

# ecReport: a collaborative web tool for reporting R&D projects

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**Producing periodic progress reports of collaborative R&D projects is usually a tedious, error-prone and costly task that is mainly performed combining a set of isolated tools and manual processes. We present the ecReport system, which is a configurable reporting tool that is especially focused in collaborative EC-funded R&D projects, although it can be used for other purposes. This tool is based on the use of ontologies about different aspects of this type of projects (people, organisations, deliverables, etc.), and gives full support to the acquisition of data for periodic project reports and to the generation of reports from this data, and allows publishing this data in open formats like RDF.**

## 1. Introduction

R&D projects usually require the creation of periodic project progress reports that project coordinators can use to monitor the project, including the progress towards the objectives and the consumption of effort and budget. In the cases of publicly-funded projects, such as in R&D projects funded by the European Commission (EC), these progress reports must be also sent to the corresponding project officers or other contact points at public administrations at regular intervals during the project execution.

Depending on the systems used for reporting and tracking progress, this task may be more or less tedious to be done. Different types of organisations approach this task in different ways, from manual to fully automated processes that cover different aspects of the reporting activities. However, this is even more complex in the case of collaborative projects that involve teams belonging to geographically distributed organisations, with different accounting and reporting systems and different persons assigned to this task. This is again the case of EC-funded R&D projects.

In this setting, the task of preparing a periodic progress report has traditionally consisted of the following steps (executed by the project coordinator):

- Request progress reports from each of the partners involved in the consortium.
- Receive the partial progress reports and compile all that information in a single document, removing duplicates, detecting inconsistencies, etc. This step is performed iteratively until all the information is provided.
- Prepare a final summary, stressing the most important aspects of the results.

According to our experience in this type of projects and considering reporting periods of six months, this task usually requires one person-month from the project coordinator for every report and from three person-days to around ten person-days for every partner involved in the project, what makes a total average effort of three person-months for a small project of 6 partners, involving a number of roles in each organisation (from administrative people to highly-qualified R&D personnel)<sup>1</sup>.

To help minimise the effort required to collect and publish the required data, and increase the quality of the

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<sup>1</sup> These figures are based on data recorded for 10 EC-funded R&D projects in the last ten years.

data presented (e.g., by reducing inconsistencies due to some of the manual processes involved in this task) we developed a web-based edition tool (ecReport) that allows the project consortium to edit collaboratively a large number of sections from project reports, with a special focus on those that need the collaboration from most of the partners in the consortium.

Furthermore, in many situations these periodic reports have to be compiled together and summarised into other periodic reports that contain several basic periods (e.g., yearly reports), and some reports need to include consolidated figures from the previous ones (e.g., total effort consumed since the beginning of the project). While this is not a complex task if the appropriate tools are used (e.g., good spreadsheets, appropriate progress tracking tools, etc.), in many occasions the relationship between the information contained in these tools and the information finally presented in the report document is lost, and data can be inconsistent, what requires again a process of double checking all figures in several systems.

To help with this task, our system generates automatically these reports, so that the document version will be always reflecting the actual data that is available in the system and it will be easier to combine and consolidate data from previous reporting periods in a single tool, and combines reporting data with other relevant data from the project, such as project participants, events, documents, deliverables, organisations, etc., what can be used to connect the external web site of the project with the internal reporting tool, avoiding duplicating the work to be performed to maintain their consistency.

Finally, our system exports all the information that it contains in the RDF format, according to a set of extensible knowledge models described in RDF Schema. The main advantages of these formats is that all this information can be easily exploited by other tools that may have access to all or only part of the information, and that the aspects to be recorded and reported can be extended and customized more easily.

In this paper we start describing the usual structure of a periodic progress report for an EC-funded R&D collaborative project, and the functions that are provided in the system to acquire data and generate reports. Then we describe the information model used in ecReport, which is implemented by a network of five ontologies. Later we describe the different types of ecReport users (roles) that have been identified and that are used in the system, and describe how each of these users can perform different functions in the system. Finally we describe how the system allows the replanning of the work to be done (and for which reports will be generated) and how it can be customised.

## 2. A sample R&D project periodic progress report

In this section we provide a template with the usual

structure of the periodic progress reports that ecReport gives support to. This structure is mainly based on the one followed for reporting projects of the Sixth and Seventh EC Framework Programmes (FP6 and FP7).

Reports are normally divided in two sections, one that describes the report of scientific and technical activities performed in the period covered by the report, and another one that contains mainly administrative and management information.

Taking this into account, the usual structure of a report is as follows:

1. Activity Report
  - 1.1. Report on Workpackage (WP) activities.
  - 1.2. Publishable executive summary.
  - 1.3. Update plan for using and disseminating knowledge.
  - 1.4. Dissemination: publications, invited talks, organized workshops and conferences, etc.
2. Management Report.
  - 2.1. Financial statement.
  - 2.2. Summary financial report consolidating the costs of contractors.
  - 2.3. Audits certificates.
  - 2.4. Brief description of the work performed by each contractor during the period.
  - 2.5. Budgeted cost and actual costs.
  - 2.6. Budgeted person-month and actual person-month.
  - 2.7. Summary explanation of the impact of major deviations from cost budget and from person-month budget.

In some specific cases there are also other types of information that are covered by these reports, such as the distribution of EC funding to partners and any other interim reports that may have been requested by project officers.

The current version of ecReport gives support to the full Activity Report and to a large part of the Management Report, except for the financial statements and audit certificates, which is something that we are working for the following releases.

## 3. ecReport Information Model

The information model of ecReport is based on a network of five ontologies. An ontology is defined [1] as a “formal explicit specification of a shared conceptualisation”, which means that it is described in a formal language (e.g., RDF Schema or OWL, which are Semantic Web languages), that all its components are explicitly defined, and that it models a view of a domain that is common for a group of people.

This information model has been derived from our experience in the development of Semantic Web portals for R&D projects (Esperanto, KnowledgeWeb, OntoGrid, etc.), and from our knowledge of the domain of R&D project management and execution. Figure 1 presents an

overview of these ontologies and of the relationships between them. They are described in more detail in [2].

Now we describe the purpose of each ontology and the type of information that it models:

- The **Documentation Ontology** models knowledge about the documentation used in the project. This includes technical and administrative reports created in the project (this includes the progress reports created with this system), all types of papers that are created as a result of it, thesis, etc.
- The **Event Ontology** models knowledge of events that are related to the project, either because they are organised by members of the project (conferences and workshops, etc.), because they are related to the project execution (project meetings, reviews, etc.) or because they are somehow related to the work done in the context of the project.
- The **Organization Ontology** models knowledge of organizations that work in the project. The most important information about organizations working in a project is related to the organization itself (such as, name, acronym, logo, etc.) and to its location (i.e., country, street address, etc.).
- The **Person Ontology** models knowledge of persons who work in the project. The person ontology is focused on general-purpose personal information, plus sets of categories of the persons inside the organisation and in the context of the project.
- The **Project Ontology** models information about the description of work of the project, including information about milestones, workpackages, tasks, reporting periods, etc. Hence this ontology is extremely relevant for the generation of the activity and management parts of the report.

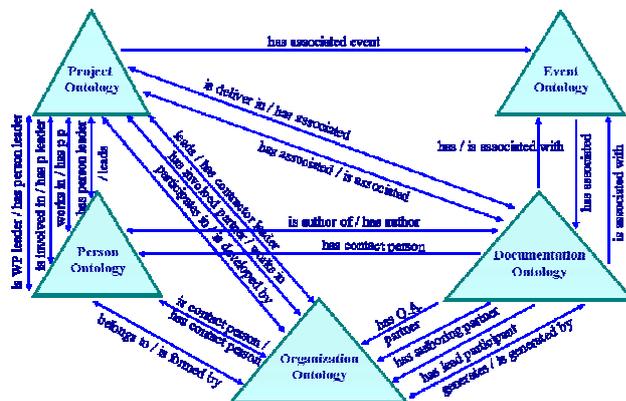


Figure 1. ecReport predefined ontologies.

All these ontologies can be retrieved from any of the aforementioned project web sites, where they are being used not only for reporting purposes but also to organise all the information presented in them.

#### 4. ecReport users

ecReports manages different kinds of users that follow certain roles in the creation of the Activity Report (plus in

the creation of other types of contents in the corresponding web site). The ecReport roles are:

- **Workpackage leader.** The user of this type of role is bounded to the responsible person of a workpackage. The main responsibility from this type of user in the Activity Report is to enter the inputs to the Report on Workpackages activities (task 1.1).
- **Partner.** The user of this role is usually bounded to a person responsible of an organization in the project consortium. The main responsibility from this type of user in the Activity Report is to enter the inputs of the actual effort spent in a specific reporting period (tasks in section 2).
- **Managing Director.** This type of user is in charge of monitoring the status of the progress report and compiling the different sections of the report in an editable document.
- **System Administrator.** This is a special user that has permission to access all data in the server and has access to the administrator functionalities, such as generation of user profiles, rights, etc.

To specify that a user belongs to a specific organization, ecReport allows the system administrator to edit the user profile linking a user to an organization, which is another piece of data inside the system.

#### 5. Activity and Management Reports

According the different types of system users, ecReport allows the collaborative edition of the Activity and Management Reports, the monitoring of the reporting progress and the generation of an editable version of the document in MSWord and in HTML.

##### Report on WP activities

When a WP leader user logs into ecReport, the system shows the list of WPs led by the user and which of them do or don't have a report in the current reporting period. If the user wants to report the work done in the WP, the user can fill in a form with an overview of the work done, a description of the work done in the deliverables, meetings done about the work in the WP and if the user has or plans to have delays in the WP (see figure 2).

Figure 2. Edition of a WP progress report.



database, but the schema and the information is not accessible from outside the application. In order to enable the development of client applications for other purposes (e.g., creation of other kind of internal reports, management of several projects at once, etc.), ecReport exports the information in RDF [3] and the ontologies in RDFS [4] and OWL [5].

## 6. Description of Work Updates

During the execution of a project there is another time consuming task of all partners in the consortium: the updates of the description of work (DoW, also known in EC projects as Joint Programme of Activities, JPA).

This task involves all partners in such a way that they have to update/change the description of the project at the end of specific periods defined at the beginning of the project. This task has the objectives of reviewing the general project description, the list of tasks, the milestones and the deliverables of the WPs, the distribution of efforts, etc. That is, an update of description of the whole project.

ecReport also helps in this task, by taking the inputs from different partners in a collaborative way. This task involves the following subtasks: update of the whole description of the WPs (objectives, plans, results, deliverables, and tasks) and the new distribution of efforts.

### *Effort distribution*

Each partner can modify the efforts that the partner will spend during the next reporting period among the different WPs in the project. This redistribution of efforts will be reviewed by each WP leader and by the managing director, so that they can request that partner to change them.

### *WP description*

Each WP leader can update the description of the WP, changing the objectives, results, number of deliverables, list of tasks and list of milestones.

Also, the WP leader can monitor the distribution of effort from all partners in the WP in order to see who has already submitted the effort and how much effort a partner is planning to spend.

### *Compiling the document*

At the end of the period for updating the DoW, the managing director can request a compilation of all inputs from all partners to generate a document with: a table of deliverables, a list of all WP descriptions, a GANTT diagram with all tasks from WPs and a table of distribution of effort from all partners among all WPs.

### *Mailing System*

As the mailing system used for the Activity Report, this

mailing system notifies all partners when the DoW update process starts and when a stage of the period starts (submission and revision of efforts, submission and revision of the WP description, etc). Also, when a partner submits a new distribution of efforts or makes any changes on them, the mailing system notifies each WP leader of the efforts that the partner has submitted, so that the WP leader always knows the current status

## 7. ecReport customization

ecReport stands out in its easy adaptation to project characteristics. Each project can have individual personalization from the basic reports, ecReport can be customized to manage this personalization in a very easy and fast way. ecReport has supported projects with different kinds of reports, new project characteristics like WP areas, new tables in the reports, etc.

These changes are done in the ontologies adding new concepts, new attributes, etc., but keeping the core ontologies intact, so that all client applications can still work independently.

## 8. Conclusion

ecReport has been developed to support and assist in the generation of activity reports for R&D collaborative projects, making easier in this way the generation of the reports and the monitoring of reports, avoiding missing formats in documents, missing the latest versions of a section, and mismatching between information in different sections in the document.

ecReport has been successfully deployed in several EU R&D projects, such as: Knowledge Web Network of Excellence, Esperanto, OntoGrid, NeOn, and XMedia.

## 9. References

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