



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 stora |
| Axapta (Dynamics AX) | Outbound | SQL | ERP time approval expo |
| 1C ERP | Outbound | Database | Project/division/user |
| Google Calendar | Outbound | OAuth/REST | Leave event creation |

| | | | |
|--------------|---------------|-------------------|------------------------|
| Mule ESB | Bidirectional | HTTPS | Message broker (notifi |
| BDW | Outbound | SQL Linked Server | Overtime data sync (ev |
| Google OAuth | Inbound | OAuth 2.0 | Multi-provider login |
| Redmine | Outbound | REST | Error reporting |
| Liferay | Inbound | SOAP | Employee portraits |

