# Automating HDM

## HDM Continuous Improvements Through Automation

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## *Executive Summary*

Solventum, formerly 3M Healthcare, is a global leader in healthcare and software development with an annual profit of $8.67 billion. One of its flagship products, the Health Data Management (HDM) System, generates $30 million annually and serves as a critical tool for Health Information Managers. Faced with testing bottlenecks, fragmented data, and skepticism about automation, Solventum's HDM team—guided by Scrum coaches Joe Justice and Nigel Thurgood—transformed its development and QA processes.. The result: 252 days of testing saved, $600,000 in cost reductions, 100,000+ test records generated in minutes, and 75% automation coverage of a 2,000-case test suite.

## *Background*

**Industry**: Healthcare & Software Development
**Organization**: Solventum (formerly 3M Healthcare)
**Product**: Health Data Management (HDM) Tool
**Annual Product Revenue**: $30 Million
**Scrum Coaches**: Joe Justice & Nigel Thurgood
**Scrum Training Provided By**: Scrum Inc.

The HDM System is designed to streamline workflows for Health Information Managers, offering:

- Automated data collection and reporting
- Real-time demographic imports
- HL7 and proprietary data transfer formats
- Customizable reporting
- Role-based security
- Integration with compliance, quality, and utilization systems

## *3MHIS/Solventum Had to Change to Meet Market Demands*

3M HIS now Solventum recognized the limitations of the traditional waterfall development model, which often led to rigid timelines, delayed feedback, and reduced adaptability. Transitioning to the Scrum framework enabled the teams to embrace a culture of continuous improvement, iterative delivery, and enhanced collaboration. This shift not only streamlined development cycles but also empowered the teams to respond more effectively to changing requirements and stakeholder feedback.

## *Challenges with HDM Waterfall Methodology:*

### Manual Test Data Creation

- Engineers, Product Analysts, and QA Analysts manually created test data for unit, regression, and smoke testing.

- Each medical record could require over 100 unique inputs.
- No shared database: each team member built their own data sets.

### Manual QA Testing

- Over 2,000 manual test cases for stress, regression, and smoke testing.
- Testing cycles took up to 2 months under waterfall methodology.
- QA team included 2 onsite analysts and 3 offshore analysts in India.

### Team Resistance to Automation

- The team believed HDM was too complex to automate.
- Automation efforts were initially dismissed as infeasible.

## *Solution-*

### - Automating Patient Data Creation

**Led by**: Brandon Adams (Scrum Master) Key Contributor: Daniel Hudson (Product Analyst)

- Initial Kaizen events focused on automating patient record creation.
- Brandon Adams built an AutoIt script that created 20 to 30 records in 45 minutes.
- Daniel Hudson improved the process by creating HDM Patient Generator Tool, an executable that generates up to 100,000+ patient records in minutes.
- Records are imported using the Load Data Tool, enabling rapid database population and cleanup.

**Impact**:

- Test data creation reduced from hours or even days to minutes.
- Centralized, scalable test database ranging from 500 to 100,000 records.

### - Automating QA Test Suite

Led by: Brandon Adams & Daniel Hudson

- Evaluated multiple tools: Visual Studio Test Suite, AutoIt, and Ranorex.
- Ranorex was selected for its intuitive interface and compatibility with legacy C++ and Delphi codebases.
- Automated 75% of the 2,000-case test suite.
- Full regression testing is now completed in 1 week using 1 QA Engineer.

**Impact**:

- QA team reduced from 5 to 1.
- Testing cycle time is cut by over 80%.
- Significant cost savings and improved product reliability.

### -Shifting Team Mindset

- Scrum framework and Kaizen events fostered continuous improvement.
- Automation success stories led by Brandon Adams and Daniel Hudson changed team perception.

- HDM is now viewed as a scalable, automatable product.

**Impact**:

- Over 252 days of testing were saved in 2024.
- $600,000 dollars saved in 2024 from automation.
- Health Data Management team now embraces automation as essential to success.

## Results Summary

| Metric | Before | After |
|---|---|---|
| Time to Create 10 patient records | 2 to 3 hours Manual | Minutes (HDM Generator) |
| QA Testing Cycle | Up to 2 Months | 1 Week |
| QA Team Size | 5 Analyst | 1 Engineer |
| Test Data Volume | <500 Records | Up to 100,000+ Records |
| Automation Coverage | 0% Test Suite Coverage | 75% of Test Suite Coverage |
| Team Perception | “Impossible to Automate” | “Essential to Success” |

## Lessons Learned

- Scrum and continuous improvement unlock innovation in legacy environments.
- Empowered individuals can catalyze large-scale change.
- Automation is achievable even in complex, regulated healthcare systems.
- Cultural mindset shifts are as critical as technical solutions.