

AUTOMATED PTO WORKFLOW SYSTEM

TECHNICAL SYSTEM SPECIFICATION

Structured behavior blueprint, implementation mapping, and acceptance criteria

Version	1.0
Effective date	July 13, 2026
Author and system designer	Tomas L. Baca
Deployment scope	Local operations - 17 eligible employees
Platform	Google Forms, Google Sheets, Google Apps Script, Gmail, Google Calendar
Classification	Portfolio Edition - public-safe technical documentation

Purpose: Define the implemented system in unambiguous, actionable, and testable terms. This specification reverse-engineers the production workflow from source code, workbook formulas, configuration evidence, screenshots, and validated operating behavior.

1. Document Control

Field	Value
Document title	Automated PTO Workflow System - Technical System Specification
Version	1.0
Effective date	2026-07-13
Document owner	System owner / designer
Specification basis	Production source code, workbook formulas, configuration evidence, screenshots, and owner-validated behavior
Primary purpose	Define system behavior, implementation logic, and testable acceptance criteria
Confidentiality	Public-safe; private email addresses, internal URLs, Calendar IDs, and company identifiers are omitted

1.1 Versioning Convention

[Location] PTO System Specification v[Major.Minor] - YYYY-MM-DD

- A separate dated version is saved whenever a material system change is documented.
- Minor revisions improve the existing Google Form / Sheets / Apps Script / Calendar architecture without replacing a core platform or operating model.
- Major revisions replace a core interface or platform, materially redesign the data or approval model, or expand the system to additional locations.
- Prior versions are retained as an implementation history and requirements baseline.

1.2 Revision History

Version	Date	Change summary	Author
1.0	2026-07-13	Initial portfolio technical specification reverse-engineered from the production implementation.	Tomas L. Baca

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2. System Overview

2.1 System Purpose

The Automated PTO Workflow System centralizes employee time-off request intake, evaluates local staffing-coverage conditions, routes manager decisions, records request status, synchronizes approved absences to a shared Calendar, and provides management visibility through structured dashboard reporting and scheduled sick-time alerts.

2.2 Business Objectives

- Replace fragmented request handling with one structured, repeatable workflow.
- Provide managers, supervisors, and dispatch personnel with timely request and decision visibility.
- Apply consistent local Vacation coverage evaluation using employee job-title groups.
- Convert manager email decisions into workbook status updates and Calendar events.
- Provide per-employee request totals and visible sick-time thresholds.
- Preserve system knowledge in a version-controlled specification that connects business requirements to implemented behavior.

2.3 Current Deployment Scope

Scope item	Implemented state
Operational location	One local office
Eligible users	17 employees: 10 Groundsmen, 5 Journeymen, and 2 Patrol employees
Workflow coverage	100% of PTO request tracking for the eligible local employee population
Production platform	Google Workspace
Time zone	(GMT-06:00) Mountain Time - Denver for the workbook, Apps Script project, and Calendar
Core services	Google Forms, Google Sheets, Google Apps Script, email delivery, Google Calendar

2.4 Operational Validation Summary

Validation signal	Observed result
Eligible employee users	17
Requests processed	162 over approximately 5.5 months
Automated workflow emails	Approximately 486
Operational adoption	Production use for all eligible employee PTO requests
Automated outcomes	Request routing, coverage warnings, decision recording, Calendar synchronization, notifications, dashboard totals, and threshold alerts

3. Architecture and Component Inventory

Automated PTO Workflow System - Component Architecture

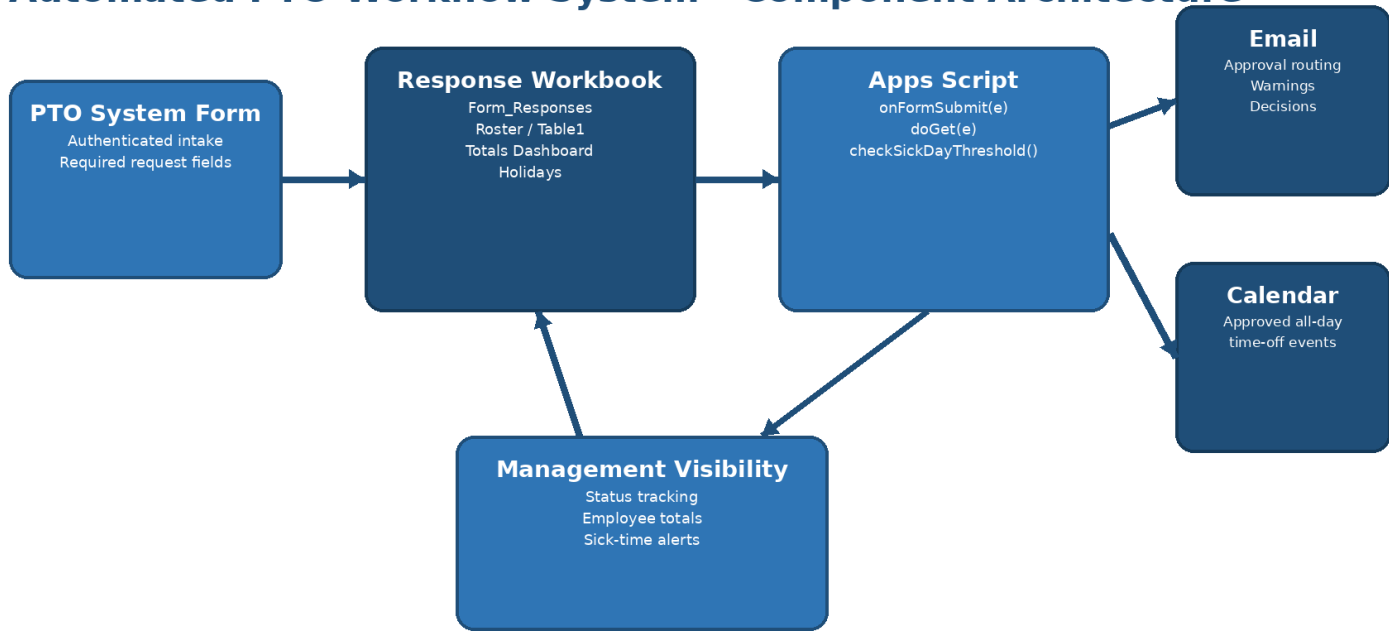


Figure 1. Production component architecture

3.1 Production Components

Component	Exact production name	Primary behavior
Google Form	PTO System Form	Authenticated employee request intake and required field validation.
Response workbook	PTO System Form (Responses)	Stores request records, roster classification, calculations, dashboard totals, and holiday dates.
Apps Script project	PTO System	Executes submission processing, coverage evaluation, manager decision routing, Calendar synchronization, notifications, and threshold monitoring.
Shared Calendar	Employee Time Off	Displays approved time-off events as shared all-day events.
Shared Drive folder	Time Off Request Files	Stores the Form, response workbook, technical specification, and associated documentation.

3.2 High-Level Data Flow

Step	System behavior
1	Employee submits PTO System Form using a company-authenticated account.
2	Google Forms writes the response to Form Responses 1 in the response workbook.
3	The installable submission trigger runs the production Apps Script workflow.
4	Vacation requests are evaluated against approved same-title overlaps.
5	Configured manager recipients receive request details and decision links.
6	The Director of Operations activates the approval or rejection action.
7	The web app writes the decision to the request record.
8	Approved requests create an all-day event on Employee Time Off.
9	The employee and configured supervisory recipients receive the decision.
10	Dashboard formulas and the scheduled threshold monitor provide ongoing management visibility.

4. Actors and System Roles

Actor / role	System interaction	Decision authority
Employee requester	Submits a PTO request through the authenticated Form and receives workflow notifications.	Provides request information.
Director of Operations	Reviews request details and uses the approval or rejection action.	Sole operational decision authority.
Operations Supervisor	Receives request and decision visibility.	Awareness and operational coordination.
Dispatch / supervisory recipients	Receive request and decision communications and use Calendar visibility for scheduling.	Operational awareness.
System owner / designer	Builds, configures, deploys, documents, monitors, and maintains the workflow.	Technical configuration and change authority.
Google Workspace services	Execute Forms, Sheets, Apps Script, email, and Calendar operations.	Automated service behavior.

5. Data Model

5.1 Workbook Inventory

Sheet	Named table	System purpose
Form Responses 1	Form_Responses	Primary request record and workflow-state table.
Roster	Table1	Employee email-to-job-title lookup used by coverage evaluation.
Totals Dashboard	-	Per-employee totals, visual thresholds, and sick-alert memory.
Holidays	Holidays	Company-designated paid non-working dates used in business-day calculations.

5.2 Form_Responses Schema

Column	Field	Source / update behavior	System use
A	Timestamp	Written by Google Forms at submission.	Submission record and chronology.
B	Employee Email	Required Form selection.	Employee identifier and roster lookup key.
C	First Day	Required Form date.	Inclusive request start date.
D	Last Day	Required Form date.	Inclusive request end date.
E	Type of Time Off Needed	Required Form option.	Request classification and dashboard category.
F	Reason	Required free-text field.	Manager request context.
G	Status	Written by the decision web app.	Decision state: Approved or Rejected; blank until decision.
H	Days Total	Calculated by the workbook table formula.	Business-day total used by reporting.
I	Event Created	Written after successful Calendar synchronization.	Calendar creation confirmation.

5.3 Roster / Table1 Schema

Column	Field	Behavior
A	Employee Email	Exact employee identifier used to match the submitted Form value.
B	Job Title	Exact classification value used by Vacation overlap logic.

Exact job title	Current employees	Coverage behavior
Groundsman	10	Two-person Vacation coverage warning applies.
Journeyman	5	Two-person Vacation coverage warning applies.
Patrol	2	Requests are reviewed by the DOO according to city and customer coverage needs.

5.4 Totals Dashboard Schema

Column	Field	Behavior
A	Employee Email	Maintained employee identifier.
B	First Name	Derived from the email naming convention.
C	Last Name	Derived from the email naming convention.
D	Sick	SUMIFS-based request-day total; source for threshold monitoring.
E	Vacation	SUMIFS-based request-day total.
F	Training / Certification	SUMIFS-based request-day total.
G	Parental Leave	SUMIFS-based request-day total.
H	Bereavement	SUMIFS-based request-day total.
I	Jury Duty	SUMIFS-based request-day total.
J	Late Start or Leave Early	SUMIFS-based request-day total.
K	Visual spacer	Separates request totals from alert memory.
L	Last Sick Total Notified	Stores the last threshold value used by the scheduled alert process.

5.5 Holidays Schema

Table	Column	Behavior
Holidays	Holidays	Contains the official company-designated paid non-working dates used by NETWORKDAYS calculations.

6. Functional Requirements

Requirement statements use “shall” to define expected implemented behavior. Requirement identifiers are mapped to components and acceptance criteria in Section 13.

6.1 Request Intake Requirements

FR-001 - Authenticated Access

The system shall require a company-authenticated Google account before the PTO request Form can be accessed.

FR-002 - Required Employee Identity

The system shall require selection of an employee email value from the configured employee list.

FR-003 - Required Date Range

The system shall require a First Day and Last Day for every request.

FR-004 - Required Request Type

The system shall require one of the seven configured time-off categories.

FR-005 - Required Request Context

The system shall require a Reason value for every request.

FR-006 - Response Confirmation

The system shall display “Your response has been recorded” after successful submission.

6.2 Record Creation and Classification Requirements

FR-007 - Response Storage

The system shall write each valid submission to the Form_Responses table in the response workbook.

FR-008 - Employee Lookup

The submission workflow shall use Employee Email as the lookup key for Table1.

FR-009 - Job-Title Retrieval

The submission workflow shall retrieve the exact roster job title associated with the submitted employee email.

FR-010 - Business-Day Calculation

The workbook shall calculate Days Total using the submitted date range and the Holidays table.

FR-011 - Request Category Preservation

The workbook shall preserve the exact Form request type for reporting and notifications.

FR-012 - Pending State

A submitted request shall remain in a blank Status state until a manager decision is processed.

6.3 Vacation Coverage Requirements

FR-013 - Vacation-Only Evaluation

The overlap workflow shall run only when the submitted request type is Vacation.

FR-014 - Same-Title Comparison

The overlap workflow shall compare the request only with employees assigned the same exact Table1 job title.

FR-015 - Approved-Record Comparison

The overlap workflow shall count only existing records with Status equal to Approved.

FR-016 - Requester Exclusion

The overlap workflow shall exclude existing records belonging to the requesting employee.

FR-017 - Inclusive Overlap

The overlap workflow shall treat the submitted First Day and Last Day as inclusive date boundaries.

FR-018 - Coverage Warning

The system shall generate a Vacation coverage warning when two or more approved same-title employee records overlap the requested date range.

FR-019 - Advisory Decision Support

A coverage warning shall inform the decision workflow without preventing the Director of Operations from selecting Approved or Rejected.

6.4 Decision Workflow Requirements

FR-020 - Manager Decision Message

The system shall send configured manager recipients the employee, request type, date range, Reason, and actionable approval and rejection links.

FR-021 - Decision Parameters

Each action link shall identify the target request row and requested action.

FR-022 - Approval State Update

When the authorized manager activates Approve, the web app shall write Approved to the request Status field.

FR-023 - Rejection State Update

When the authorized manager activates Reject, the web app shall write Rejected to the request Status field.

FR-024 - Decision Confirmation Page

The web app shall return an HTML confirmation page after processing the selected decision.

6.5 Calendar and Notification Requirements

FR-025 - Approved Calendar Event

An Approved request shall create an all-day event on Employee Time Off.

FR-026 - Inclusive Calendar Span

The Calendar event shall include every submitted calendar date by using the submitted Last Day plus one day as the event end boundary required by Google Calendar.

FR-027 - Calendar Event Title

The event title shall use the employee first name followed by the request type.

FR-028 - Calendar Event Description

The event description shall include employee first name, request type, and submitted date range.

FR-029 - Calendar Confirmation Field

After Calendar creation, the system shall write Event Created to Column I of the request row.

FR-030 - Employee Decision Notification

The system shall notify the requesting employee after an Approved or Rejected decision.

FR-031 - Supervisory Decision Visibility

The system shall copy configured supervisory recipients on the employee decision notification.

6.6 Dashboard and Threshold Requirements

FR-032 - Employee Category Totals

The Totals Dashboard shall aggregate Days Total by employee email and request type across Columns D through J.

FR-033 - Name Derivation

The dashboard shall derive employee first and last names from the configured email naming convention.

FR-034 - Visual Usage States

The dashboard shall apply conditional formatting to communicate increasing request-day totals.

FR-035 - Scheduled Sick Scan

The system shall run checkSickDayThreshold() on a four-hour time-driven schedule.

FR-036 - Sick Threshold Alert

The system shall send a configured management alert when an employee Sick total reaches or exceeds 10 and exceeds the last notified value.

FR-037 - Alert Memory Update

After sending a sick-threshold alert, the system shall write the current Sick total to Last Sick Total Notified.

FR-038 - Alert De-duplication

The system shall not send another sick-threshold alert while the current Sick total is unchanged from the last notified value.

7. Business Rules

ID	Rule	Testable behavior
BR-001	Sick-time reference	The Form shall display the local guideline of 80 hours per year.
BR-002	Groundsman Vacation coverage	A Vacation request shall generate a warning when two approved Groundsman records already overlap the requested dates.
BR-003	Journeyman Vacation coverage	A Vacation request shall generate a warning when two approved Journeyman records already overlap the requested dates.
BR-004	Patrol coverage	Patrol requests shall be reviewed by the Director of Operations according to the applicable city and customer coverage needs.
BR-005	December Vacation guidance	The Form shall display the local guideline that Vacation PTO is not approved in December.
BR-006	Approval authority	A request shall not be operationally approved until the Director of Operations processes the manager decision.
BR-007	Date inclusion	First Day and Last Day are inclusive for overlap analysis.
BR-008	Business-day total	Days Total shall count weekdays and exclude dates listed in Holidays.
BR-009	Same-day request	A one-day request shall use the same value for First Day and Last Day.
BR-010	Conflict warning audience	The requesting employee shall receive the warning, with configured managers copied.
BR-011	Sick visual warning	Sick totals from 5 through 9 shall display bold red text on a light-gray fill.
BR-012	Sick highest warning	Sick totals greater than 9 shall display a red fill with bold, underlined white text.
BR-013	General usage visualization	Request-category totals from 1 through 4 in D2:J30 shall display a light-gray fill.
BR-014	Shared Calendar visibility	Approved time off shall be visible through the shared Employee Time Off Calendar.
BR-015	Time-zone consistency	The spreadsheet, Apps Script project, and Calendar shall use Mountain Time - Denver.

8. Component Specifications

8.1 PTO System Form

Field / element	Configuration	Behavior
Header and instructions	Static content	Displays local PTO rules, approval notice, and year-specific visual identity.
Employee Email	Required selection	Identifies the employee and provides the roster lookup key.
First Day	Required date	Defines the inclusive request start date.
Last Day	Required date	Defines the inclusive request end date.
Type of Time Off Needed	Required selection	Defines the request category.
Reason	Required text	Provides request context and may include start/end timing details when relevant.
Confirmation	Static response	Displays “Your response has been recorded.”

8.2 Configured Request Types

#	Exact option
1	Vacation
2	Sick - Call In
3	Late Start or Leave Early
4	Training / Certification
5	Bereavement
6	Jury Duty
7	Parental Leave

8.3 PTO System Form (Responses)

The response workbook is the system of record for request rows, roster classification, business-day totals, dashboard reporting, and holiday exclusions. Form_Responses and Table1 provide structured references, while Totals Dashboard provides management-facing aggregation and visual states.

8.4 PTO System Apps Script

Function	Execution method	Specification responsibility
onFormSubmit(e)	Installable spreadsheet trigger - On form submit	Read the new record, evaluate Vacation coverage, generate employee warning when required, and send the manager decision message.
doGet(e)	Deployed web-app HTTP GET	Process Approve or Reject action, update Status, create approved Calendar event, write Event Created, notify employee and supervisory recipients, and return confirmation HTML.
checkSickDayThreshold()	Time-driven trigger - every 4 hours	Read dashboard Sick totals, compare each value with the threshold and last notified value, send qualifying alerts, and update alert memory.

8.5 Employee Time Off Calendar

Property	Specification
Calendar name	Employee Time Off
Event type	All-day event
Event title	[Employee first name] - [Request type]
Event description	Employee first name, request type, and submitted date range
Event start	Submitted First Day
Event end boundary	Submitted Last Day plus one day
Creation trigger	Approved decision processed by doGet(e)
Visibility purpose	Shared staffing, dispatch, and employee awareness

9. Automated Workflow Specifications

Primary Automated Workflow

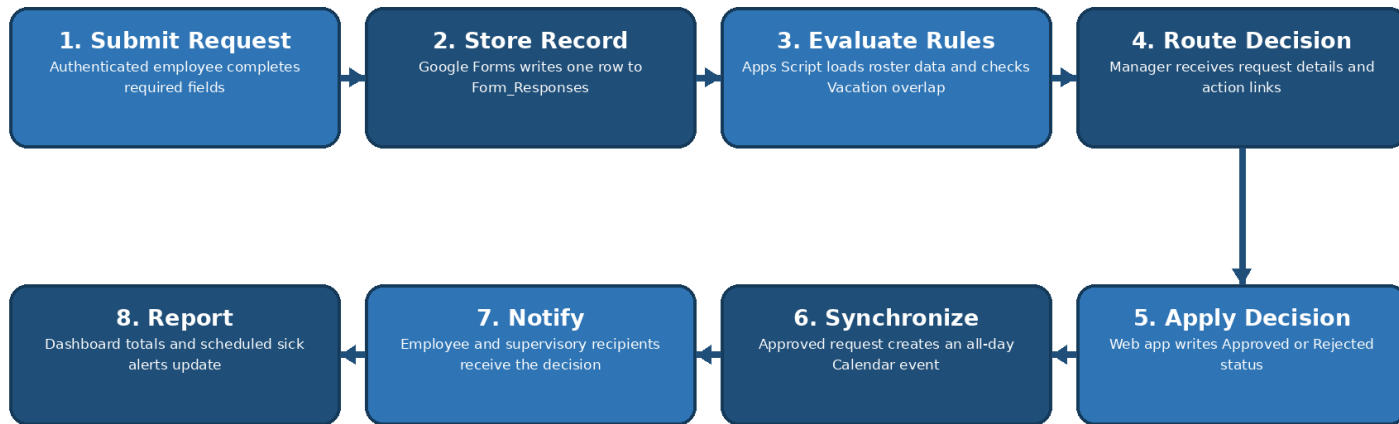


Figure 2. Primary automated request workflow

9.1 Request Submission Workflow

Step	Input / condition	System action	Output
1	Authenticated employee opens the Form.	Display required fields and local rules.	Request-entry interface.
2	Employee completes all required fields.	Google Forms validates required inputs.	Submission accepted.
3	Submission accepted.	Write one new response row to Form_Responses.	Timestamped request record.
4	New response row created.	Invoke onFormSubmit(e).	Automated processing begins.

9.2 Vacation Coverage Workflow

Step	Processing behavior
1	Confirm that request type equals Vacation.
2	Use Employee Email to retrieve the requester job title from Table1.
3	Scan existing Form_Responses rows with Status equal to Approved.

Step	Processing behavior
4	Exclude records belonging to the requester.
5	Compare only records with the same exact job title.
6	Apply inclusive overlap logic to First Day and Last Day.
7	When two or more records overlap, send the employee a coverage warning and include the warning in the manager decision message.
8	Continue to the manager decision workflow.

9.3 Manager Decision Workflow

Decision	System behavior
Approve	Write Approved to Status, create the all-day Calendar event, write Event Created, notify the employee and supervisory recipients, and display the confirmation page.
Reject	Write Rejected to Status, notify the employee and supervisory recipients, and display the confirmation page.

9.4 Sick-Time Threshold Workflow

Step	System behavior
1	The four-hour trigger invokes checkSickDayThreshold().
2	Read Totals Dashboard employee rows and the Sick total in Column D.
3	Read Last Sick Total Notified in Column L.
4	Qualify the record when Sick is 10 or greater and greater than the last notified value.
5	Send the configured management alert containing the employee and current total.
6	Write the current Sick total to Column L.
7	Skip notification when the total has not increased beyond the stored value.

10. Formula and Logic Specifications

10.1 Days Total

=NETWORKDAYS(C[row], D[row], Holidays[Holidays])

The Form_Responses table applies the formula to new request rows. The result includes both submitted boundary dates when they are weekdays and excludes weekends and company-designated dates in the Holidays table.

10.2 Employee Name Derivation

=PROPER(LEFT(A2, FIND(".", A2) - 1))

=PROPER(REGEXEXTRACT(A2, "\.([a-zA-Z]+)@"))

The dashboard derives display names from the configured firstname.lastname email convention.

10.3 Category Total Pattern

=SUMIFS('Form Responses 1'!H:H, 'Form Responses 1'!B:B, A2, 'Form Responses 1'!E:E, "Sick*")

Columns D through J use the same pattern with the corresponding request-type criterion.

10.4 Inclusive Overlap Logic

overlap = existingFirstDay <= requestedLastDay AND existingLastDay >= requestedFirstDay

The comparison counts any shared calendar date between an approved same-title record and the submitted Vacation request.

10.5 Calendar End-Boundary Logic

calendarEnd = submittedLastDay + 1 day

Google Calendar all-day event end boundaries are exclusive; adding one day ensures that the submitted Last Day remains visible as part of the approved absence.

11. Interface and Notification Specifications

11.1 Manager Decision Message

- Employee identifier / first name
- Request type
- First Day and Last Day
- Reason
- Vacation coverage warning when the threshold condition is met
- Approve link
- Reject link

11.2 Employee Coverage Warning

When a Vacation request overlaps two or more approved same-title employee records, the system sends the requesting employee a warning and copies configured manager recipients. The warning provides staffing context while preserving manager decision authority.

11.3 Decision Notification

After the web app processes Approved or Rejected, the system sends the employee a decision message and copies configured supervisory recipients.

11.4 Sick-Threshold Alert

When an employee Sick total reaches or exceeds 10 and exceeds the stored last-notified value, the system sends configured management recipients an alert containing the current total and a link to the dashboard.

11.5 Dashboard Conditional Formatting

Rule	Range	Condition	Visual state
1	D2:J30	Between 1 and 4	Light-gray fill
2	D2:D30	Between 5 and 9	Light-gray fill with bold red font
3	D2:D30	Greater than 9	Red fill with bold, underlined white font

12. Acceptance Criteria

ID	Test objective	Test condition	Expected result
AC-001	Authenticated access	Open the Form without a company-authenticated session.	The Form requires company sign-in before request entry.
AC-002	Valid submission	Submit all required fields.	One new timestamped row is written to Form_Responses and the confirmation message is displayed.
AC-003	Roster classification	Submit using an email contained in Table1.	The workflow retrieves the exact configured job title.
AC-004	Same-day request	Submit the same First Day and Last Day on a weekday that is not a listed holiday.	Days Total equals 1.
AC-005	Weekend exclusion	Submit a date range that includes a Saturday and Sunday.	Days Total excludes the weekend dates.
AC-006	Holiday exclusion	Submit a date range containing a date in Holidays.	Days Total excludes the listed company date.
AC-007	Vacation below warning threshold	Submit Vacation with fewer than two approved same-title overlapping employees.	No employee coverage warning is generated; the manager decision message is sent.
AC-008	Vacation warning threshold	Submit Vacation overlapping two approved same-title employee records.	The employee warning is sent and the manager decision message contains the coverage warning.
AC-009	Approval processing	Activate Approve for a pending request.	Status becomes Approved, an all-day Calendar event is created, Event Created is written, and decision notifications are sent.
AC-010	Rejection processing	Activate Reject for a pending request.	Status becomes Rejected, no approved Calendar event is created, and decision notifications are sent.
AC-011	Calendar title	Approve a request.	The Calendar title is employee first name followed by request type.
AC-012	Calendar inclusive range	Approve a multi-day request.	The event displays every submitted date, including Last Day.
AC-013	Dashboard aggregation	Add request rows for an employee and category.	The corresponding dashboard category total updates using Days Total.
AC-014	General visual state	Set a dashboard category total between 1 and 4.	The cell displays a light-gray fill.
AC-015	Sick warning state	Set Sick between 5 and 9.	The cell displays bold red font on a light-gray fill.
AC-016	Sick highest state	Set Sick above 9.	The cell displays a red fill with bold, underlined white font.
AC-017	Initial sick alert	Set Sick to 10 while Last Sick Total Notified is lower.	The management alert is sent and Column L is updated to 10.
AC-018	Duplicate alert prevention	Run the scheduled scan again without increasing Sick.	No duplicate alert is sent.
AC-019	Incremental sick alert	Increase Sick above the stored last-notified value.	A new alert is sent and the memory value is updated.
AC-020	Time-zone consistency	Compare spreadsheet, Apps Script, and Calendar configuration.	All three use Mountain Time - Denver.

13. Requirements Traceability Matrix

Requirement(s)	Implemented by	Acceptance evidence
FR-001	PTO System Form access settings	AC-001
FR-002 - FR-006	PTO System Form field configuration	AC-002
FR-007	Google Forms response destination / Form_Responses	AC-002
FR-008 - FR-009	onFormSubmit(e) + Table1	AC-003
FR-010	Form_Responses Days Total formula + Holidays	AC-004 - AC-006
FR-013 - FR-019	onFormSubmit(e) Vacation overlap logic	AC-007 - AC-008
FR-020 - FR-024	Manager email + doGet(e)	AC-008 - AC-010
FR-025 - FR-029	doGet(e) + CalendarApp + Column I	AC-009, AC-011 - AC-012
FR-030 - FR-031	Decision email routing	AC-009 - AC-010
FR-032 - FR-034	Totals Dashboard formulas and conditional formatting	AC-013 - AC-016
FR-035 - FR-038	checkSickDayThreshold() + Columns D and L	AC-017 - AC-019
BR-001 - BR-006	Form instructions, roster, overlap logic, manager workflow	AC-007 - AC-010
BR-007 - BR-009	Date input and formula logic	AC-004 - AC-006
BR-011 - BR-013	Totals Dashboard conditional formatting	AC-014 - AC-016
BR-014	Employee Time Off Calendar	AC-009, AC-011 - AC-012
BR-015	Workbook / Apps Script / Calendar settings	AC-020

14. Operational Validation and Evidence

The specification is grounded in implementation artifacts and operating evidence rather than conceptual design alone.

Evidence source	What it validates
Production Apps Script source	Function names, event handling, overlap logic, decision routing, Calendar creation, email generation, threshold monitoring, and alert memory.
Workbook screenshots	Sheet names, table structure, dashboard layout, status fields, and visual states.
Workbook formulas	Business-day calculations, employee name derivation, and category aggregation.
Trigger configuration	Installable submission trigger and four-hour scheduled threshold scan.
Google Form screenshots	Required request fields, request categories, instructions, and confirmation behavior.
Calendar screenshot	Approved all-day event presentation and shared operational visibility.
Production metrics	162 requests and approximately 486 automated workflow emails over approximately 5.5 months.
Owner-validated operating behavior	Roles, decision authority, local coverage rules, and system administration.

14.1 Demonstrated Capability

- Translated local operating rules into structured, repeatable workflow behavior.
- Integrated Google Forms, Sheets, Apps Script, email, and Calendar into one production workflow.
- Implemented event-driven and scheduled automation in the same system.
- Mapped workbook data structures and formulas to automated decision and notification logic.
- Defined functional requirements, business rules, acceptance criteria, and traceability from a working implementation.
- Produced a living, version-controlled technical specification from a system independently designed and built.

15. Living-Spec Governance

15.1 Update Responsibility

The system owner maintains the specification as the production system evolves. Material changes require a new dated or numbered document version. Other staff receive read-only access to published specification versions.

15.2 Change Classification

Revision type	Definition	Examples
Minor	Improves behavior within the current Google Form / Sheets / Apps Script / Calendar architecture.	Authenticated email capture, added validation, notification changes, formula changes, or improved workflow logic.
Major	Replaces a core component, changes the primary interface or data model, or expands the deployment scope.	Progressive Web App, multi-location architecture, new backend or database, or materially different approval platform.

15.3 Specification Update Rule

- Update requirement statements when production behavior changes.
- Update component mappings when code, formulas, triggers, or services change.
- Add or revise acceptance criteria for each material behavior change.
- Update the traceability matrix so every implemented requirement remains connected to a verification method.
- Retain prior versions in the system documentation library.

Appendix A. Structured Pseudocode

A.1 Submission Processing

```

ON FORM SUBMIT
  read submitted employee, dates, request type, and reason
  identify response row
  IF request type = Vacation
    look up employee job title in Table1
    count Approved same-title overlapping records, excluding requester
    IF count >= 2
      send coverage warning to employee
      append warning to manager decision message
    END IF
  END IF
  send manager decision message with Approve and Reject links
END

```

A.2 Decision Processing

```

ON WEB-APP DECISION
  read row and action parameters
  write action to Status
  IF action = Approved
    create all-day Calendar event using First Day and Last Day + 1 day
    write Event Created
  END IF
  send employee decision notification
  copy supervisory recipients
  display confirmation page
END

```

A.3 Scheduled Sick-Threshold Processing

```

EVERY FOUR HOURS
  FOR each employee row in Totals Dashboard
    read Sick total and Last Sick Total Notified
    IF Sick >= 10 AND Sick > Last Sick Total Notified
      send management alert
      write Sick to Last Sick Total Notified
    END IF
  END FOR
END

```

Appendix B. Glossary

Term	Definition
Apps Script	Google's JavaScript-based automation platform used to connect Workspace services.
Business day	A weekday not listed in the Holidays table.
Coverage warning	Advisory notification generated when a Vacation request overlaps two approved same-title employees.
DOO	Director of Operations; operational approval authority.
Form_Responses	Named table containing PTO request records and workflow state.
Table1	Named Roster table mapping employee email to exact job title.
Web app	Deployed Apps Script endpoint that processes manager decision links.
Alert memory	Column L value storing the last Sick total for which an alert was sent.
Acceptance criterion	A test condition and expected result used to verify requirement behavior.
Traceability matrix	Mapping between requirements, implementation components, and acceptance evidence.