AUTODESK UNIVERSITY 2014

Vault Professional for Infrastructure Projects and Business-Document Management: Actual Experience

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CV5768-P

This round-table discussion will focus on the actual experiences that infrastructure engineering companies have working with Vault software. The speaker will present a training strategy that was especially useful for introducing employees to Vault software. He will also share experience regarding effective motivations for employees. The discussion will include the functionalities of Vault software most useful to and appreciated by engineers, managers, and administration. We will examine the main advantages of Vault software as seen by the employees of the company (the administration, managers, engineers, and IT and CAD administrators) who carry out different functions and use different software that includes Vault Client software, Microsoft Office software, AutoCAD LT software, AutoCAD Civil 3D software, and Bentley Microstation software. The speaker will share practical ideas for optimizing Vault software through the use of additional programming and configuration. The discussion will also cover tasks for job servers.

Learning Objectives

At the end of this class, you will be able to:

- Discover practical advice on facilitating transition of employees to Vault Professional software, and find out the a great training strategy
- Find out what functionalities of Vault Professional software are most appreciated by infrastructure engineers and business-document managers
- Find out the views of different users, including CAD administrators, why Vault helps manage projects more efficiently
- Discover tips and tricks on Vault Professional software optimization

About the Speaker

Darius Simkunas is the chief programmer at JSC Kelprojektas, the biggest infrastructure engineering company in Lithuania and the Baltic countries. He is responsible for the strategy, development, and adaptation of Building Information Modelling (BIM) and engineering software. Darius has over 10 years of experience with Autodesk, Inc., products, consulting and instructing the company's employees. He was an Autodesk University speaker in 2013. He has been working with AutoCAD Civil 3D software since 2005 and has a portfolio of functionalities for specific regional and company needs. He is an AutoCAD Civil 3D Certified Professional, he has been an Autodesk Developer Network (ADN) member since 2008, and he has been working on infrastructure projects using new technology and methodology. Since 2012 he has been responsible for the implementation of Vault software in Kelprojektas. As the project

manager he directly participates in the stages of implementation, strategic and technical issues resolution, and product functionality enhancement according to the company's needs.

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Introduction

An innovation that is going to affect the majority of employees in the company is always accompanied by questions and doubts. The decision to adopt a DMS is an important and responsible step for every company. The installation of a DMS is unique in a way that tangible results and benefits can only be seen once the system is installed across the entire company or along the entire production chain.

Before deciding to install a DMS, JSC Kelprojektas carried out exhaustive analysis of software, and implemented pilot projects (see CI1889-R: Implementing Vault in an Infrastructure Engineering Company: An Actual Experience.), but the experience of peers already using DMS in companies similar in nature and tasks is always very important.

In this session I would like to share my experience on installing Autodesk Vault in our company, the lessons we have learned during the installation and, most important, to tell about the work on real projects. During the session, I will present examples and ideas on the optimisation of the installation process, and making the work even more efficient by developing additional applications. I will also elaborate on the features most appreciated by employees of different profiles.

About JSC Kelprojektas

JSC Kelprojektas is currently the largest group of transport infrastructure engineering companies in Lithuanian that designs transport communications, public use buildings, engineering systems, and performs territorial planning works, etc.

The company was set up in 1956.

The main headquarters of Kelprojektas since the commencement of activities is located in Kaunas; later on the company set up regional subdivisions in Vilnius, Klaipėda, Šiauliai, as well as Tallinn.

Now JSC Kelprojektas has more than 220 employees.

Almost 6,000 of projects of various scope and complexity. Dozens of thousands of kilometers of roads, streets, and railways built and renovated. Bridge projects, territorial planning projects, which were awarded great appreciation and highest ratings. It is just a part of Kelprojektas group of companies contribution to modernization of the national transport infrastructure.

The objective of the company is continuous progress. In order to ensure premium services, Kelprojektas continually invests into advanced solutions, innovations, and up-to-date engineering technologies, improves work processes as well as personnel's skills.

Specialists of JSC Kelprojektas work with various software:

- Autodesk - AutoCAD, AutoCAD LT, AutoCAD Electrical, AutoCAD Architecture, Robot Structural Analysis, AutoCAD Map, 3ds Max Design, AutoCAD Civil 3D.

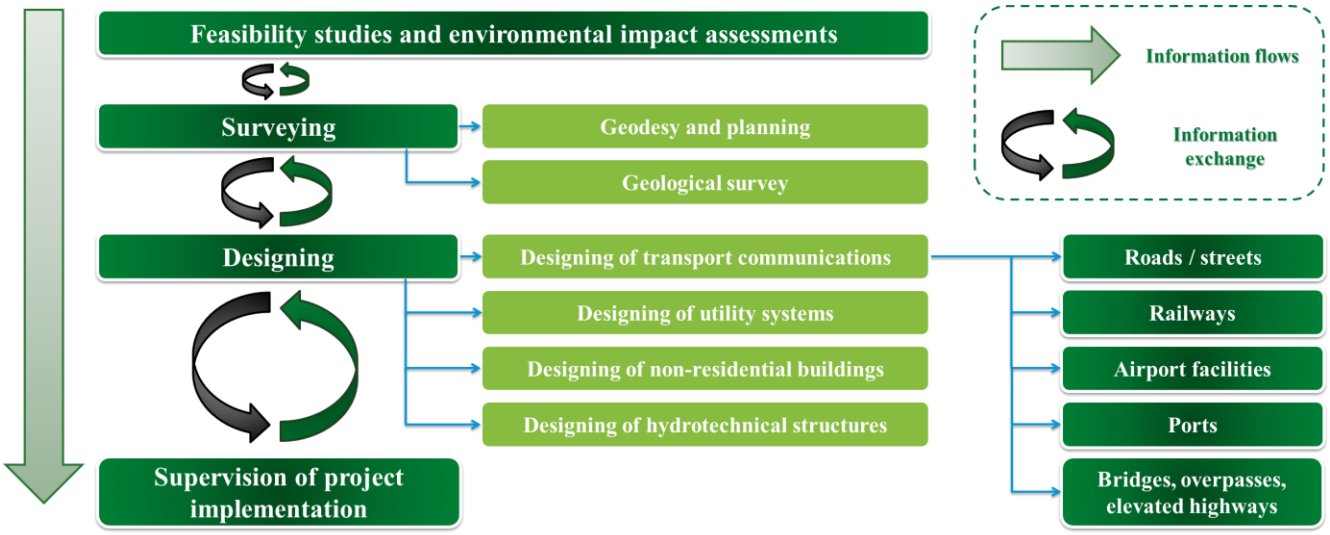
- Bentley – Microstation, STAAD.
- SoFisTik, ANSYS/Structuraland etc.

Autodesk products comprise about 80 % of the company's engineering software portfolio.

Main software is AutoCAD Civil 3D.

Why we need Vault?

JSC Kelprojektas provides a wide range of services (Fig. 1). Often a single project is carried out by a number of teams of employees working in different fields, and the project may continue for as long as five years. It is very important to ensure smooth cooperation of different teams using different software. When a project continues for a long time, traceability and control of information flows becomes important.



Working with a File Share Server could no longer meet our requirements and in 2008 we began looking for software that could solve the problems we were encountering at the time and make the work more efficient. The main task was management of engineering documents.

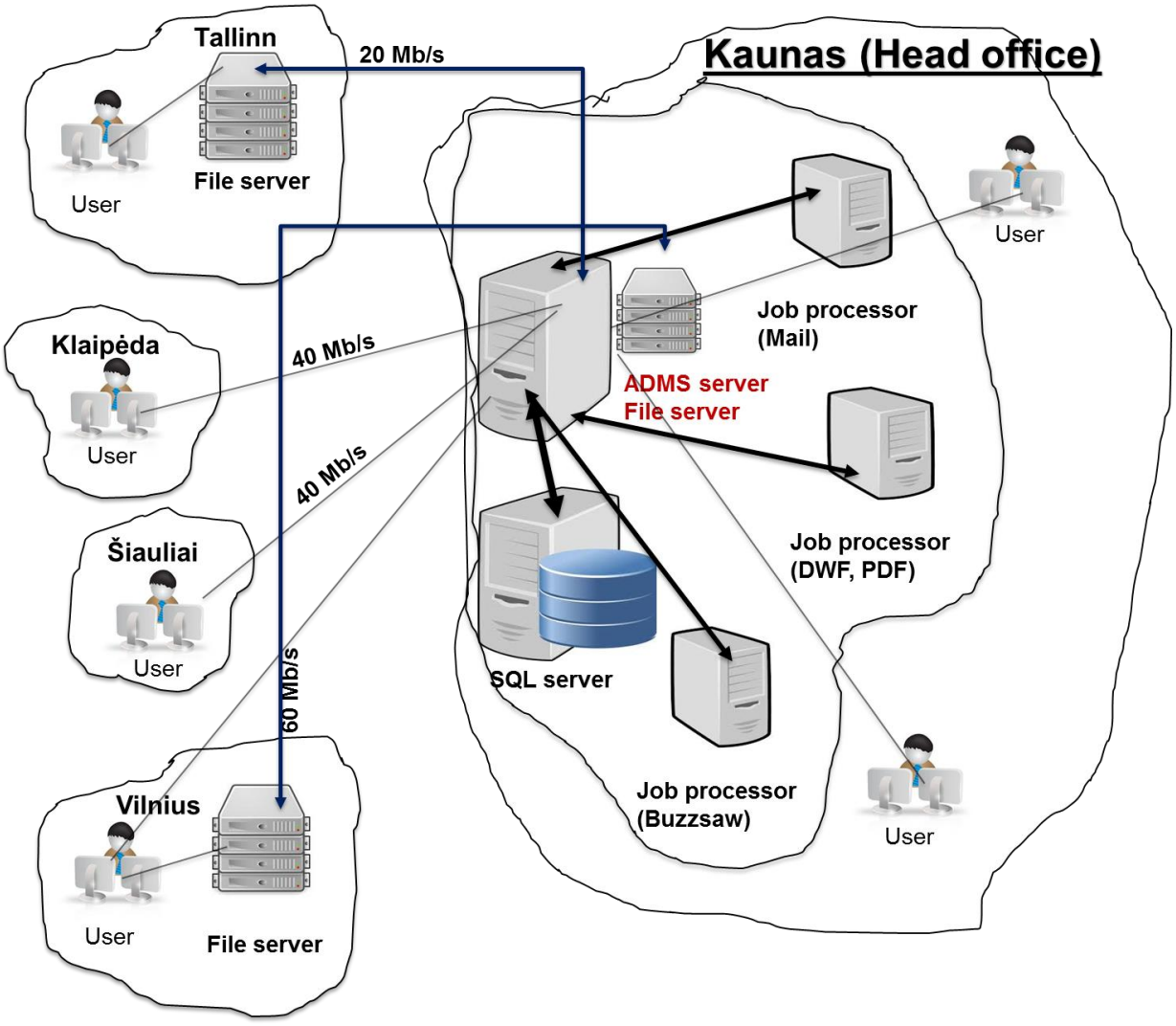
After the initial analysis the searching stopped. It resumed in 2010 with a new key requirement for the DMS – the support of Civil 3D data shortcuts.

Yet another requirement – management of business documents – was added in 2011. Pilot projects were carried out using selected systems, and companies using DMS systems were visited. It was no easy task to find companies of similar profile and size using DMS.

The implementation of Vault started on 1 September 2012. This DMS suited our requirements best; it was able to solve different tasks and featured integrations with various software.

Diagram of the Vault system

- ADMS + File Server
- 3 Job Servers (CAD to DWF, PDF; Mail; Buzzsaw)
- 4 remote offices, one of them in another country
- A total of 200 users; around 120 of them in the head office
- Connection speed between offices from 20 Mbps to 60 Mbps
- File Server in the biggest remote office and in the office of another country with a slower internet connection



Job Servers:

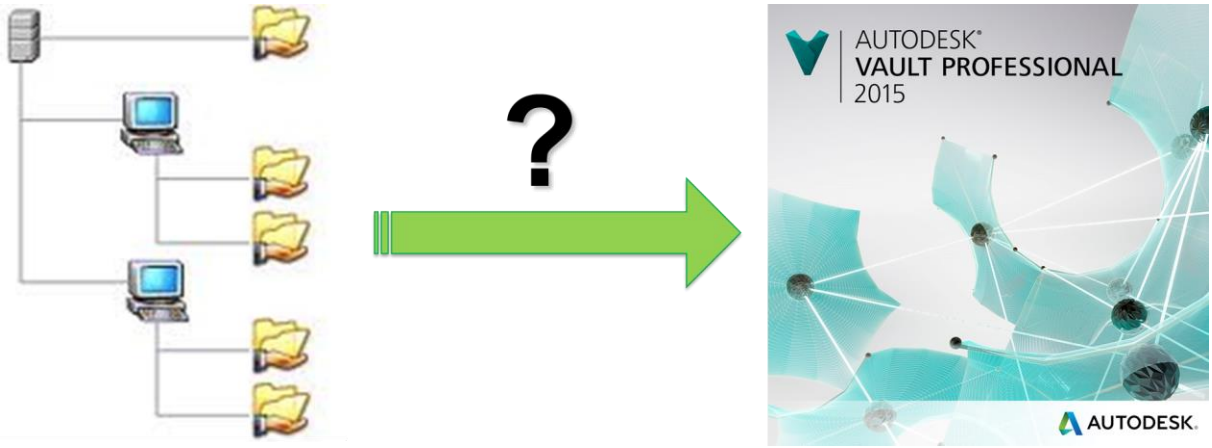
- E-mail Job Server sends e-mail messages initiated by Lifecycle or Watch Folder processes. This server is installed on a virtual machine and uses minimal resources;
- Buzzsaw Job Server synchronises data Buzzsaw-Vault-Buzzsaw. This server is installed on a virtual machine and uses minimal resources;
- Job Server generating DWF, PDF. This server is installed on a separate computer with a fast CPU, 16 GB RAM, SSD hard drive and a fast video card.

Current situation

- Around 35 projects in Vault;
- Around 10 operational business processes;
- Around 35,000 files, 60 GB storage;
- Around 20 life cycles for engineers and business;
- Around 40 file/catalogue categories;
- Over 150 custom attributes;
- Template for project catalogue structure;
- Training material for users;
- Additional tools for users and administrators;

Vault has been installed and set up. What next?

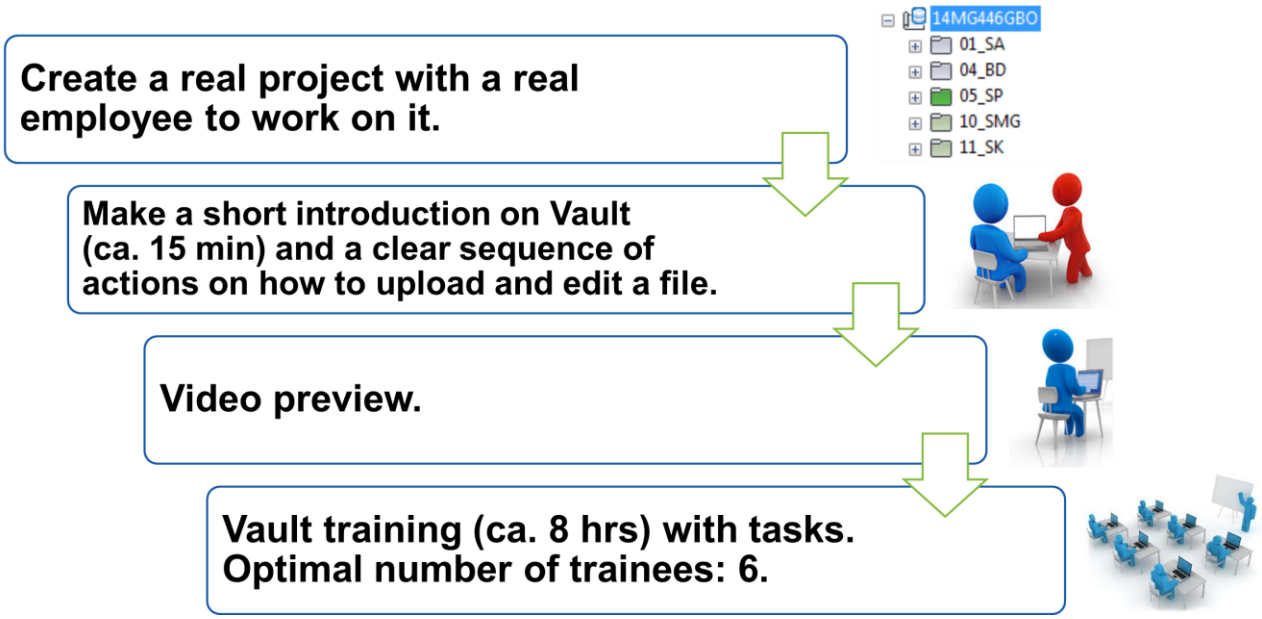
How to ensure smooth transfer to working with Vault?



Do your homework:

- Analyse and organise the needs of all users;
- Create the Vault environment for training;
- Create training material based on examples and situations specific to your company;
- Create videos explaining how to accomplish certain tasks;
- Create technical documentation;
- Prepare a working scenario for key positions.

The easiest way to start working with Vault



Successful and smooth start of an employee with Vault is an important component of implementing the system across the company. During his/her first steps in Vault the employee has to receive clear instructions on the sequence of actions, and understanding of why these actions are taken. More information on Vault is provided during subsequent training. Usually training lasts 5 to 9 hours. The duration of training depends on the functions carried out by the team.

List of topics for training courses:

1. Concept and application of data control and management;
2. Work with Autodesk Vault client;
3. Categorisation of documents; management of properties; and life cycles;
4. Integration into software packages;
    a. Work with Autodesk Vault in MS Office environment;
    b. Work with Autodesk Vault in MS Outlook environment;
    c. Work with Autodesk Vault in AutoCAD environment;
    d. Work with Autodesk Vault in Civil 3D;
    e. Work with Autodesk Vault in GeoMap;
    f. Work with Vault and Bentrley Microstation software;
5. Work with Vault through a web client;
6. Overview of Autodesk Buzzsaw technology.

Important for users:

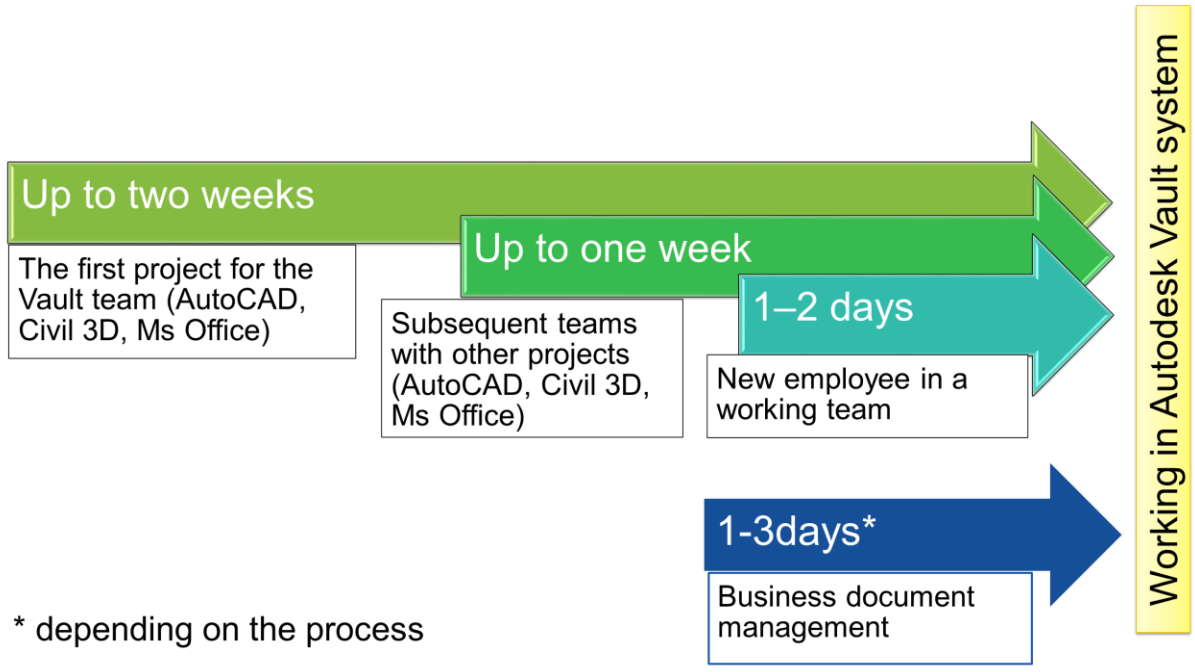
- **Once you start working with Vault there is no turning back.** Any encountered problems have to be solved in Vault;
- All the necessary and relevant information must be accessible within Vault;

- Vault is not a storage/archive of data – it is a place for real time working with and sharing information;
- If the project is carried out in Vault, no file should be sent by e-mail – only links. Everything can be found in Vault.

Important for Vault installer and/or administrator:

- **Once you start working with Vault there is no turning back.** Reserve enough time for user assistance;
- Employees have to be sure that they will always receive help on any encountered problems;
- The project has to be finished on time – don't start with a problematic project with a tough deadline;
- Monitor the project and prevent the problems. Vault allows to foresee potential problems.

Time required to adapt to working with Vault... What are the real numbers?



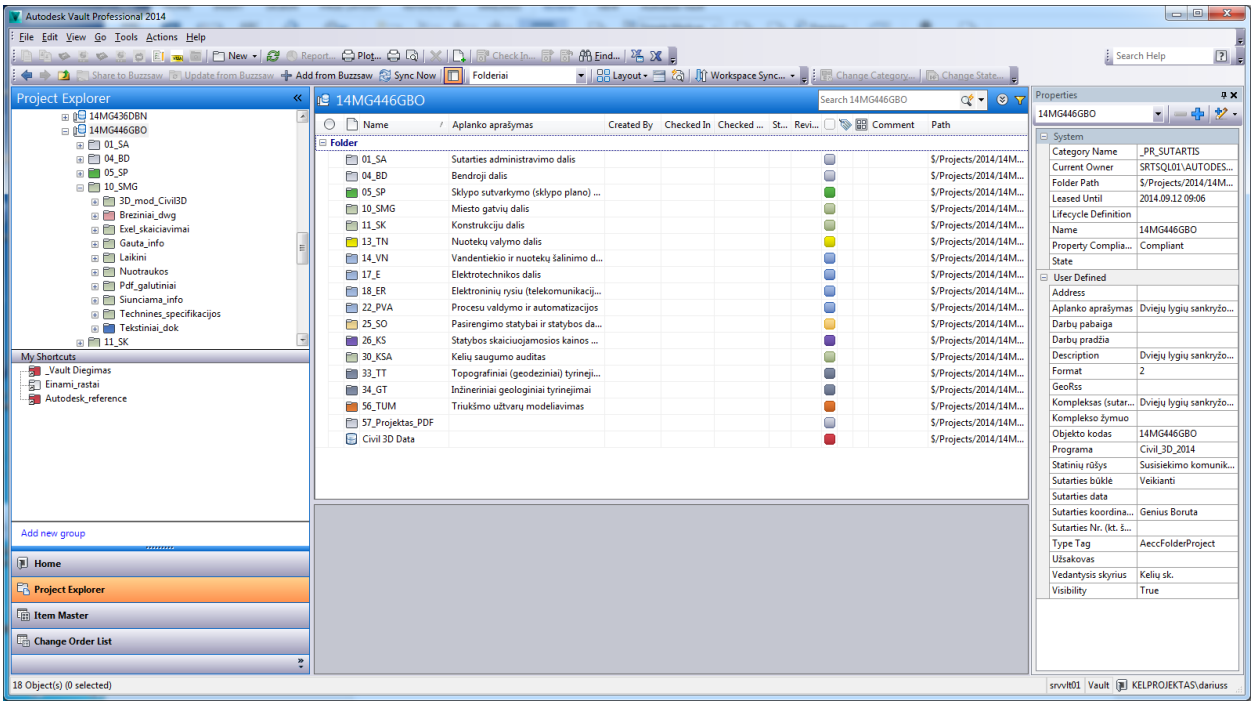
* depending on the process

What motivates employees the most?

- Transparent company policy;
- All information relevant to the project can be found in Vault, which makes the work easier and faster;
- Files not uploaded to Vault cause trouble for colleagues;
- Vault makes collaboration with employees carrying out different functions more effective.

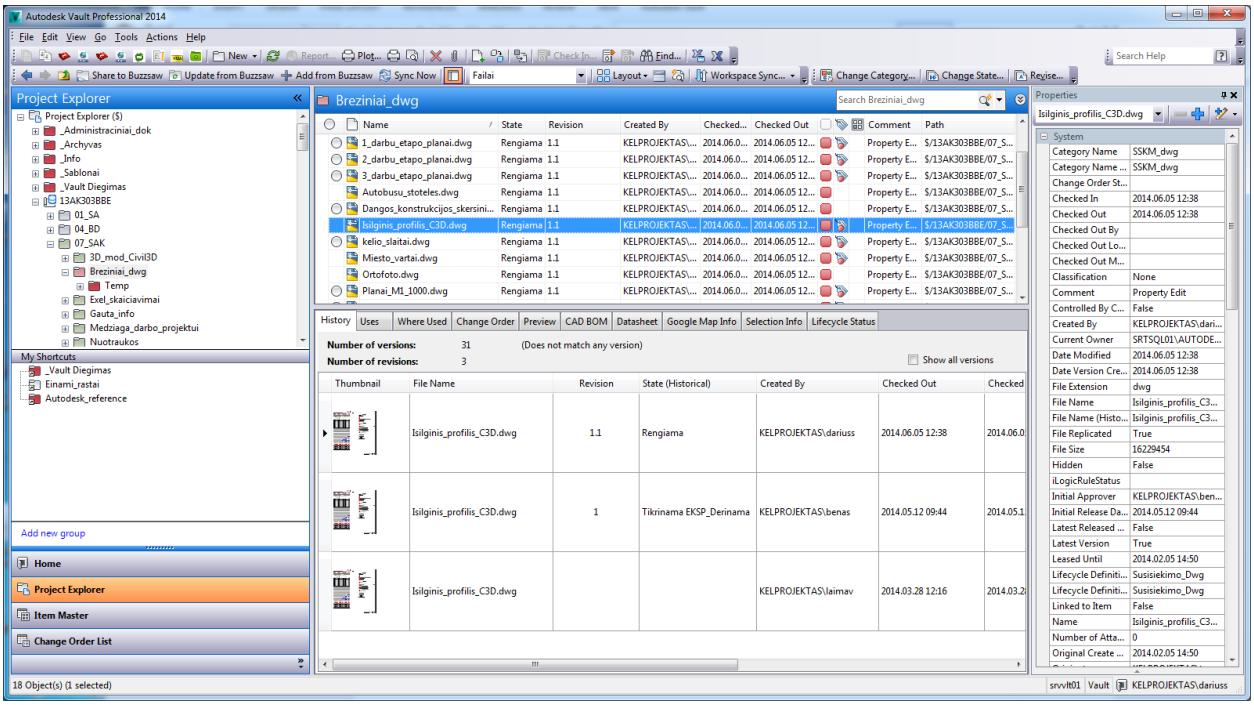
Features appreciated by infrastructure engineers:

Ability to have the entire project in a single place and work with it in an efficient way



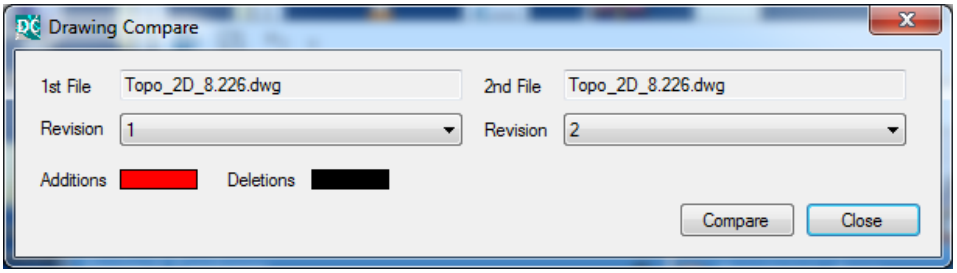
Having the entire project in a single place and working with it in an efficient way is very important to all employees. Using File Share Server makes work inefficient for remote subdivisions. Ability to permit editing without deleting the file provides additional safety and comfort for employees and project manager.

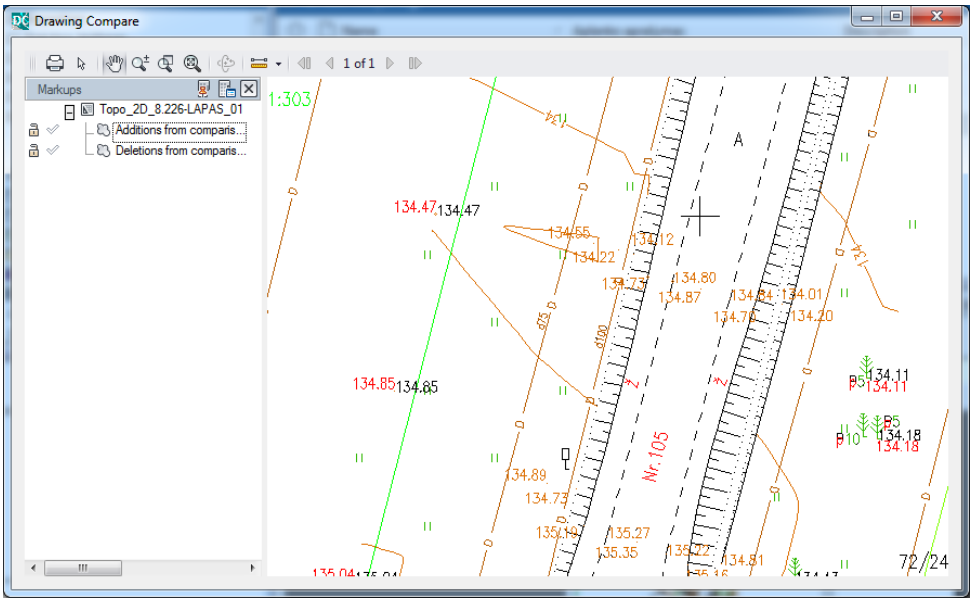
File versions and revisions (comparison); file history (who and when uploaded the file); comments



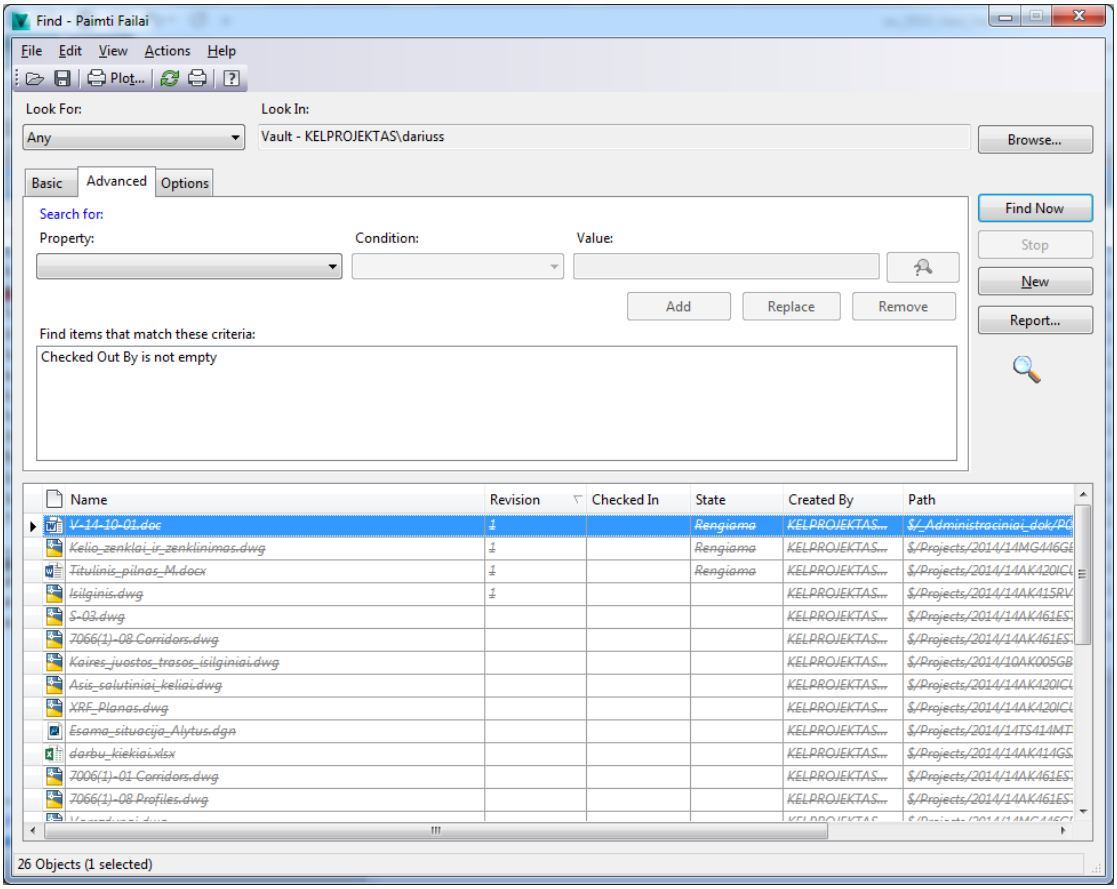
It is very convenient for employees to see when the file was uploaded and by whom, while comments help save a lot of time spent looking for changes. This may not be relevant when working on the file every day, but after a month or a year this information may become very important. When the project is carried out by a team of employees from different departments this is a salvation for the project manager supervising the progress.

File revisions are handy for recording key stages of the file, while ability to compare two revisions speeds up tracking of changes made to the drawing.





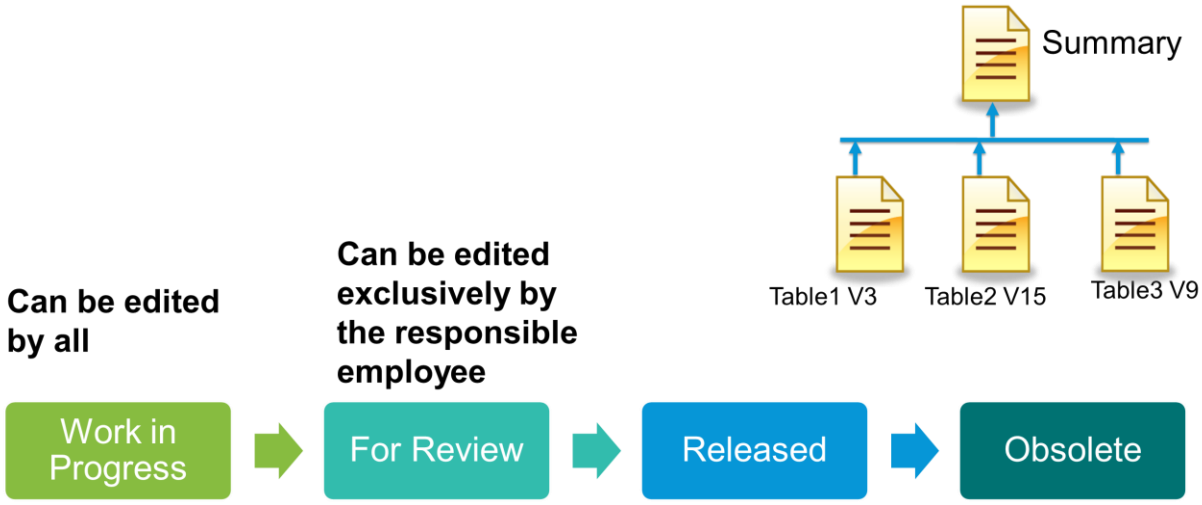
Search; filters



Search and filtering has a very wide range of application. Everything depends on the configuration of the system and the ability of users to use it. I will provide a few simple examples of used searches:

- Search for documents that are currently being edited by the user (reminds to check-in all documents to Vault when the work is finished);
- Documents that need confirmation/checking by the user;
- Documents from a selected project that are currently being edited (helps the project manager to monitor progress).

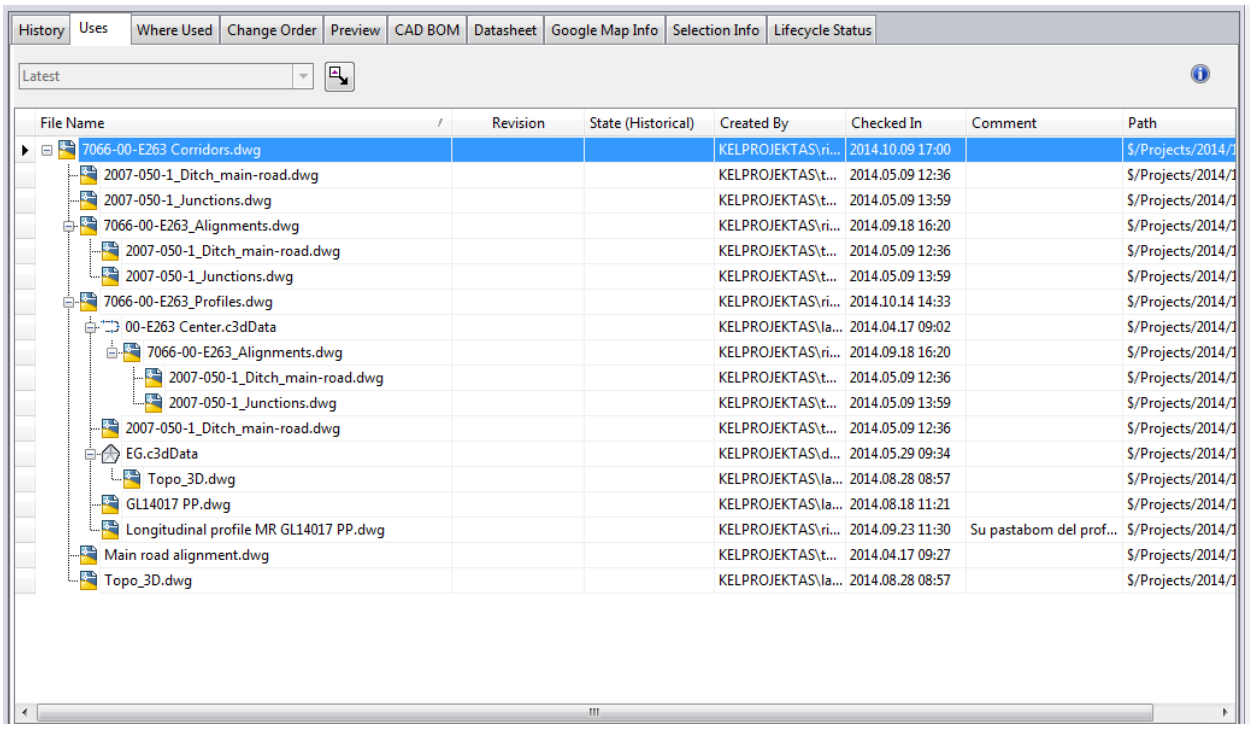
Life cycle allows to see the stage of the file and make proper decisions

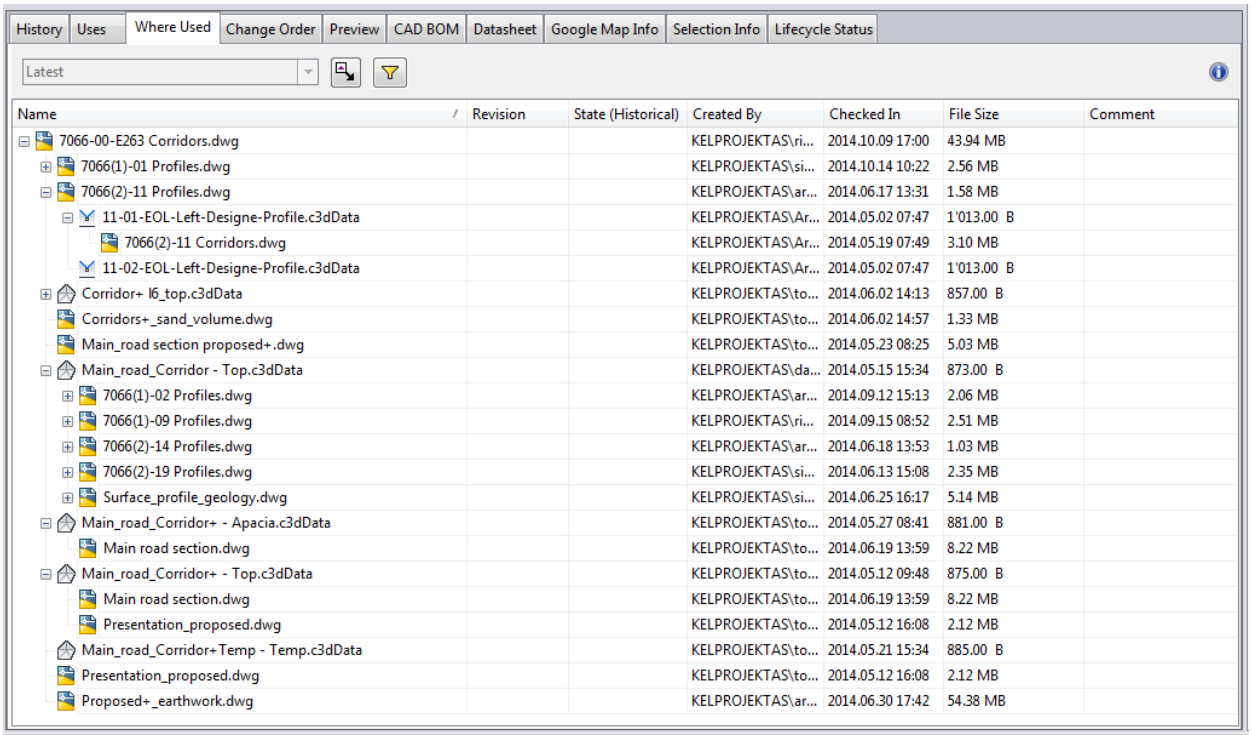


Lifecyle is a very important element in project management. When multiple teams are involved it is very important to know the status of the file and to be sure that it is not modified without noting others.

Lifecycle also plays an important role when all work is done by a single team. When several engineers prepare different bills of quantities, and the team leader has to sum them up, it is important to ensure that no files are modified without his/her knowing. This helps prevent misunderstanding and human error.

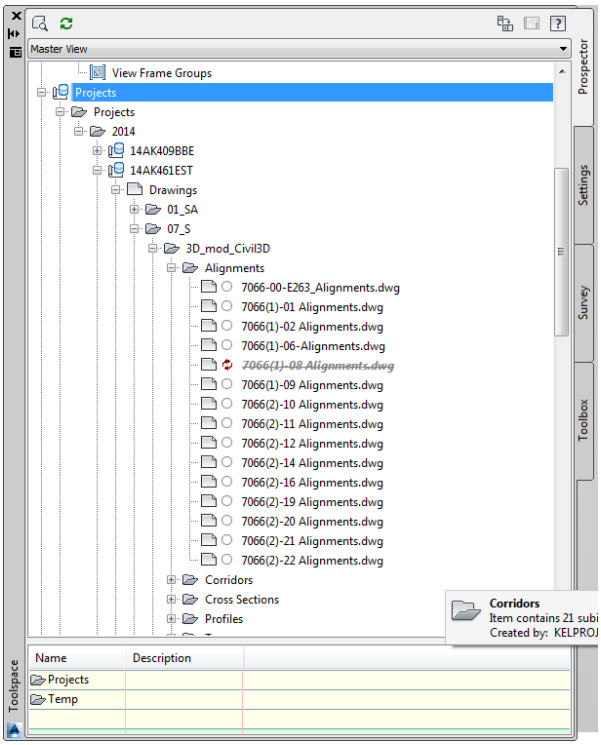
Ability to see where the file is used and by whom Preservation of links among files





Vault enables fast and convenient review of all file links – what files are used by the file and where the file itself is being used. This information can promptly show where the file is stored

and who its author was. When the file is deleted, Vault will warn the user that the deletion can have an impact on other files. In such case, only users with administrator rights are authorised to delete the file. When the file is renamed, Vault will retain all links and all linked files will know the new name.



Integration into Civil 3D data shortcuts enables working on a single project involving remote subdivisions. Integration into AutoCAD

Prior to editing the files, Vault sends them to C:/ disk with all the relevant information and linked files. This enables the colleagues from the same Civil 3D project team to work in a remote subdivision in an efficient way and in an off-line mode.

Features appreciated by business document users:

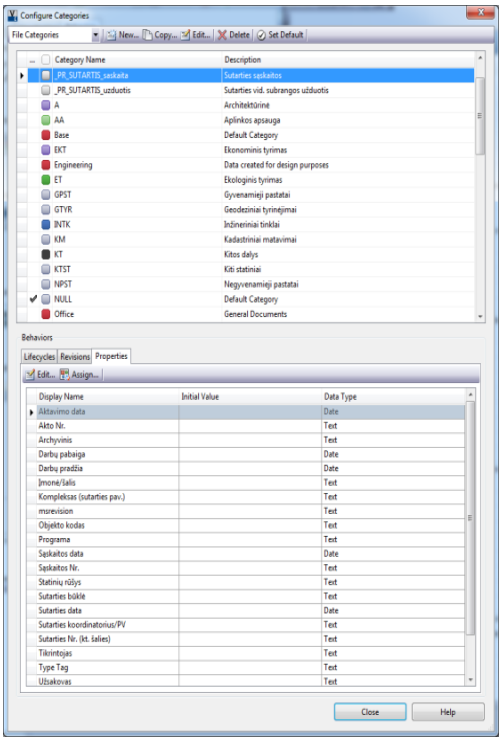
- Search, attributes;
  - Filtering documents according to attributes or Lifecycle stages;
  - Formulating tasks for self and colleagues;
- Reports;
- Lifecycle and automated processes;
  - Automated e-mails;
  - Automated task generation.

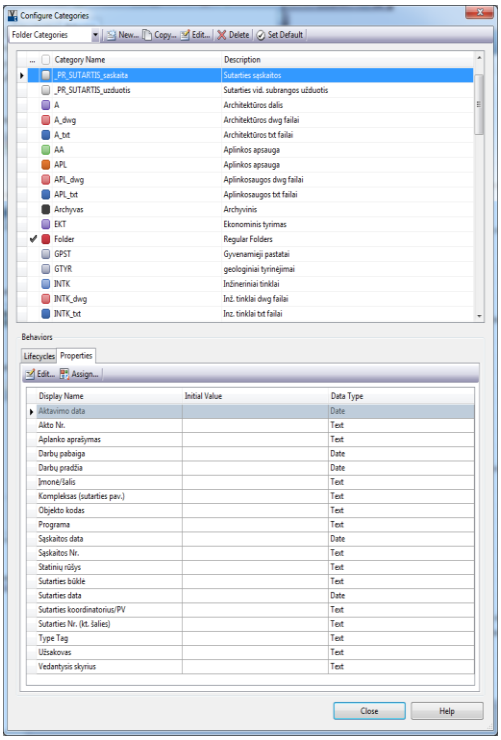
How Vault helps IT and CAD administrators:

- Ability to see the big picture;
- File history;
- Links between files;
- Ability to go back several versions;
- Ability to recover a similar situation in a separate computer;
- Real-time monitoring of the situation;
- Monitoring which files have not been returned to Vault on time;
- Identification of files that don't meet the required standards.

Developing additional applications: a few ideas to make the work more efficient.

Auto file category assign by folder category



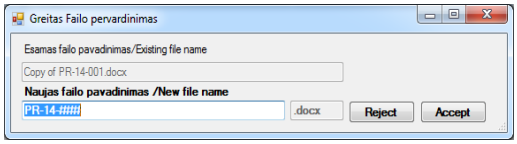


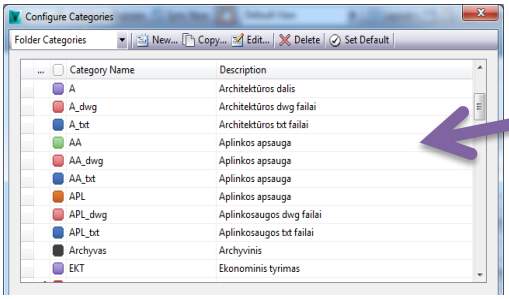
File receives the same category as the catalogue, if the category exists on the list of categories.

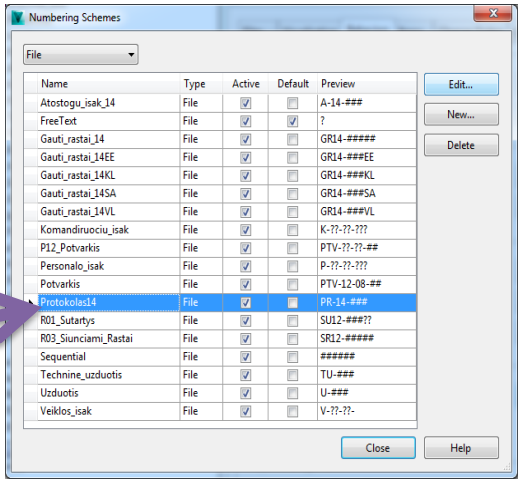
```
Folder[] folders = null;
Folder folderis = null;
Cat[] failoCats = null;

    folders = m_serviceManager.DocumentService.GetFoldersByFileMasterId(selectedFile.MasterId);
    folderis = folders[0];
    failoCats = m_serviceManager.CategoryService.GetCategoriesByEntityClassId("FILE", true);

    foreach (Cat failoCat in failoCats)
    {

        DialogResult result = MessageBox.Show("Ar failui " + selectedFile.Name + " suteikti  kategoriją "
            + failoCat.Name + " kaip ir katalogui į kurį keliate failą ?",
            "Automatinis kategorijos priskyrimas", MessageBoxButtons.YesNo);
        if (result == DialogResult.Yes)
        {

                m_serviceManager.DocumentServiceExtensions.UpdateFileCategories(new long[] { selectedFile.MasterId },
                    new long[] { failoCat.Id }, "Priskirta failo kategorija pagal kataloga");
                break;

        if (result == DialogResult.No) { break; }
    }
```

Auto file naming scheme assign by category

On File rename Auto selecting file naming scheme by category or/and file path



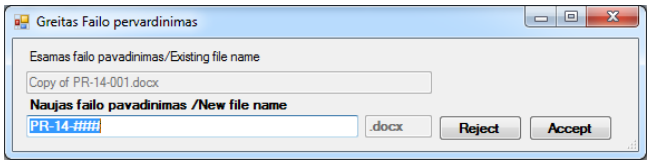


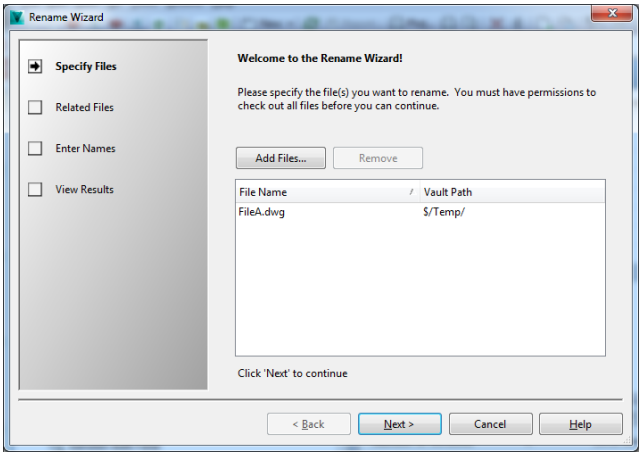


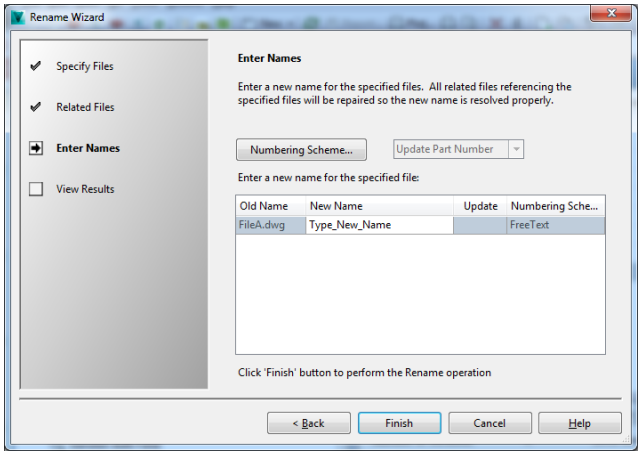

```
if (selectedFile.Cat.CatName == "V_GAUTAS_RASTAS" && folderis.FullName.Contains("Kaunas")) { ShemeName = "Gauti_rastai_14"; SchemosPr = "GR14-#####"; }
if (selectedFile.Cat.CatName == "V_GAUTAS_RASTAS" && folderis.FullName.Contains("Klaipeda")) { ShemeName = "Gauti_rastai_14KL"; SchemosPr = "GR14-###KL"; }
if (selectedFile.Cat.CatName == "V_GAUTAS_RASTAS" && folderis.FullName.Contains("Siauliai")) { ShemeName = "Gauti_rastai_14SA"; SchemosPr = "GR14-###SA"; }
```

When the system contains a number of File Numbering Schemes, selecting file names from a long list can become awkward. This selection can be automated through programming to choose the scheme according to the category assigned to the file and the location of the file.

Fast file renaming, all in one step







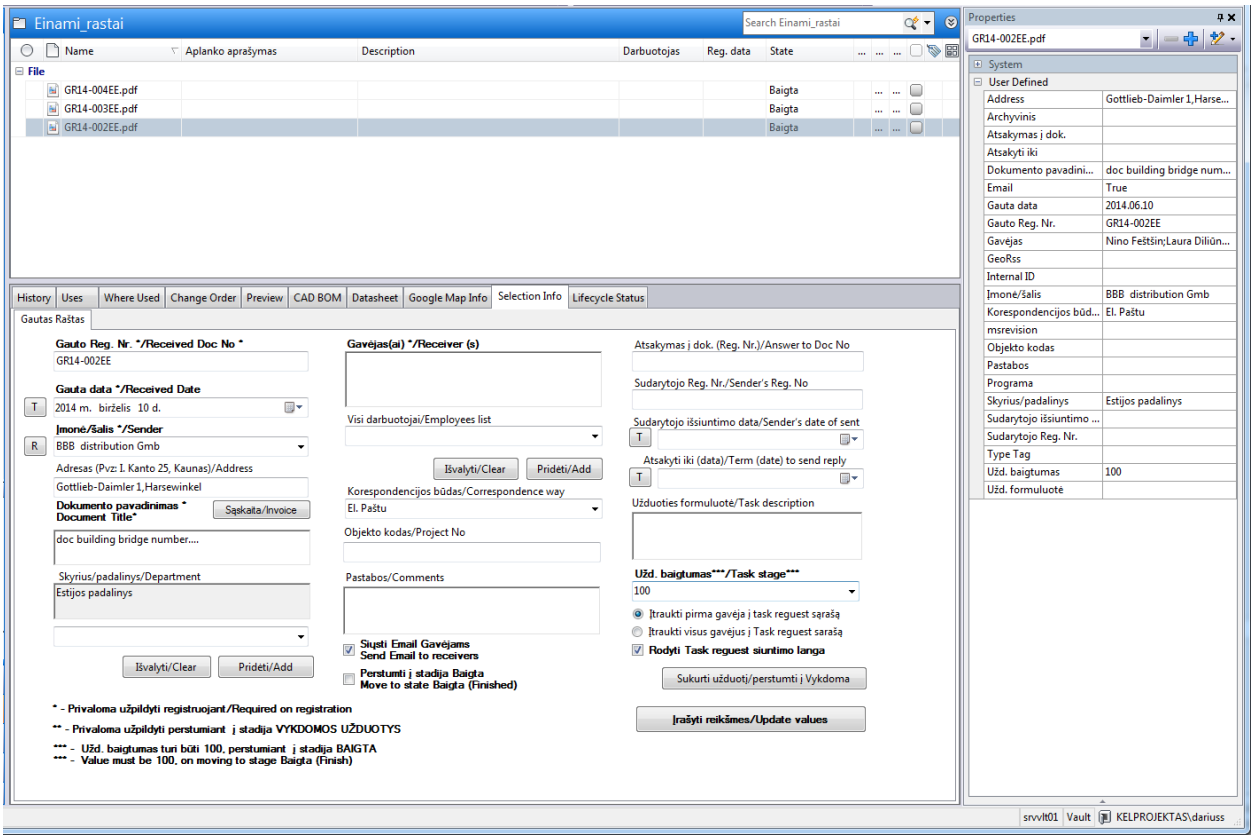
Files are renamed in a single window and with a single mouse click.

In order to rename the file, the user does not have to be authorised to delete it.

When the file is renamed, the application uses a system user with administrator rights. The name of the user who initiated the changes is noted in the comments.

```
User useris = null;
useris = m_serviceManager.AdminService.GetUserByUserId(mUserId);
Coment = "Failo pavadinima pakeite " + useris.FirstName + " "
    + useris.LastName + " " + useris.Name + " Buves pavadinimas " + selectedFile.Name;
File checkedOutNewFile = CheckOutAdmin(folders[0], selectedFile);
if (checkedOutNewFile != null)
{
    CheckInAdmin(folders[0], checkedOutNewFile, newname, Coment);
}
```

Attribute filling forms; automation

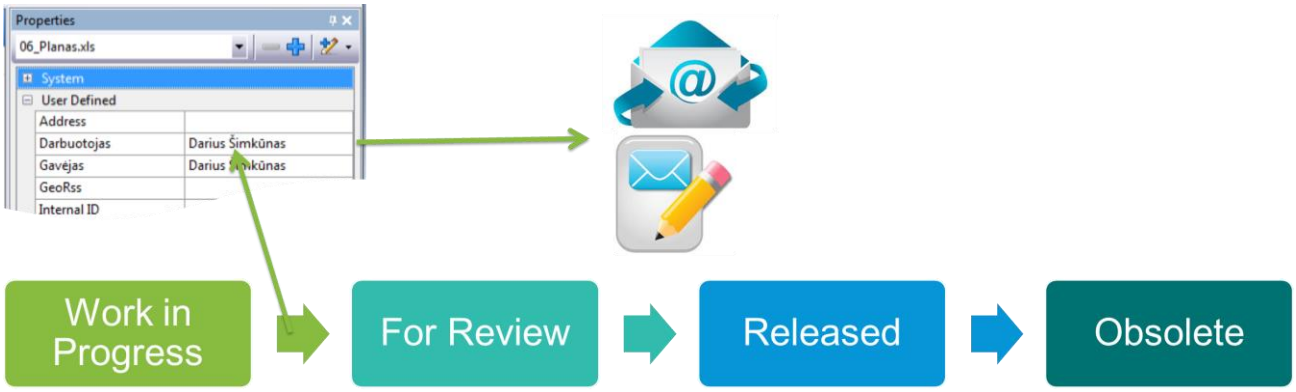


- More user-friendly and automated filling of attributes.
- Integration into existing databases.
- Automated Lifecycle management.

```
var context = new SP.ClientContext("https://kelprojektas.sharep
context.Credentials = new SP.SharePointOnlineCredentials("user@
string listName = "moni sraas";
SP.Web web = context.Web;
IEnumerable<SP.List> existingLists = context.LoadQuery(
        web.Lists.Where(l => l.RootFolder.Name == listName));
context.ExecuteQuery();
SP.List list = existingLists.First();
var query = new SP.CamlQuery();
SP.ListItemCollection items = list.GetItems(query);
context.Load(items);
```

```
if (m_selectedFile.FileLfCyc.LfCycStateName == "Registruojamas" && GRStadBaigta.Checked==true)
{
    if (Uzbaigt.Text == "100" && GautRegNr.Text.Length > 5 &&
        Imone.Text.Length > 1 && GautaData.Text.Length > 2 &&
        DokPav.Text.Length > 1 && GavejaiList.Text.Length > 5)
    {

        mm_serviceManager.DocumentServiceExtensions.UpdateFileLifeCycleStates(new long[]
        { m_selectedFile.MasterId },
        new long[] { 34 }, "Automatinis perstumimas į Baigtą stadija");
    }
```

E-mailing system



E-mailing is just one of the potential uses of the Job Server.

SDK enables creating specific tasks for the Job Server. The range of potential uses here is truly wide: You can read all information on the file moving from one stage to another, and see from which stage to which stage the file is sent. With this information you can carry out specific tasks, e.g. send individualised messages, etc.

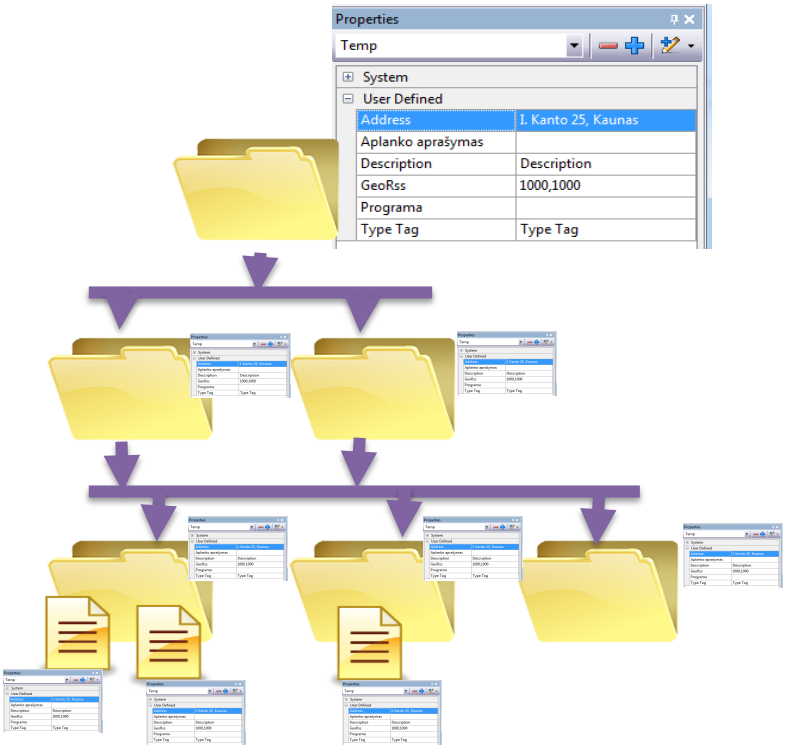
File, folder attribute copy

When a project is created in Vault, attribute information has to be filled out. Nobody wants to repeat this with every file and catalogue inside the project. Additional functionality for copying attributes was created to optimise the process.

The application copies selected attributes to the below catalogues and/or files with matching attributes.

We can specify how deep into the catalogue structure the attributes should be copied; fill out only empty values; or overwrite.

The application can copy file attribute values to the catalogue that contains the file.

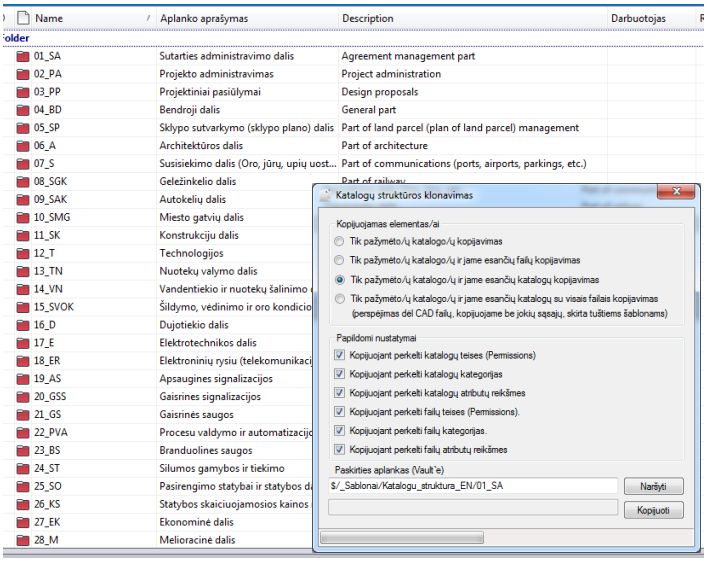


Clone Folder structure

Creating new projects should be fast and convenient. Creating catalogues in Vault, attributing categories, setting user rights on an individual basis takes too much time. When a pre-set catalogue structure is imported from a standard Windows catalogue, we can automatically assign categories, but access rights and attribute values remain unassigned.

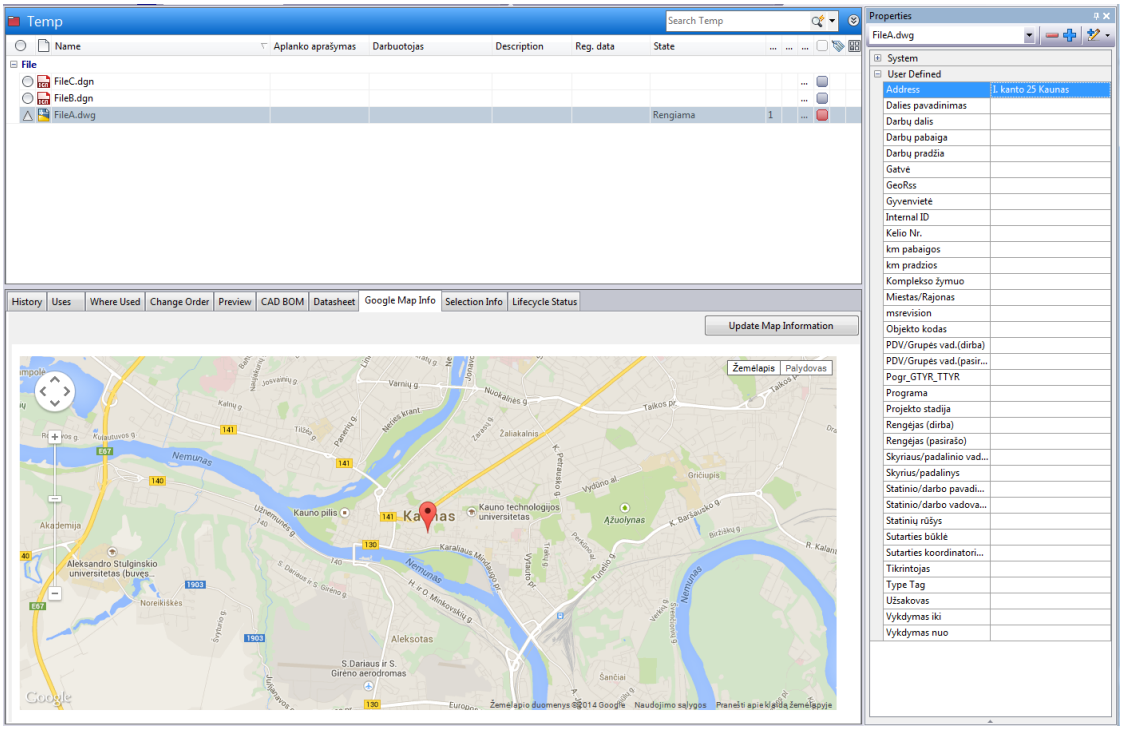
JSC Kelprojektas has a template with all possible project parts, pre-set access rights, and partially filled out attribute values.

Additional application copies catalogues from the template together with pre-set categories, pre-filled attributes, and pre-set user rights.



Google Map info (Doug Redmond)

The application shows locations of catalogue(s) or file(s) according to the address or Geoross coordinates.

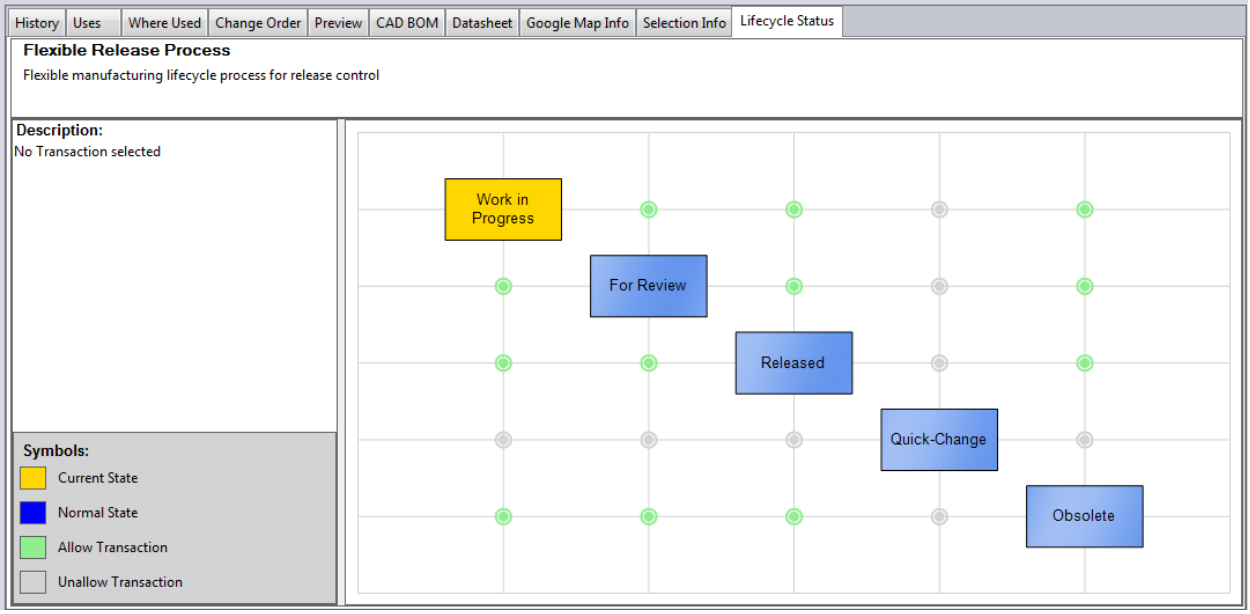


This application with the source code can be downloaded from:
http://justonesandzeros.typepad.com/blog/2011/03/google-map-extension.html

Lifecycle status (Doug Redmond)

Lifecycle enables viewing all stages in a single place, which helps users understand what is going to be done with the selected file of catalogue. The user receives information on possible actions – to which stage the file can be moved, and what stages are restricted.

This additional application with the source code is also available from Doug Redmond's website. Access to the source code enables customisation of the application according to individual needs.



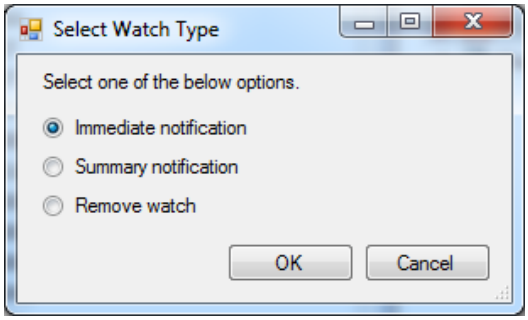
Additional functionality:

- Writing comments when moving from one stage to another;
- Messages on how and what attributes have to be filled out when moving from a certain stage to another certain stage;
- Listing stages in a specific order in the Description field.

This application with the source code can be downloaded from:
http://justonesandzeros.typepad.com/blog/2011/03/visual-lifecycle-status.html

Watch folder (Doug Redmond)

This application allows tracking the status of the selected catalogue(s). Receiving notices on when the file was uploaded or modified and by whom. The application can send notices on changes immediately or as daily reports.



The format of the notice can be configured by the user according to his/her needs.

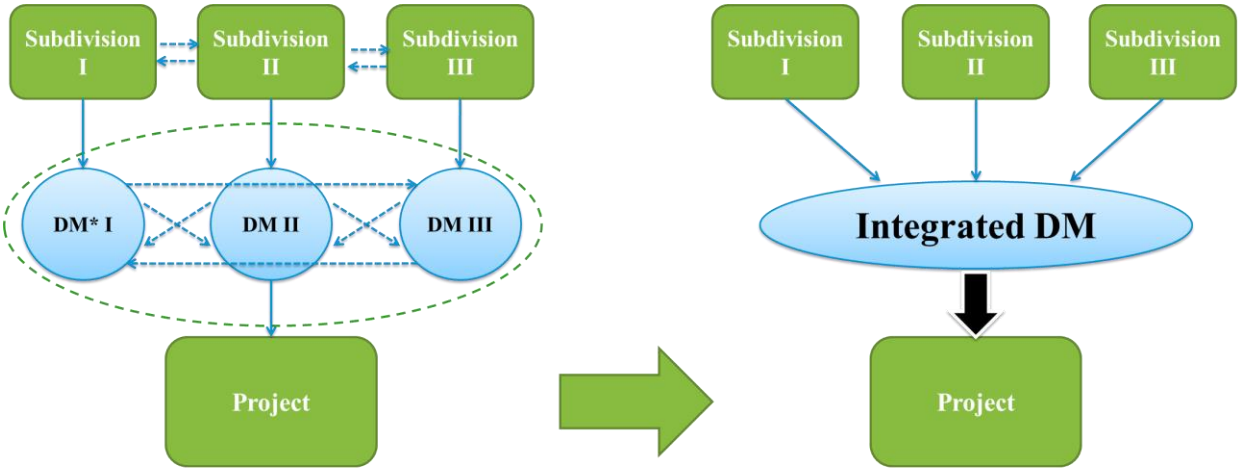
This application with the source code can be downloaded from: http://justonesandzeros.typepad.com/blog/2012/05/q-tools-and-watch-folder-2013.html

From: Vault@kelprojektas.lt [mailto:Vault@kelprojektas.lt]
Sent: Tuesday, September 30, 2014 9:44 AM
To: Darius Šimkūnas
Subject: Failai prideti/atnaujinti Vault

Nauji failai buvo įkelti arba atnaujinti (checked-in) Jūsų Vault watch kataloguose.

DiegimoPlanas.mpp
$/_Vault Diegimas/Diegimo_Grafikas/DiegimoPlanas.mpp
Checked in by: KELPROJEKTAS\dariuss
Check in time: 2014-09-30 09:43:06

Summary



a. Situation before Vault

b. Present situation

*DM – digita model

Before the installation of Vault, our company had different teams working on different parts of the project. Now we have one cohesive team of different professionals working on a single project and aiming for a single goal.