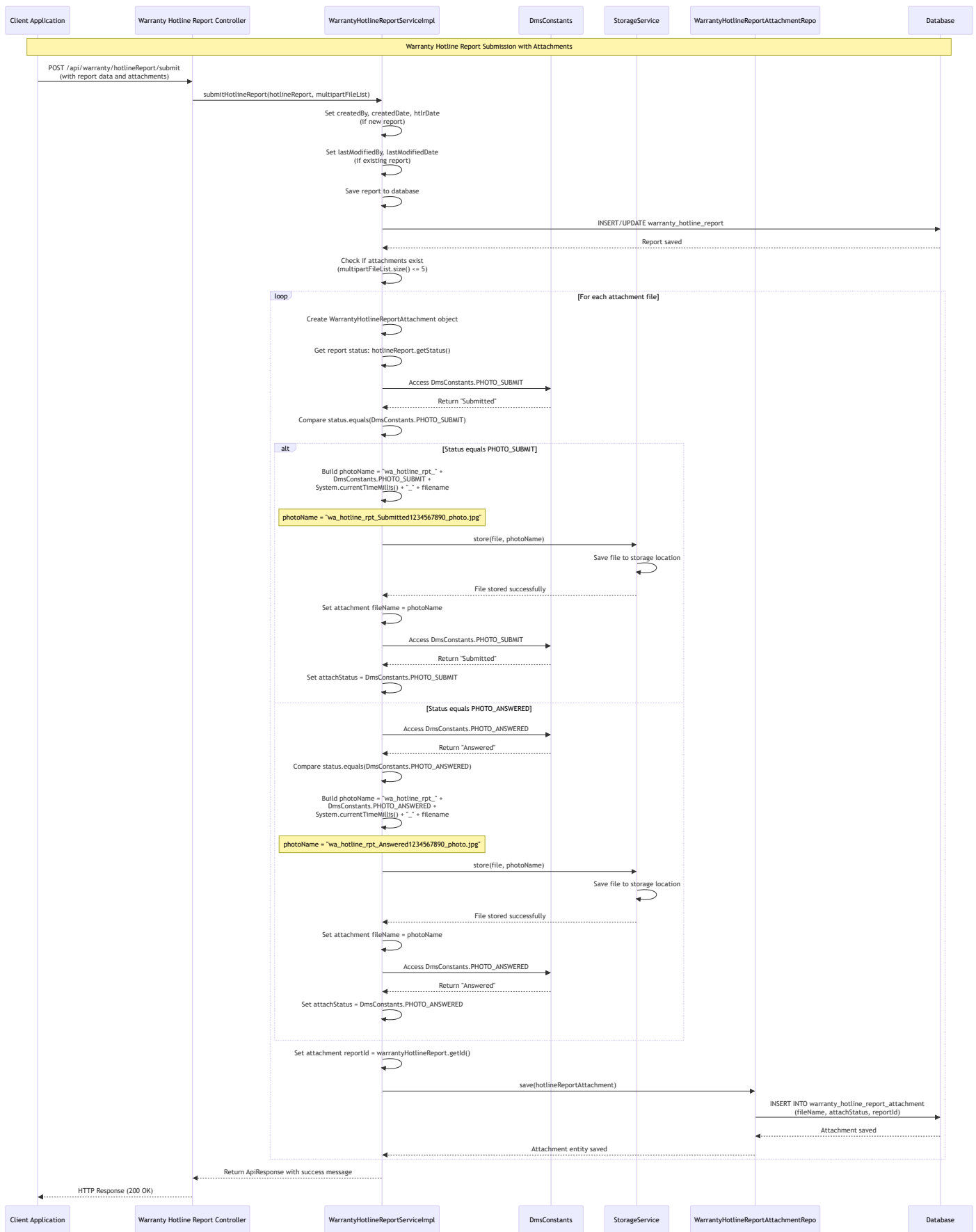
1. Constant Definition and Loading - DmsConstants Interface

This flow shows how **DmsConstants** interface defines constant values and how they are loaded and accessed by classes at compile-time and runtime.



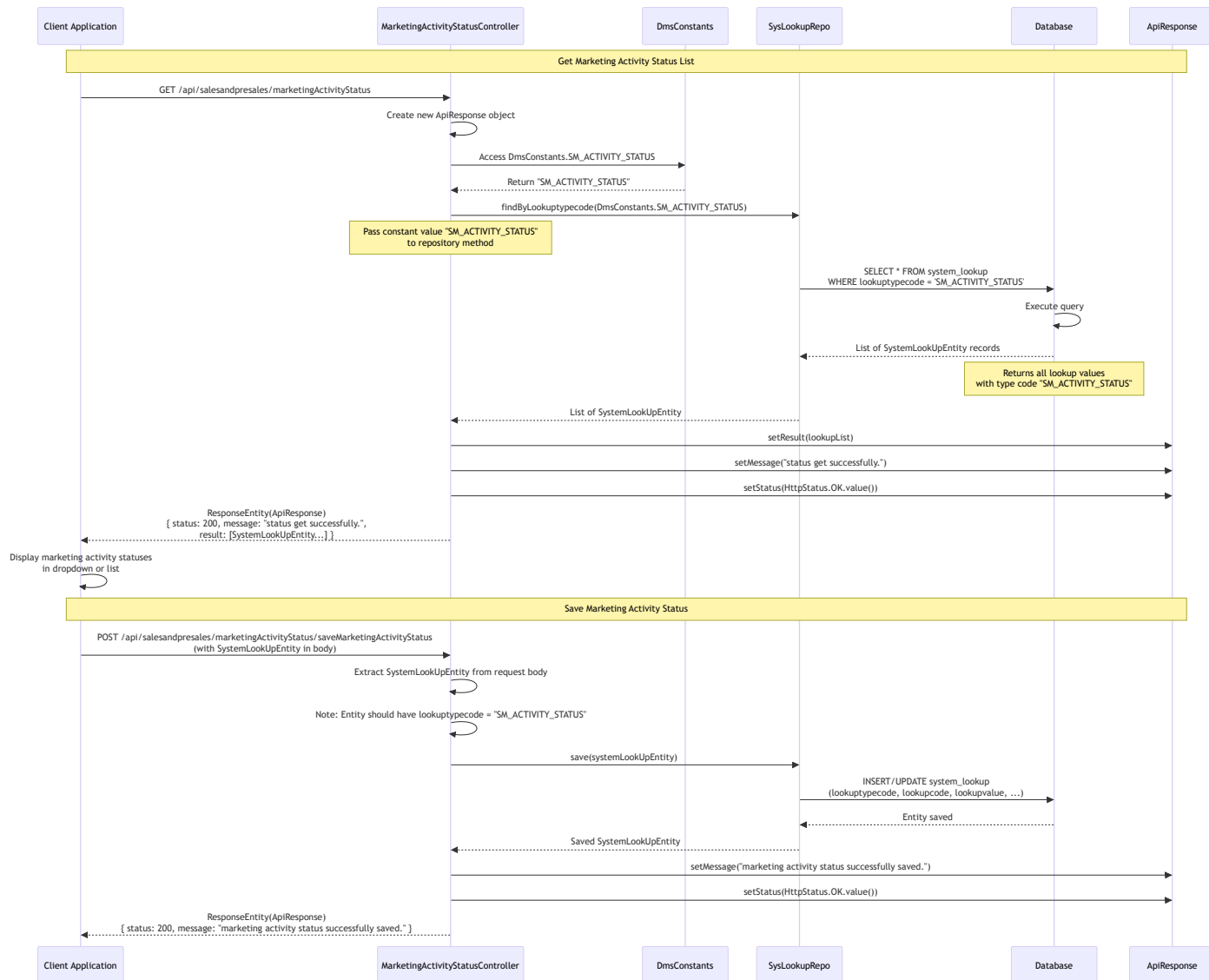
2. Usage in Warranty Hotline Report Service - Photo Status Constants

This flow shows how **DmsConstants** constants are used in **WarrantyHotlineReportServiceImpl** to determine photo attachment status when submitting warranty hotline reports.



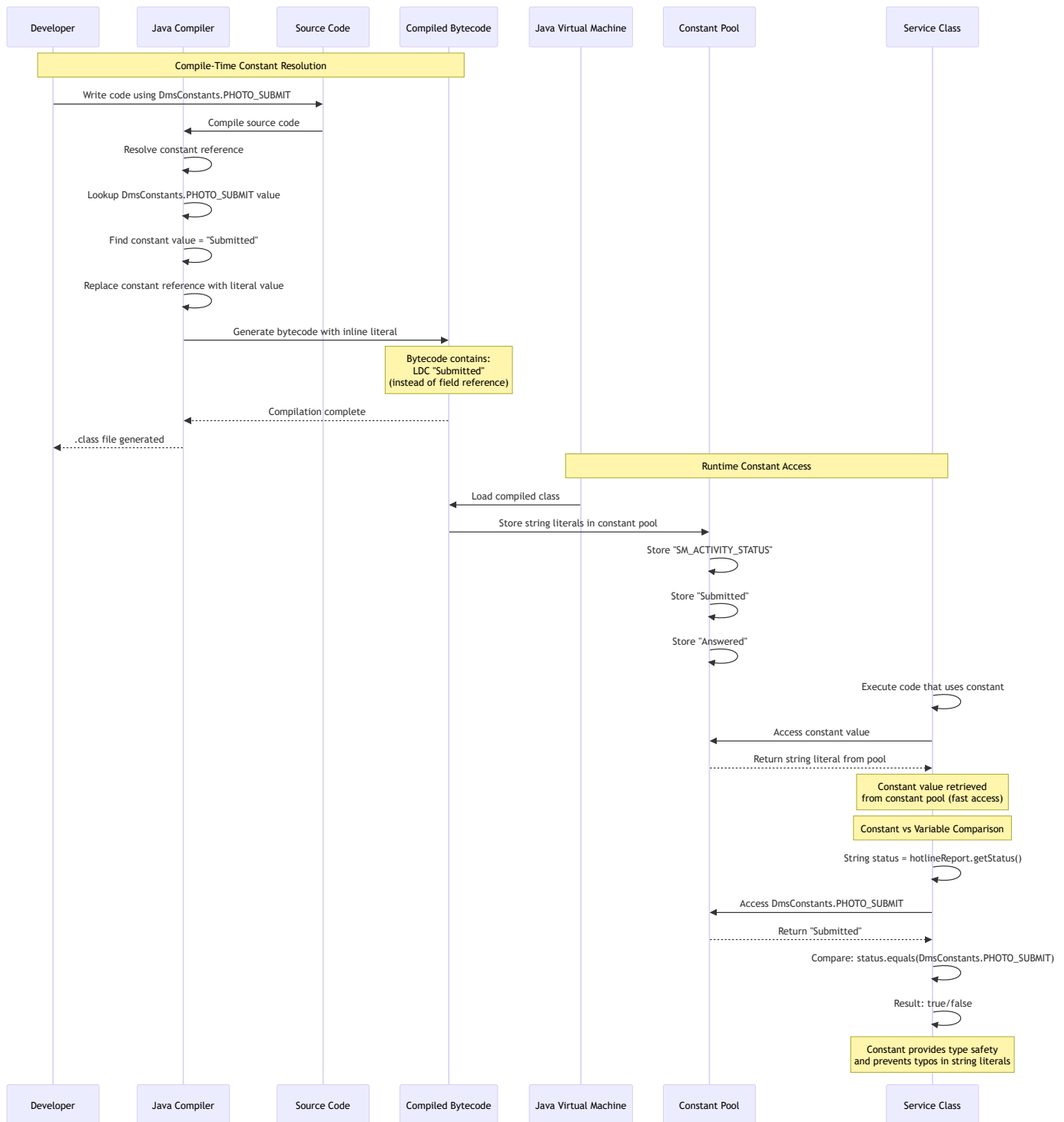
3. Usage in Marketing Activity Status Controller - System Lookup Constant

This flow shows how **DmsConstants.SM_ACTIVITY_STATUS** is used in **MarketingActivityStatusController** to query system lookup values for marketing activity statuses.



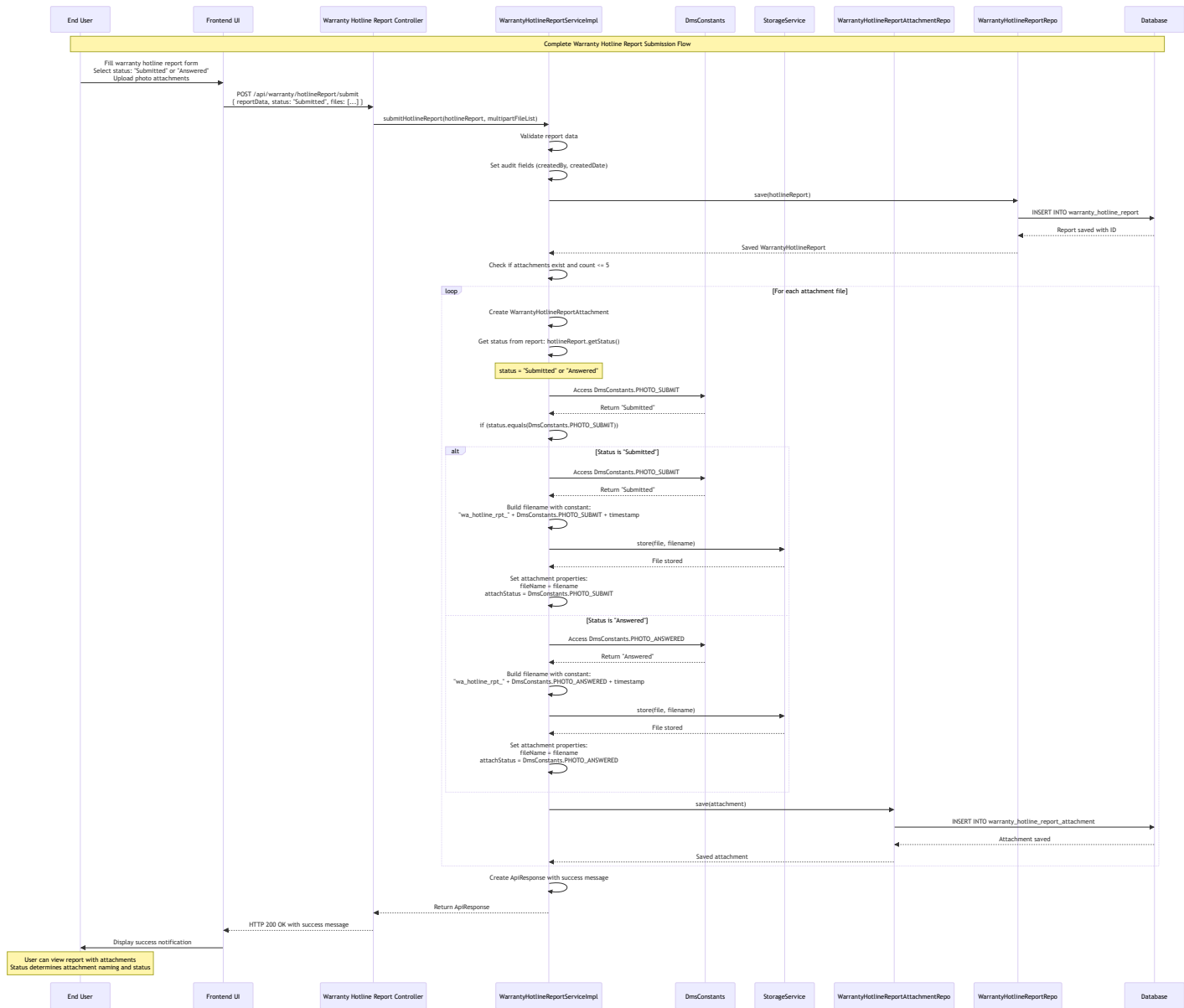
4. Constant Access Pattern - Compile-Time vs Runtime Access

This flow shows the **different patterns** of accessing constants and how they behave at compile-time vs runtime.



5. Complete Flow - Warranty Hotline Report with Constant-Based Status Management

This flow shows the **complete end-to-end flow** of how constants are used throughout the warranty hotline report submission and status management process.



Summary

The **constant** module provides **centralized constant definitions** for the KUBOTA DMS:

- **DmsConstants Interface:**
 - Defines constant string values used across the application
 - SM_ACTIVITY_STATUS : Lookup type code for marketing activity statuses
 - PHOTO_SUBMIT : Status value for submitted photos ("Submitted")
 - PHOTO_ANSWERED : Status value for answered photos ("Answered")
- **Usage Patterns:**

- **Status Comparison:** Used in `WarrantyHotlineReportServiceImpl` to determine photo attachment status and file naming
- **System Lookup:** Used in `MarketingActivityStatusController` to query system lookup values by type code
- **Type Safety:** Provides compile-time constant resolution and prevents typos in string literals
- **Benefits:**
 - **Centralized Management:** All constants defined in one place for easy maintenance
 - **Type Safety:** Compile-time checking prevents errors
 - **Performance:** Constants are stored in JVM constant pool for fast access
 - **Maintainability:** Changes to constant values only need to be made in one location
- **Constant Access:**
 - Constants are resolved at compile-time and stored in JVM constant pool
 - Access is fast and efficient (no field lookup overhead)
 - Values are inlined in bytecode for optimal performance

This module ensures **consistent use of string constants** across the application, reducing errors from typos and making it easier to maintain and update constant values throughout the codebase.