

Efficient Temperature Report Generation Using An Application Programming Interface

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1. Background

Investigational Drug Services (IDS) at the University of Illinois Hospital and Health Sciences System (UI Health) uses a 24/7 continuous electronic system and a manual process to monitor storage temperature. The latter necessitates daily temperature recording on paper for 11 individual storage areas that house IP from approximately 160 oncology and non-oncology studies. Monthly report archiving required scanning these paper records, saving them on a shared network drive, renaming files, and storing physical copies in binders after hole-punching. This process was time-intensive and diverted IDS staff from other essential operations.

2. Goals

The primary objective was to streamline the temperature monitoring process to improve efficiency, accuracy, and resource allocation. This was achieved through direct data entry in a secure web application, automate data extraction, generate reports, reduce manual processes, minimize errors, and expedite pharmacist review and approval of monthly reports.

3. Solutions and Methods

This project integrated REDCap with RStudio via an Application Programming Interface (API) which enables seamless transfer of data from REDCap into RStudio for automated processing.

The system extracts daily temperature records and generates detailed monthly reports. Using the API, the system creates temperature tables with data points such as date, time, minimum, maximum, and current temperatures, along with the identity of the data collector and relevant comments.

To enhance data review and dissemination, a ShinyApp was developed. The app provides an interactive dashboard that allows real-time monitoring and proactive management of temperature-sensitive storage areas.

4. Outcomes

The traditional paper-based method took approximately 10 minutes to process and archive all necessary reports, the REDCap method averaged 8 minutes, while the API approach completed the task in about 1 minute. This time reduction is particularly meaningful during busy operations, where time intensive processes could negatively impact IDS workflow and compliance timelines.

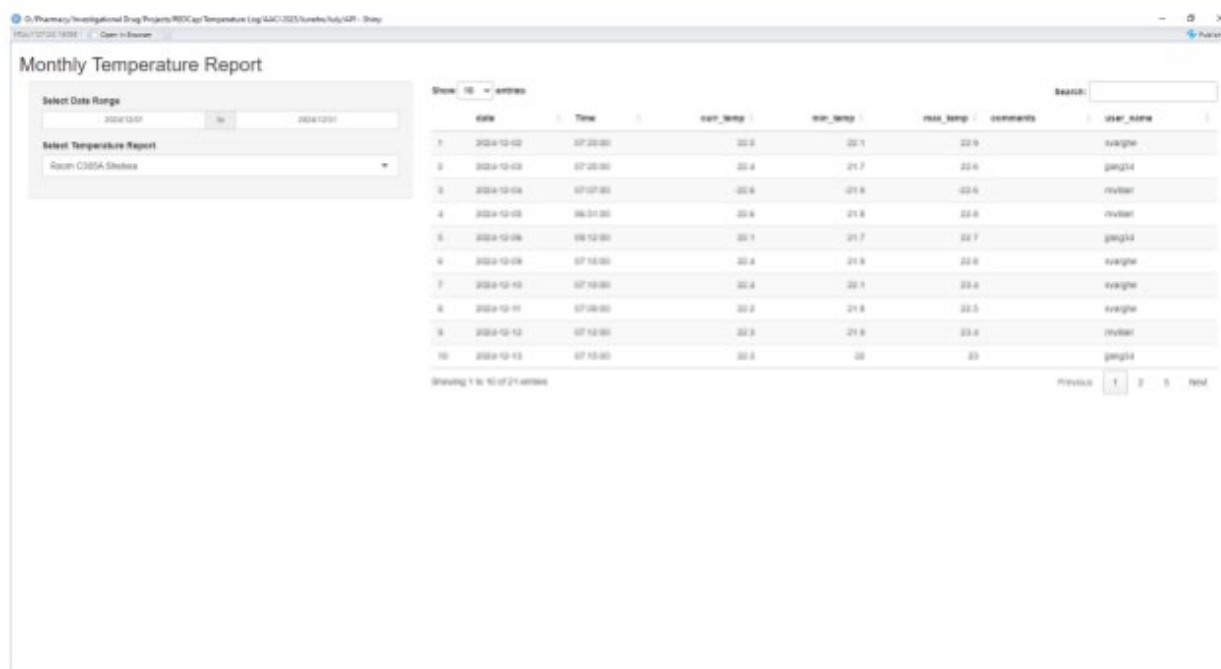
Unlike the REDCap method, which required running individual reports for each location, the API approach generated all reports for all 11 storage areas simultaneously. This facile process reduced staff workload, allowing IDS staff to focus on critical tasks. The automated system's ability to create detailed temperature tables and consolidate data into a single, organized PDF improved the review process. The ShinyApp further enhanced data accessibility and usability, supporting proactive management of storage areas as it eliminates the need to log into REDCap, enabling public access while maintaining security and compliance. These improvements led to a streamlined workflow, strengthened regulatory compliance, and boosted overall efficiency within IDS.

Category: Clinical Trial Operations (Trial Start-up, Regulatory, Data Management, IITs) – Completed Project

5. Lessons Learned and Future Directions

Automating data reporting significantly improved IDS operational efficiency. The ShinyApp integration offered advanced visualization tools and customizable reporting features, meeting IDS staff needs. Future directions include expanding API integration to other IDS tasks and potentially across departments. Ongoing monitoring and iterative enhancements will optimize the process and sustain long-term benefits.

Figure



Monthly Temperature Report

Select Date Range: 2024-12-01 to 2024-12-01

Select Temperature Report: Room C305A Shelves

Show: 10 entries

	date	Time	min_temp	max_temp	min_temp	max_temp	comments	user_name
1	2024-12-02	07:25:00	22.5	22.1	22.5			nvaighe
2	2024-12-02	07:25:00	22.4	21.7	22.4			gungia
3	2024-12-04	07:07:00	22.5	21.8	22.5			nvaighe
4	2024-12-05	06:31:00	22.4	21.8	22.4			nvaighe
5	2024-12-06	06:12:00	22.1	21.7	22.7			gungia
6	2024-12-08	07:15:00	22.4	21.9	22.6			nvaighe
7	2024-12-10	07:19:00	22.4	22.1	22.6			nvaighe
8	2024-12-11	07:09:00	22.2	21.9	22.5			nvaighe
9	2024-12-12	07:19:00	22.2	21.9	22.5			nvaighe
10	2024-12-13	07:13:00	22.2	22	22			gungia

Showing 1 to 10 of 21 entries

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