RESOLVE
Technical Brief

This document is provided in support of the general introduction data sheets which outline the RESOLVE products core capability and off the shelf modules and functions that are immediately available for deployment and customisation.

It is designed to provide a general technical guide to answer the most common questions and enquiries. If you do not find the answer to your enquiry here, please don't hesitate to contact the Graphical Data team via your customer contact point, or directly to the support desk – email support@graphicaldata.co.uk
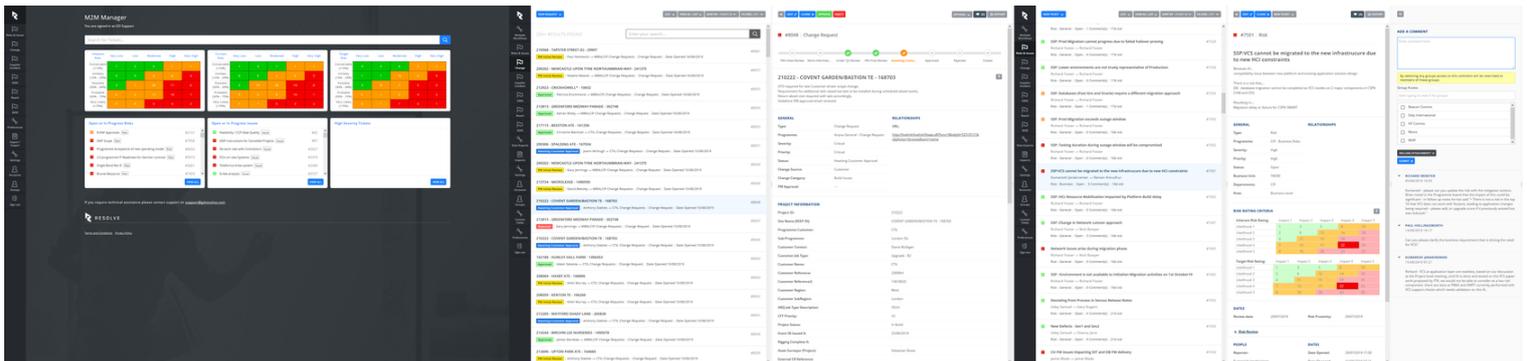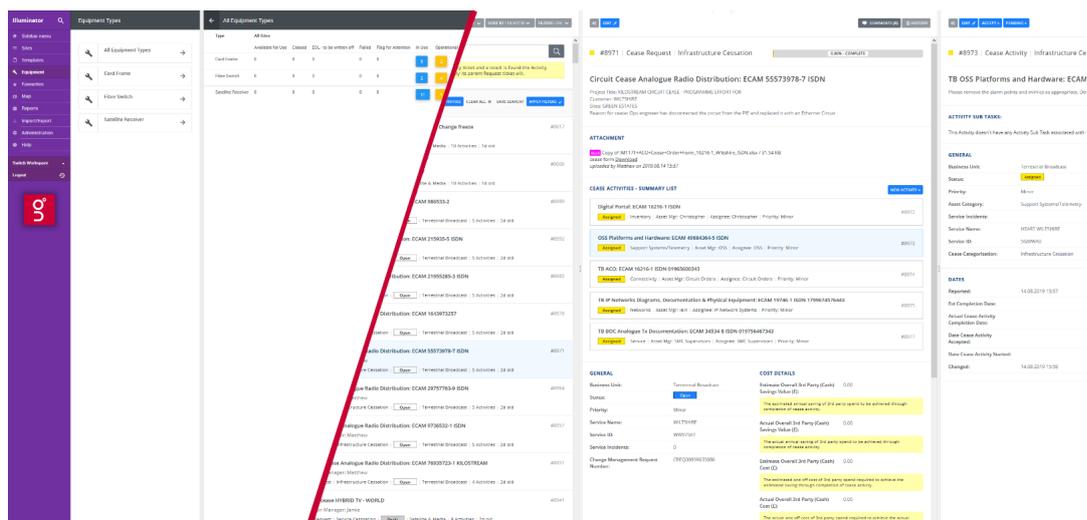

Image shows multiple views into ticket data stored in RESOLVE

Introduction

RESOLVE is the workflow and management software framework into which additional modules are plugged-in.

Example of how equipment repository stored in ILLUMINATOR and cessation process implemented in RESOLVE are handling tasks together

RESOLVE is a web-based database backed application with its main user interface built using technology standards from HTML / CSS / JavaScript thus making it compatible with most devices and platforms.

RESOLVE is unbeatable in its domain of managing and sharing information regarding the state and implementation of complex business processes. It makes sure "everyone is on the same page" when decision making time comes.

Architecture

RESOLVE is a modular, business process management system. Fully customisable workflows with dynamic event actions, powerful group based access control, understands diverse file formats and exports to high complexity and quality

Microsoft Office documents (Excel spreadsheets with graphs / charts, rendering to PDF, PowerPoint presentations) all created dynamically from live data, user interface geared towards quick data inspection and comparison, large dataset handling and many more.

Built with extensibility in mind for your current and future needs.
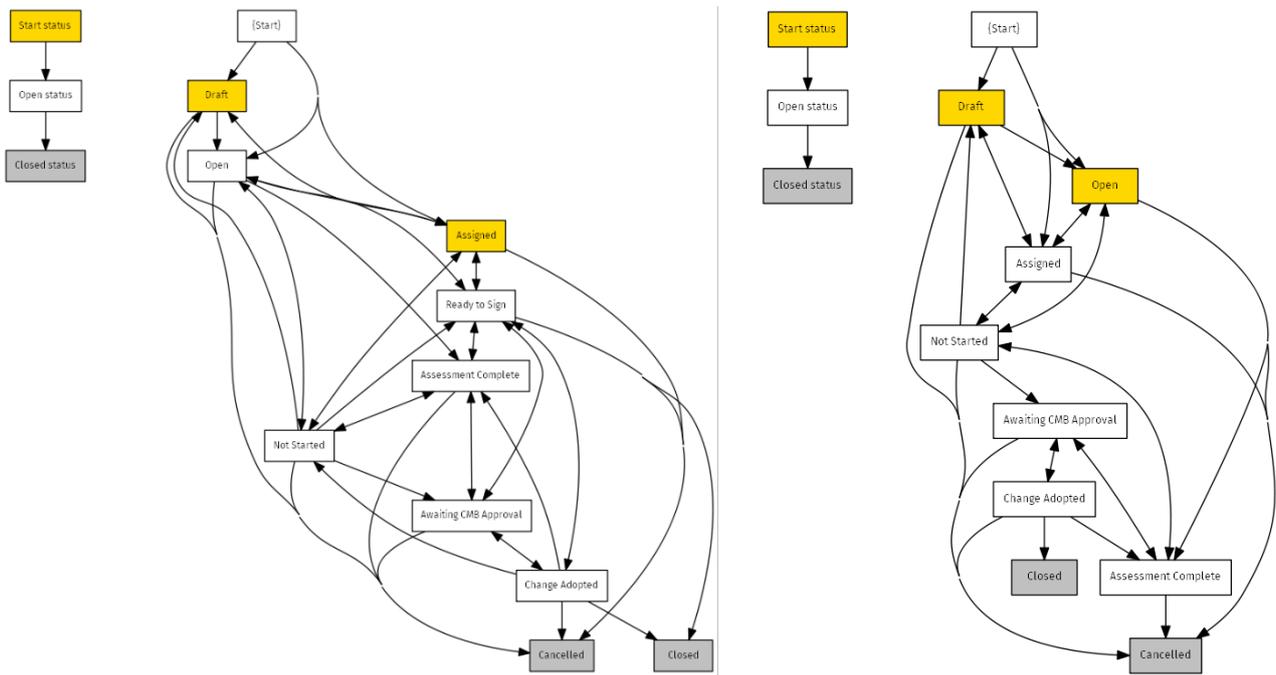
An example of a visual representation of workflows that can be interactively managed in RESOLVE

Integrations

- RESOLVE interactive exports can be embedded on most web-based portals and applications. These take forms of single HTML files that are self-contained rich and interactive exports
- A rich set of supported data exchange formats (XML, Ms Excel/Word/PowerPoint/Access, text CSV, PDF, SVG, PNG/JPEG)
- Common integrations include with Salesforce, JIRA, Bugzilla, Trello, GitHub Issues but the system is versatile and can communicate with an extensive range of applications

- RESOLVE has the ability to actively observe a number of email accounts for incoming tasks/tickets as well as restrictable ability to modify existing tickets (reply to an email to comment, approve/disapprove status etc)
- can provide data feeds in iCal/RSS/XML for calendaring and project management applications (Google Calendar, Outlook Calendar, Microsoft Project)

Reporting & Analytics

- Full data exports available at an agreed time rate for offline processing / analytics
- Built-in reports with graphically rich dashboards, user definable queries and configurable widgets that let users compose their dashboard to meet their needs
- RESOLVE reporting engine offers users the ability to query metadata. Metadata is 'data about data', i.e. information which is stored against a particular piece of data. To illustrate, take a Change Request ticket. A useful query may be to examine how many times a user edited this ticket, who that user was, what they changed, and when the last time it was changed. To do this the reporting engine must access the metadata tables which are stored against the ticket where such information is stored.
- User definable scheduled email reminders that can be turned on based on any saved search. Users can even share them between each other
- Conflict reports based on pre-defined variables (an example would be time and distance rules applied to location based jobs to ensure engineers were never double booked in two locations, had reasonable and safe travel time between journeys etc). All this can be highlighted or used for decision making in real time thanks to our live-evaluating rules engine

User Management

- RESOLVE can integrate with Microsoft Active Directory/Open LDAP allowing for centralised management using existing infrastructure
- Supports multiple sign-in options allowing for mixture of users logging in using different methods (username/password; AD authentication; token passing obtained by other systems). This allows for auto-authentication for employees and still requiring other auth method for 3rd parties
- Permissions and access are governed by a hierarchy of groups and users can be members in unlimited number of groups. This allows for finer control and rules on partitioning access to data and sharing ability
- System administrators get access to user control area, among many others, to register or edit user profiles, force password resets, grant or revoke group membership and perform many other sys-admin tasks.

Many of the user interfaces take the visual approach to configuration management and allow for interactive and intuitive drag 'n' drop type of operation
- Groups have built-in auto-membership feature allowing to automatically assign membership based on users data (matching email address, membership in other groups etc)

Security

- GD adopted safe programming and project management practices and enforces rigorous control over access to information and its security. We are ISO/IEC 27001 certified
- Access to our systems is guarded by multi-tiered security perimeters that begin with a low-level network firewall and culminate with human supervised but otherwise automated log analysis and anomaly detection
- Limits, and cool-down if a limit is reached, on any user action to avoid brute-force techniques
- infrastructure constantly updated and monitored with automatic intrusion detection and alarms
- Least privilege principles are applied to access to all systems, with full audit logs tracking our and your staff
- RESOLVE helps to protect from external as well as internal adversaries, users cannot impersonate others and data access can be aggregated and analysed over time to detect possible data leaks

Data Protection and management

- Your data is encrypted at rest (AES) and in-transfer (TLS 1.2 / 1.3) using the best solutions available at the time. We do not sacrifice security for compatibility and constantly test and validate our infrastructure
- Our backup process is fully automated and employs strong encryption from the very moment a snapshot is created. Encryption keys are automatically managed through our Private Key Infrastructure (PKI) and with redundancy across multiple geographical regions allowing for 99.999% no data loss policy.
- RESOLVE source code and customer customisations can be put in escrow upon request. If required, please advise at time of enquiry. In the past we successfully worked with Escrow London to provide necessary assurances our clients need
- Automatic auditing of data for consistency and integrity according to predefined rules and constraints

- Only trained and screened employees have access to your data under a watchful eye of our Data Protection Officer who is available to answer any queries you may have. Write your enquiries to support@graphicaldata.co.uk
- Multi-tenant architecture with full separation of databases as well as segregation within one RESOLVE instance means that you can let your employees work on projects where conflict of interest could arise if information was shared between different departments.
- System maintainers get access to administration areas to manage custom fields and their values, automated data feeds can be consumed to keep RESOLVE system in sync with other external sources (for example project IDs imported from the project management tool of your choice)
- all potentially destructive actions are transaction based to increase integrity including batch operations

Disaster Recovery

- When deploying on GD Cloud you are automatically protected by our trained staff and well-rehearsed recovery processes
- For On-premises hosting from loss of service to full recovery from backup in less than 6 hours with negotiable response and monitoring times. GD Cloud offers 99.99% availability and recovery times of less than 1 hour.
- Support for external backup and recovery systems and a great number of scenarios that increase resiliency. Fully automated code and data deployments guarantee exact copy of previously running system can be available in relatively very short time
- GD offers staff who are available for support during recovery and post-recovery fact checking

Compliance & Auditing

- Process for onboarding / offboarding users follows GDPR rules and our data processing and operating practices fully comply with EU rules
- We store only minimal set of user data, sufficient only to support authentication and access control checks
- All our systems working for you are hosted within the political influence area required by you. We operate data-centres in EU, USA and Asia
- You have full access to a log of actions/decisions taken by automation rules (with user visible artefacts like comments/notifications)
- Segregated testing, staging and production environments with a dedicated access for you to separate test/training platform
- Built-in company-wide data take-out facility. No need to ask for daily extracts and analytics

- RESOLVE implements and follows best practices advised by American National Institute of Standards and Technology (NIST), RSA®, The Open Web Application Security Project (OWASP) and others

Feature	GD Cloud	Private cloud	On-premises
Backup / Restore	Auto	Can use private infrastructure or GD backup service	Needs to use existing infrastructure
Uptime	99.99%	-	-
Scalability	auto	Provisioning new nodes or scaling existing ones in hands of IT dept	Provisioning new nodes or scaling existing ones in hands of IT dept

Deployment

Supported deployment scenarios include On-premises or hosting in the Cloud. GD offers options for hosting on our infrastructure where we completely handle the running of the application or on your private cloud infrastructure where we can support your IT staff but let them manage things on a day-to-day basis helping you lower the costs.

All above options are available on all support levels and can be GD managed, self-managed or combination of these.

Server-side Requirements

Resource	Minimal requirement
OS	Microsoft Windows 7, 8.1, 10; GNU Linux, Mac OS 10.6
Browser	The most recent versions of these web browsers on PC/Mac: IE 11, Edge, Chrome, Firefox, Safari, Brave, Vivaldi Mobile web browsers: iPad Safari/Chrome, Android 7+ tablets
Connectivity	Internet access

Performance, Scalability & Reliability

Resource	Minimal requirement	Optimal
Memory	2 GB	4 GB+
CPU	1 CPU, 4 cores	1 CPU+, 8 cores+
Disk space	500 MiB + required predicted data storage	1 GiB+
Networking	1 Gbit/s	1 Gbit/s+

- Scalable by design by utilising stateless node architecture for processing.
- Capacity can be increased by linear scale-out of nodes as well scaling particular nodes up
- Designed to handle extensive live datasets without decreased performance. In some typical instances or RESOLVE we manage we have observed 800k+ tickets, 100s of comments and thousands of users with response times of less than 1s

Customisation & Extensibility

- Fully configurable themes and interface with your choice of colour scheme to better fit-in with your existing tools
- Your logo to replace RESOLVE

- Any aspect of the user interface can be 'translated' to use terminology used by you
- multi language support (English and Polish built-in)
- GD offers development capacity to build fully custom solutions inside the ILLUMINATOR or RESOLVE instance, example past projects included scheduled tasks that deployed exported data over wide distribution network that was used for data-mining that fed operations, marketing and sales teams
- State workflows definable per ticket type allow for implementation of completely bespoke processes using graphical user interface for editing

API Access

- Supports REST, XML-RPC and JSON-RPC calls over HTTPS
- Limited interaction available over email (reply to RESOLVE generated messages to approve/disapprove state progression, reply to comments etc)
- Support for collector forms that can be integrated into virtually any other system and can be used to collect new tickets