Common Data Environment for Team Collaboration

Case study at a glance

This case study investigates the use of a cloud-based information environment to allow project participants to collaborate in one virtual location on a common platform.

Project

Recreation Centre, University of Canterbury,

Project phase

Design

Problem/Opportunity

On prior projects each participating organisation has created and managed their own communication repository, internal datasets, issues, and their own and other parties' metadata. Duplication of data leads to design errors, omissions, inconsistencies, and rework.

Potential benefits

More efficient team collaboration and better identification and resolution of design issues and errors.

Context

Multiple project participants need to utilise the same data for different purposes. Examples of this include:

- Quantification data (QS, Client, Contractor, Designer)
- Risk data (Client, Contractor, Designer, QS)
- Design issues data (Client, Contractor, Designer, QS)
- Health and safety in design data (Client, Contractor, Designer, QS)
- Project controls and requests for information
- Stakeholder feedback

There is a need to centralise these data sets and reduce the time impacts of individually managing the volume of project information.

What issue is this tackling?

On prior projects each project participant creates and manages their own communication repository (e.g. project-specific email folders), internal datasets and their own and other parties' metadata (such as company-specific model-object libraries), and team and or project issues registers for managing company and or individual project issues. Between each project participant there is an overlap and duplication of data. This duplication leads to errors, omissions, inconsistencies, and rework. This occurs both in the design and construction phases.

Opportunity

To improve design efficiency and quality by using a collaboration environment that allows the project design team to collaborate in one place on a common platform. Typical benefits from using such a platform include:

- Cloud-based storage system for remote access for design team.
- Issue tracking,
- Communications,
- Direct add-ins into design documentation management systems (BIM)
- Document repository.

Common Data Environment Solutions

The team has nominated the Revizto product which is a 3D model-based common data environment and has been allocated the following collaboration functions:

- Design issues (project team level, not design coordination level. Includes safety in design items).
- Risk register item.
- Cost issues & value engineering
- Stakeholder feedback
- Requested information items

Whilst Revizto provided some degree of collaborative communication channels, the system was still set up to notify the project team of task assignment and notifications via their native company system (i.e. email).

All project team members are members of the platform and have been asked to complete their work through the platform. Training and on-boarding was provided to all project participants in the use of the tool.

Issues are identified in Revizto via a 'stamp' tool, which allows team members to move through the 3D environment and tag areas of the design which need addressing. Tags can be grouped and categorised by a variety of custom designations, with the responsibility for resolution able to be assigned to other members of the team. This is particularly relevant for Value Engineering (VE) and Risk items where the required actions would typically sit on independent registers controlled by different team members. With this system, all resulting actions, whether they be risk mitigation, VE design development, VE costing exercises, design development actions, are all located on one platform making prioritisation of key project actions more holistic.

(i) Risk Identification and Mitigation Management

Project risks are identified and collated from all disciplines in a central risk register. Collectively these are rated using a project specific measure of impact (programme, cost, H&S) and given a probability factor resulting in a risk rating. Mitigation measures are identified along with team members responsible for those actions. Typically, these actions would be tracked somewhat statically via the risk register, owned by the Project manager. However, by making the risk items and their associated owners public and into the Revizto platform, mitigation progress and priority can be dynamically updated as the project and mitigation requirements progress. This provides more visible accountability across the project team and allows for individuals to filter tasks and actions assigned to them.

Mitigation actions are given a priority as per the Revizto platform, with the most critical actions being escalated, addressed and monitored at project team meetings. As actions are addressed and mitigation progresses the potential impact of the risk is reduced, and the rating updated accordingly in the comments section by the project manager.

The risk register at the start of the project is the baseline reference document, updated at the end of each period to demonstrate which risks are reducing and closing.

Pros

- Risk mitigation is dynamic where actions evolve as mitigation progresses, this platform records the development and reassigns actions in a live environment.
- Risks and the associated mitigation are addressed in the same platform as project issues – ensuring risk mitigation remains at the forefront of project development (Figure 1).

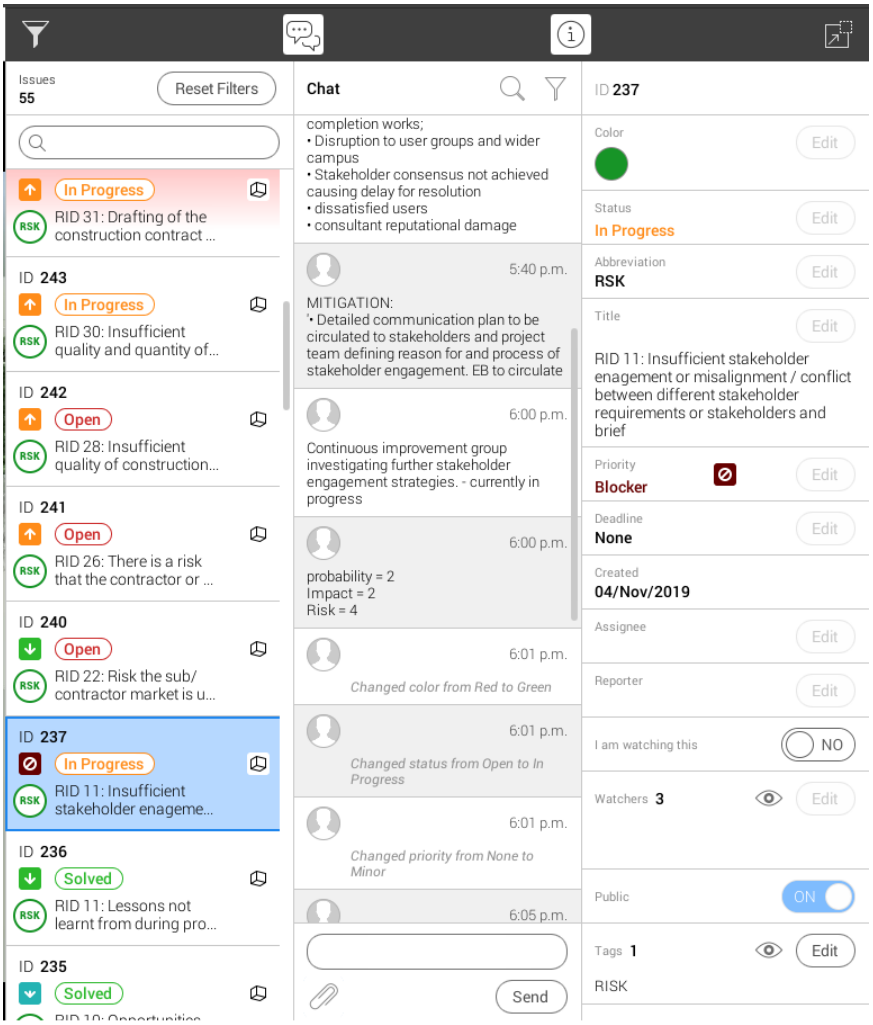

Figure 1: risk reporting and monitoring in Revizto

Cons

- Project risks are regularly reported at Project Control Group meetings and for this reason it needs to be easy to identify the risk rating i.e. which risk would have the biggest impact on the project. Revizto rates only the mitigation action priority. An excel spreadsheet risk register is still updated at the end of each design phase to address this, creating double handling of information. Ideally Revizto would be able to also record and filter the evolving risk ratings.

(ii) Value Engineering (VE)

Similar to project risks, value engineering opportunities are also typically recorded on and managed in a separate document. This work stream also looked to incorporate the identification and development of VE opportunities within one centralised platform. Ensuring actions resulting from VE opportunities are efficiently assigned and closed.

A specific 'stamp' is used within the Revizto model to identify a VE opportunity, the design or costing action is assigned to the relevant team. All stamped VE items can then be exported as a complete outline of the VE opportunities explored through the period.

Pros

- Collates VE identification and actions in one platform

Cons

- No data input location specifically for costs so these need to be manually added to the summary report (indicated by red box in Figure 2).

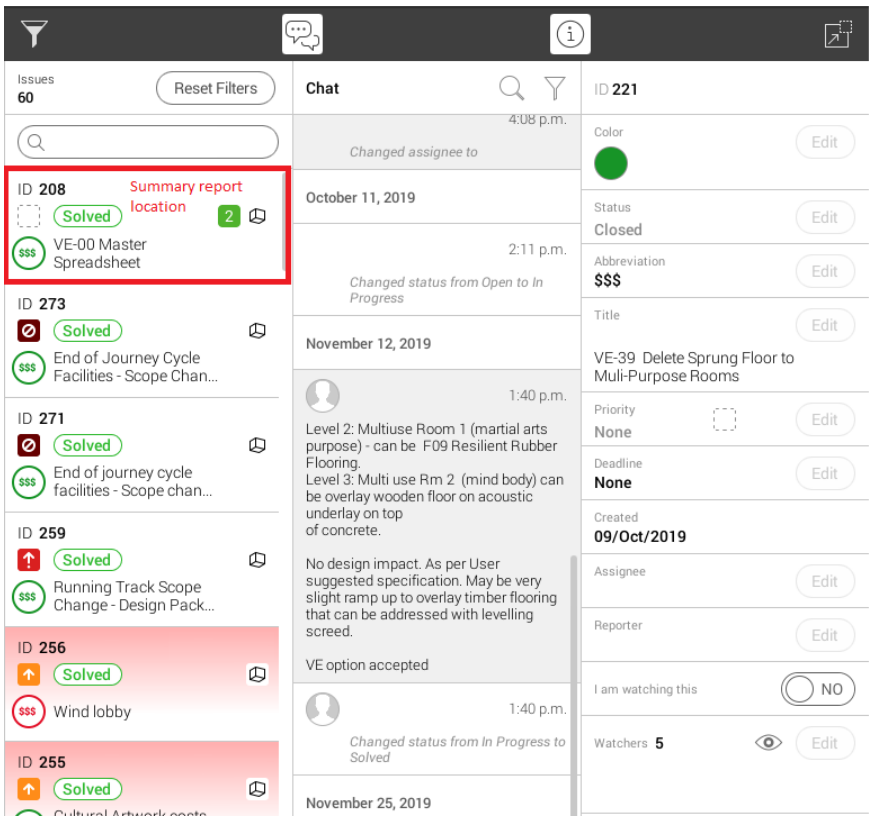

Figure 2: example of Revizto environment showing lack of cost data input

(iii) Design Issues

Design issues are generated for various reasons such as, in response to stakeholder feedback, coordination complications, scope changes, and design team RFIs, which can require input from numerous different sources. Design issues sit alongside the existing platform the design team currently use for design coordination items while giving access to the wider project team members who may be required for input (Figure 3). Priority design issues can then be filtered and exported.

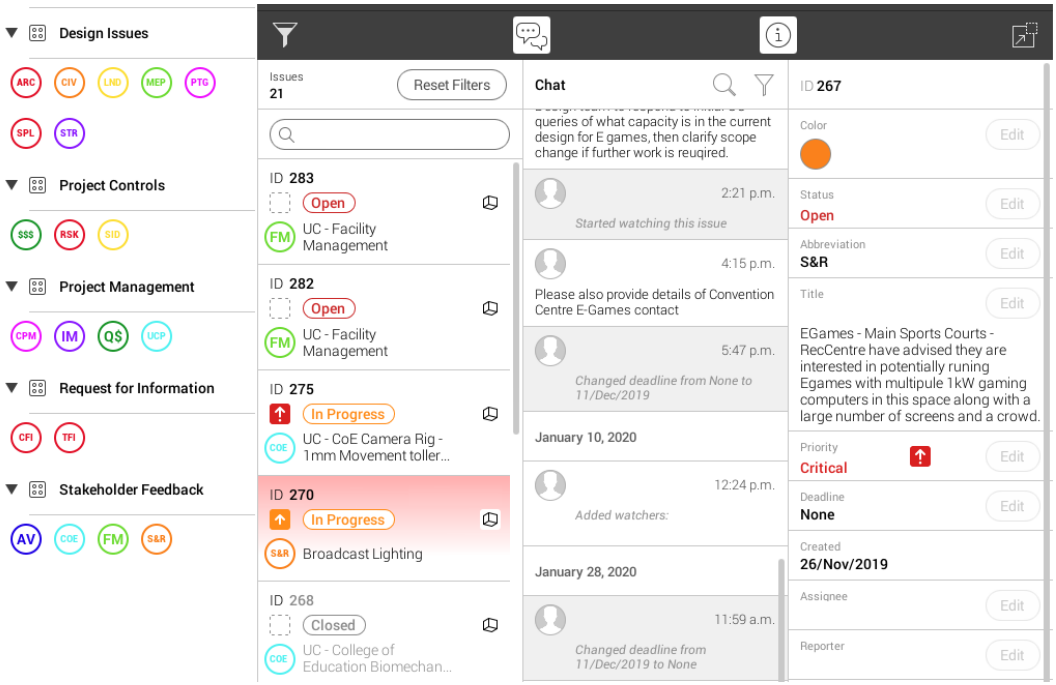

Figure 3: Revizto tool allowing stakeholder feedback and RFIs to sit alongside design issues.

Pros

- Collates and prioritises design issues in one platform. Design issues can be identified by the whole project team, with actions immediately assigned and communicated to project team members for input.

Cons

- Two platforms are required: 1) project team and 2) design team. This leads to duplication and ambiguity as to where and how issues are managed.

Benefits

The benefit of a common data environment is more efficient team collaboration to expedite the identification and resolution of design phase actions.

User Experience

Use of one centralised system has provided the project with a repository of all project issues, whether they are design issues, project risks, or VE items.

Management and use of the platform has had mixed results. Some of the comments from project team members were as follows:

1. It was easy for teams to revert back to traditional communications such as email. By going “off platform, because the team still required the use of their company email for work communications, the data in the platform became aged and not accurate, and thus the usefulness of the platform was reduced;
2. The platform was a BIM model-based platform, with some data entry and management capabilities. The platform did not provide a powerful enough tool to allow for the deeper data collaboration that was needed for a project team to work efficiently. There was a disconnect as many of the issues were not related to the BIM model;
3. Project team members preferred to run their datasets in isolation from one another. Existing internal business processes were preferred to working in a project specific collaborative platform. Users have years of built up process which means that they each work more efficiently on their own systems;
4. Having two environments was an issue. The need for two platforms really came about through the design team and project team role organisational structures and contracts. As there was an unclear and disorganised communication channel for stakeholder feedback, trying to incorporate this into a single environment with the design team became unwieldly and became difficult to manage which feedback required actioning by the design team. Therefore, one environment was created to collate and organise the stakeholder feedback which could then be filtered through to the design team. An alternative team organisational structure may have allowed for the use of one environment by all parties;
5. The incorporation of the risk register proved difficult as the client had their own risk tracking requirements, which could not be incorporated in as part of the specified system. The workarounds to achieve the required outputs made this work laborious.

With Thanks

BIP would like to thank the key collaborators involved in participating and delivering this case study:

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RCP

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