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**MANAGING DOCUMENTATION IN AN  
INTERNATIONAL IT PROJECT ON THE EXAMPLE  
OF BALTICMUSEUMS 2.0 PLUS**

**Abstract**

Managing documentation in projects involving software development is a complex task, even more when done within frames of a European co-operation programme. This paper lists types of documentation that one has to deal with in such a project and describes a set of solutions that make it feasible to effectively manage and exchange this documentation. The paper is based on experiences gained during the progress of the BalticMuseums 2.0 Plus project, where the solutions described here were positively verified in practice.

**Introduction**

The realization of any project results in a considerable amount of relevant documentation. Although it is seen by many as a burden, there are many reasons that make project documentation an item of top importance<sup>1</sup>:

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<sup>1</sup> Compare: J. Rakos, K. Dhanraj, S. Kennedy, L. Fleck, S. Jackson, *The Practical Guide to Project Management Documentation*, John Wiley & Sons, Hoboken, USA, 2005, p. xiii.

- documentation is the only project result until the product is finished,
- producing certain documents can be a major milestone in early project phases,
- documentation drives the project, as it defines tasks and schedules,
- documentation organizes the project, as it defines work breakdown structure and responsible parties,
- documentation helps to keep standards within the project,
- documentation serves as a formal communication channel, both inside the project team and with other stakeholders,
- documentation stores the project knowledge, which is especially valuable in case of personal rearrangements.

There are kinds of projects in which proper documentation is especially important. One such kind are information technology (IT) projects, especially involving software development, due to its complexity<sup>2</sup>. Another such kind are European co-operation projects, as their progress is under continuous monitoring of the programme managing authorities, which requires adequate level of reporting and sustaining detailed documentation of project activities. One can conclude that a project that is both an IT and European co-operation project can provide interesting observations on project documentation and its management.

In this paper, the BalticMuseums 2.0 Plus project has been chosen to serve as a case study. We start with a short description of this project, following it with investigation of types of documentation in use within the project, and description of measures undertaken and tools used to make this documentation manageable and exchangeable.

## **1. The characteristics and structure of the BalticMuseums 2.0 Plus project**

BalticMuseums 2.0 Plus is an international project realized in the years 2011–2013 within the *South Baltic Cross-border Co-operation Programme 2007–2013* and part-financed from the European Regional Development Fund under the European Territorial Co-operation objective of the cohesion

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<sup>2</sup> B. Golden, *Succeeding with Open Source*, Addison-Wesley, Boston, USA, 2004, p. 147.

policy<sup>3</sup>. This project is a direct continuation of the BalticMuseums 2.0 project realized in the years 2009–2012 within the same European co-operation programme.

The international consortium behind the BalticMuseums 2.0 Plus project consists of two scientific institutions – The University of Applied Sciences in Stralsund and the University of Szczecin, four oceanographic museums – The German Oceanographic Museum in Stralsund, Gdynia Aquarium, Lithuanian Sea Museum in Klaipeda and the Museum of the World Ocean in Kaliningrad, and Klaipeda Tourism and Culture Information Center (an associated partner).

The main aim of the project is the joint development of cross-border tourism information products by South Baltic oceanographic museums<sup>4</sup>. The structure of the project consists of five components: (1) Overall Project Management, (2) Communication & Dissemination, (3) Development of eGuide content, (4) Implementation the eGuide systems in the museums, and (5) Evaluation, Adaptation and Organisational Embedment.

## 2. Documentation of the project

In a project like BalticMuseums 2.0 Plus, which is both an IT and European co-operation project, there are many types of documents in use. Some of them pertain to the deliverables of the project, whereas other pertain to the process of achieving those deliverables. Project documentation may also be divided into internal and external one, depending on whether it is intended for the project team members only (to ensure proper realization of the project tasks) or external audience<sup>5</sup>.

The documentation of the BalticMuseums 2.0 Plus project includes:

- 1) the documents whose creation is due to requirements of the South Baltic programme, which are prepared for the Managing Authority, First and

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<sup>3</sup> K. Muszyńska, Z. Drązek, J. Swacha, *Projekt BalticMuseums 2.0 Plus jako przykład wykorzystania środków unijnych dla aktywizacji międzynarodowego ruchu turystycznego*, „Ekonomiczne Problemy Usług”, 85, 2012, p. 71.

<sup>4</sup> *Project Aims*, BalticMuseums 2.0 Team, 2010, <http://www.balticmuseums.org/project-aims.html>, accessed 30.06.2012.

<sup>5</sup> Compare: S. Purser, *A Practical Guide to Managing Information Security*, Artech House, Norwood, USA, 2004, p. 133.

- Second Level Control, or Lead Beneficiary<sup>6,7</sup>, such as Progress Report, Shared Costs Template, Project Spending Plan, staff-related documents (Employment contract, Payment proofs, Time sheets), and travel-related documents (Agenda of project meeting, Travel report);
- 2) the documents whose creation is due to internal requirements of the University of Szczecin, such as Monthly Personnel Costs Report;
  - 3) the documents whose creation is recommended by the PRINCE2 project management methodology<sup>8</sup>, such as Acceptance Criteria, Business Case, Communication Plan, Configuration Item Record, Configuration Management Plan, End Project Report, Issue Log, Product Checklist, Project Approach, Project Initiation Document, Project Issue, Project Plan, Quality Log;
  - 4) the documentation of co-operation with external suppliers<sup>9</sup>, including documents related to procurement (Invitation for Bid, Request for Proposal, Request for Quotation, Invitation to Negotiation, and Contractor Initial Response), and contract execution (Contract, Change requests, Acceptance protocol, Seller invoices);
  - 5) the documentation describing methods and processes adopted in the project team work, such as the system development methodology<sup>10</sup> used, as well as manuals for the software tools used by the project team – mostly in a form of procedural help on how to perform specific project-related tasks using those tools, e.g. how to obtain access to the web project management system, or how to publish an article on the project wiki;
  - 6) the documentation of the project team work, including detailed plans and schedules, checklists, task and status memos, minutes of meetings;

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<sup>6</sup> I. Kaniecki, *Introduction and overview on reporting in the South Baltic Programme*, South Baltic Programme Joint Technical Secretariat, 2011, [http://en.southbaltic.eu/files/?id\\_plik=2642](http://en.southbaltic.eu/files/?id_plik=2642), accessed 30.06.2012.

<sup>7</sup> J. Masuch, *Financial Reporting*, South Baltic Programme Joint Technical Secretariat, 2008, [http://en.southbaltic.eu/files/?id\\_plik=197](http://en.southbaltic.eu/files/?id_plik=197), accessed 30.06.2012.

<sup>8</sup> *Managing Successful Projects with PRINCE2*, Office of Government Commerce, London, UK, 2009, pp. 235–262.

<sup>9</sup> H. Kerzner, *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, John Wiley & Sons, Hoboken, USA, 2009, pp. 840–847.

<sup>10</sup> J. Swacha, K. Muszyńska, Z. Drażek, *An outline of development process framework for software based on open-source components*, in: “Proceedings of the 14th International Conference on Enterprise Information Systems”, vol. 2, SciTePress, Wrocław, Poland, 2012, pp. 183–186.

- 7) technical documentation of the delivered product, both for use during development process and for future reference, including system requirements, system architecture and design, description of available functionalities and interfaces, commented source code, test reports, etc.
- 8) user documentation of the delivered product, intended for administrators (installation, configuration and maintenance manual) and end-users (e.g. on-line help).

Notice that the classification of documents presented above is not exclusive; for instance, most of the documents classified as (4) can also be classified as either (1), (2) or (3).

### **3. Making documentation manageable: identification standards, meta-data and workflows**

In order to make the documentation manageable, three things must be defined:

- document identification standards,
- set of metadata that should accompany every document,
- document workflows.

During the progress of the project, documents with same or similar titles, edited by different or even same authors may appear. Therefore, document identification standards should be established, so that every document could be uniquely identified and unambiguously referred to.

The document identification string may be as simple as a consecutive number (referring to the bulk of documents produced within a project) or have an elaborated form that includes information about the document type, author, creation time, etc. As the document identification string should not be too long to remain useful for practical purposes, the information to be included in the identification string should be selected carefully.

If it is important that specific document components (such as sections, figures or equations) could also be uniquely referenced from external sources, adequate numbering schemes should be developed for them, too<sup>11</sup>.

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<sup>11</sup> M.A. Harrison, E.V. Munson, *Numbering document components*, "Electronic Publishing", vol. 4 (1), 1991, pp. 43–60.

The document identification scheme used in the BalticMuseums 2.0 Plus project has the following format:

*Project\_OwnerYear-Number\_Title.Filetype*

where:

- *Project* is the abbreviation of the project name, eg. “BM20plus” for the BalticMuseums 2.0 Plus project,
- *Owner* is the abbreviation of the name of the institution owning the document, eg. “US” for University of Szczecin,
- *Year* is a two-digit year in which the document was created,
- *Number* is a three-digit long number (zero-padded), consecutive for each document created by the owner specified before in the year specified before,
- *Title* is a (possibly shortened) title of the document (with underscores used instead of spaces),
- *Filetype* is a filename extension defining the type of the document.

An exemplary document identification following this scheme is “BM20plus\_SUAS10–002\_KickOff\_Meeting.pdf”. The full identification string is used only for file naming (and therefore, in hyperlinks as well), whereas references within project documents use a short form, consisting merely of the middle part of the identification string: *OwnerYear-Number*, eg. “SUAS10–002”. It is this short form that is referred to as the “document number”.

Having established document identification standard, it is a practical necessity to create a document index and keep it updated until the end of the project. The index does not only provide information on the first unassigned identification number, but also helps to know what documents are already there and thus to avoid creating duplicate documents instead of updating existing ones.

It is sufficient that the index lists only document titles and identification numbers. However the documents themselves may contain additional metadata, so that they could be effectively organized and searched for using various criteria. As there is no universal set of metadata that would serve well in every project,<sup>12</sup> it has to be decided which metadata should be stored with documents in a specific

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<sup>12</sup> M. Baca, *Introduction to Metadata*, Getty Research Institute, Los Angeles, USA, 2008, p. 72.

project. Although there may be numerous types of metadata that are potentially useful, notice that all the selected metadata will have to be specified and kept up-to-date throughout the progress of the project for each project document. Even if some fields are defined as optional, leaving them out is also meaningful. For this reason, in order to minimize the time and effort spent on editing metadata, their set should only contain the most important pieces of information.

In the BalticMuseums 2.0 Plus project, all the working documents are required to have an identification page attached that contains the following metadata:

- 1) document title, e.g. „C2 Concept promotion”,
- 2) project name, e.g. „BalticMuseums 2.0 Plus”,
- 3) document type, e.g. „additional project documentation”,
- 4) current version, e.g. „1.0” for the first release of the first version,
- 5) document number, e.g. „US11–002”,
- 6) project component, e.g. „C2” for Component 2,
- 7) project indicator, e.g. „None” if the document does not contribute directly to any of the project indicators,
- 8) period of retention, e.g. „Until 2020–12–31”,
- 9) storage location, e.g. „<https://files.balticmuseums.org//Documentations>”,
- 10) total number of pages (in the current release),
- 11) author (of the original release),
- 12) date of creation,
- 13) reviewer (of the original release),
- 14) date of review (of the original release),
- 15) approver (of the original release),
- 16) date of approval decision (of the original release),
- 17) amendment (s), specifying the number of amendments made,
- 18) and for every amendment made, the following fields are appended:
  - version (of the amended document),
  - short description of the changes made,
  - affected pages,
  - author of the amendment,
  - date of modification,
  - reviewer,

- date of review of the amended release,
- approver,
- date of approval of the amendment.

Document workflows should be defined, so that every person receiving a document (or being asked to prepare one) knows, without further explanation, what to do and whom to send it to, having finished their own work. The defined workflows are the more useful, the more people are involved in the process of document development. This process does not only cover the preparation of the document structure and content but also its reviewing and approval. Usually the person who makes the request for a document, and then approves it, is not its author, and for the sake of quality and fairness, also the review should not be done by the document author<sup>13</sup>.

Although the workflows should be precise and unambiguous, on the other hand they also have to be simple and general, so that they can be used with various types of documents and with no exceptions.

The general document development workflow used in the BalticMuseums 2.0 Plus project consists of the following stages:

1. A request to prepare a document is received by the author.
2. The author makes an inquiry for any relationship of the document to be prepared, to existing ones, and establishes whether it should actually be a new document or rather an amendment to an existing one.
3. The author prepares a draft of the document.
4. The author checks the draft and corrects all the errors found.
5. The author submits the draft to the reviewer.
6. The reviewer reviews the draft.
7. The reviewer communicates to the author whether the draft is (a) acceptable in the submitted form, (b) acceptable with minor adjustments pointed to by the reviewer, (c) must be reworked (with major changes suggested by the reviewer):
  - a) the draft is passed to the approver;
  - b) the draft is corrected by the author, then passed to the approver;
  - c) procedure returns to step 3.

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<sup>13</sup> P.V. Anderson, *Technical Communication: a reader-centered approach*, Wadsworth, Boston, USA, 2011, pp. 413–414.

8. The approver checks the draft.
9. The approver communicates to the author whether the draft is (a) approved, (b) not approved (with substantiation):
  - a) the draft is registered as the current version of the document;
  - b) procedure returns to step 3.

All the official documentation in the BalticMuseums 2.0 Plus project is in English. This is not the case with every project. Sometimes, translation workflows have to be established, which, depending on circumstances, may significantly complicate the document development process<sup>14</sup>.

#### **4. Making documentation exchangeable: formats, tools and platforms**

Although the most crucial project documentation may have to be stored in paper form for formal reasons, it is much more practical if it is also stored in electronic form, which makes it easier to search and transmit. This is even more important in case of documents that are more or less frequently updated: only an editable electronic form can help avoid writing the same content again and again.

Unfortunately, not only there is no universal document format for different types of content, but even for a single type of content (such as formatted text or spreadsheet), there are usually many competing formats.

Therefore, document formats have to be chosen, so that all the team members involved in development of documentation have no technical problems with browsing and editing the files. Theoretically, this does not impose choosing specific software<sup>15</sup>, still, in practice, such decision could be made as to avoid possible compatibility problems. If commercial software is chosen, it results in additional expenses and may cause problems with third parties involved in project development, that have no access to such software.

In the BalticMuseums 2.0 Plus project, formats compatible with Microsoft Office 2003 Word, Excel, and Powerpoint were chosen for documents that are

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<sup>14</sup> See, e.g.: J. Swacha, K. Muszyńska, T. Komorowski, Z. Drażek, *Development and maintenance of a multi-lingual e-Tourism website on the example of BalticMuseums 2.0 Online Information Platform*, in: *Information Management*, eds. B.F. Kubiak, A. Korowicki, University of Gdańsk, Gdańsk, Poland, 2011, pp. 237–246.

<sup>15</sup> Compare: G.M. Doss, M. Wallace, L. Webber, *IS Project Management Handbook*, Aspen Publishers, Gaithersburg, USA, 2006, p. 63.

in editing process or are supposed to be updated later, but actually no software was imposed, so that team members could use free open-source office suites (such as LibreOffice or Apache OpenOffice) as long as they were able to edit the documents.

In order to attain a unified look of project documents, a set of templates has been prepared for each type of office document, conforming to visual identity of the BalticMuseums 2.0 Plus project (for illustration, Fig. 1 shows an example of a template-defined page header of a project document). The templates define paper format, layout, colours, fonts and text styles, as well as required elements. This way one can easily create a standardized document by simply using a template as its base.

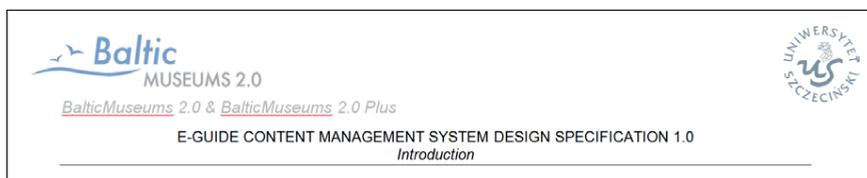


Fig. 1. Example of a template-defined page header

Source: internal BalticMuseums 2.0 Plus project documentation.

As for the ready-to-print documents, Adobe Portable Document Format (PDF) has been chosen to preserve their original look. Nowadays most of the office suites are able to export PDF files; besides, virtual printer drivers (such as PDFCreator) are available that can generate PDF files from any application.

Not every piece of documentation is kept in one of the formats mentioned above. Some kinds of documents (e.g. meeting attendance lists) are kept only in paper form. Most of the documentation preserved on dedicated platforms (see below) was kept as text (formatted or unformatted). Audio-visual documentation (e.g. photographs from meetings) is kept in respective multimedia formats. Also, on-line help has its own, XML-based format. These instances of non-office-type documentation are edited using dedicated software, browser-based in case of web platforms, or specialized desktop applications (e.g. Help&Manual for the on-line help).

There are four main platforms for documentation exchange in the Baltic-Museums 2.0 Plus project: (1) webshares, (2) project wiki, (3) Redmine, and (4) electronic mail.

The webshares (accessed via <https://files.balticmuseums.org>) are used as a document server, uploading to which makes files instantly accessible by other project team members. It is the primary platform for exchange of office-type and audio-visual documentation. What makes it very practical is that webshares can be accessed using any web browser, or even integrated with user's file system as a "network resource" in Windows, or as a "share" in Unix/Linux/MacOS X systems, and then used like a disk drive. Although their primary purpose is an on-line archive for project documentation with long life-span, they are also used for dissemination of large files among project team members, instead of sending them as e-mail attachments.

The project wiki (accessed via <https://wiki.balticmuseums.org>), based on DokuWiki software, is used as a knowledge-sharing platform. The articles published on it include procedural help on various project-related technical tasks (including using the wiki itself), information on workgroups and their members, schedules of workshops and meetings, as well as other short documents – especially those that are being edited in collaboration by many team members, and commented links to resources published on webshares.

Redmine (accessed via <https://redmine.simat.fh-stralsund.de>) is a web-based project management system used to define tasks, schedule them and appoint to team members, report and track issues, notify project management staff on project progress, etc. As such, it stores mainly the documentation of the project team work, and parts of technical documentation of the product being developed.

Electronic mail is used mainly to exchange documentation of small size and very short life-span. Although its use is generally discouraged, because e-mail archive, as a documentation repository, is unreliable, very difficult to manage and results in storage of redundant data, it remains one of primary forms of communication between the project team members<sup>16</sup> and a significant amount of documentation is exchanged this way.

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<sup>16</sup> See: J. Swacha, *An e-mail Exchange Analysis Framework for Project Management Support*, "Business Informatics" 21, 2011, pp. 88–96.

## Conclusions

The set of solutions described in this paper enabled effective management and exchange of various types of documentation during the realization of the BalticMuseums 2.0 Plus international project. The positive experiences expressed by members of the project team suggest that they can be used in other similar projects as well.

As for less documentation-burdened projects, although it may be not justified to copy the set of solutions as a whole, it will usually still be reasonable to use its certain elements. On the other hand, projects with more complex, e.g. multi-lingual documentation, may require extension of the repertoire of methods and tools presented here in order to allow effective management and exchange of documentation.

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## **ZARZĄDZANIE DOKUMENTACJĄ W MIĘDZYNARODOWYM PROJEKCIE INFORMATYCZNYM NA PRZYKŁADZIE PROJEKTU BALTCMUSEUMS 2.0 PLUS**

### **Streszczenie**

Zarządzanie dokumentacją w projektach obejmujących wytwarzanie oprogramowania jest zadaniem złożonym, szczególnie gdy jego realizacja odbywa się w ramach programu współpracy europejskiej. W niniejszym artykule wymieniono rodzaje dokumentacji, które spotyka się w takim projekcie, i opisano zestaw rozwiązań, które czynią możliwymi efektywną wymianę i zarządzanie dokumentacją projektową. Wiedzę zawartą w artykule oparto na doświadczeniach zebranych w trakcie realizacji projektu BalticMuseums 2.0 Plus, gdzie opisane rozwiązania sprawdzily się w praktyce.

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