

ICEBERG — Executive Functionality Summary

System at a Glance

ICEBERG is an enterprise **HR and Resource Management** platform built on ASP.NET WebForms (.NET Framework 4.7.2). It serves as the single system of record for time tracking, project staffing, capacity planning, and time approval across a 569-person professional services organisation. The system comprises **119 ASPX pages, 40+ business manager classes, 50+ database tables**, and integrates with **12 external systems** (DocuWare, HubSpot, Active Directory, Axapta ERP, Google Calendar, 1C ERP, and others).

Production request log analysis (1,075,687 requests, Feb 2023 – Feb 2026) reveals the system's actual usage priorities, which diverge significantly from what the feature list might suggest.

Metric	Value
Total requests analysed	1,075,687
Unique users	569
Peak monthly traffic	83,000 (mid-2023)
System status	Declining since mid-2024; effectively sunset

Functional Areas by Production Usage

1. Timesheet Management — 51.8% of traffic (200,632 requests)

The dominant function. Employees record daily hours against project/task/activity combinations on a weekly grid. Key capabilities:

- **Weekly entry** (`TimeSheet3.aspx`) — project × role × activity matrix, 7-day columns, totals
- **Monthly view** (`TimeSheetByMonth.aspx`) — daily breakdown with overtime coefficients (internal/external rates)
- **Overtime recording** — separate internal/external coefficients (`k_internal`, `k_external`), delete-and-recreate persistence

- **Unfilled date tracking** — highlights gaps in employee timesheets

Critical rules: 8-hour workday, 7-day periods (Monday start), week-aligned persistence, internal marker `INTERNAL_ID = -1` for non-billable hours, three-level time locks (MonthFreeze > Division > Project).

10 ASPX pages | 11 business rules, 6 validation rules, 8 calculation rules, 4 workflow rules

2. User Management — 14.6% (56,443 requests)

Complete employee lifecycle: onboarding, capacity tracking, branch/division/pool assignment, status history, and deactivation.

- **User creation** — login, branch, division, pool, capacity (0–100%), contract type (6 types)
- **Capacity management** — temporal history with effective dates; capacity-to-hours conversion: $\text{hours} = \text{capacity\%} \times 8 / 100$
- **Deactivation** — cascading: clamps future frames, deletes future frames, requires zero day-off/work-off balance
- **Organisational hierarchy** — Branch → Division → Pool → User (with temporal history at each level)

Key rules: login unique system-wide, tab number unique per branch, auto-assign "Resource" permission group on creation.

19 ASPX pages | 5 business rules, 3 validation rules

3. Project Management — 13.8% (53,385 requests)

Project lifecycle from anticipated through completion, with resource assignment, budgeting, and milestone tracking.

- **7 status states**: Anticipated → Not Started → Initiation → In Progress → Warranty → Completed (+ Suspended)
- **Resource assignment** — capacity per user per project, split into internal/external, with "hole" detection for coverage gaps
- **Budget calculation** — $(\text{working_days} \times 8) \times (\text{capacity\%} / 100) + \text{overtime}$, excludes Anticipated/Suspended periods
- **Auto-completion** — scheduled job completes overdue projects after configurable delay, notifies PMs
- **SOW management** — statements of work linked to projects, coverage validation on approval

Key rules: root task immutable, status state-machine transitions, template assignments (`Employee = -1`).

25 ASPX pages | 10 business rules, 15 validation rules, 5 calculation rules, 5 workflow rules

4. Approval Workflows — 2.9% (11,322 requests | avg 5s response)

Three-tier time approval cascade with month-freezing:

1. **Project-level** (`ProjectTimeApproval.aspx`) — PM approves hours per user per role per month. Source toggleable: timesheet data vs assignment data. Requires SOW coverage.
2. **Division-level** (`DivisionTimeApproval.aspx`) — manager approves aggregate hours per division. Standard hours calculated during insertion.
3. **Month freeze** (`MonthFreezing.aspx`) — admin locks entire month globally. Requires `ApproveAllDivisions` permission.

Lock hierarchy: `MonthFreeze` > `DivisionLevel` > `ProjectLevel`. Approval uses OR logic — either project OR division approval makes a date read-only.

3 ASPX pages | 9 workflow rules

5. Calendar & Exceptions — 0.6% (2,445 requests)

Branch-specific working calendar with 14 exception types (`SickLeave`, `Vacation`, `BusinessTrip`, `MaternityLeave`, etc.).

- Non-intersection validation with asymmetric overlap rules (`BusinessTrip` → `WorkOff` allowed; reverse blocked)
- Calendar force-set: `Workday` → 8h, `Holiday` → 0h
- Auto-repair of `WorkOff` on calendar holidays (delete, truncate, or split)
- Vacation allowance by tenure: 0/7/14/21/28/35 days based on employment duration

6. Reporting — 0.2% (722 requests | avg 4.5s response)

18 report pages covering user time, project costs, resource utilisation, bench analysis, and financial exports (Axapta ERP, bookkeeping). Low traffic but high compute cost — consistently the slowest pages.

7. Skills Management — <0.1% (22 requests)

Hierarchical skill catalogue (folder/boolean/scale types), self-assessment, manager approval, skill-based search. **Effectively unused in production.**

8. Administration & Security — 0.2% (1,334 requests)

Permission model with 70+ permissions across 11 interfaces, four actor types (`User`, `Group`, `ProjectRole`, `ProjectResponsibility`), and fluent security API:

```
SecurityMgr.ForUser(id).AgainstProject(pid).EditDetails().DemandAccess(  
).Ten access context types spanning Global, Project, Branch, and Division scopes.
```

External Integrations

System	Direction	Protocol	Purpose
Active Directory	Inbound	LDAP	User authentication
HubSpot	Inbound	REST	CRM company sync
DocuWare	Outbound	REST	Invoice document storage
Axapta (Dynamics AX)	Outbound	SQL	ERP time approval export
1C ERP	Outbound	Database	Project/division/user export
Google Calendar	Outbound	OAuth/REST	Leave event creation
Mule ESB	Bidirectional	HTTPS	Message broker (notifications, portraits, errors)
BDW	Outbound	SQL Linked Server	Overtime data sync (event sourcing)
Google OAuth	Inbound	OAuth 2.0	Multi-provider login
Redmine	Outbound	REST	Error reporting
Liferay	Inbound	SOAP	Employee portraits