The Digital Infrastructure of the Pusat Panji and Implications for Similar Institutions: Documentation and Report

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Ini perpustakaan yang tentang Panji. Misalnya, laporan-laporan penelitian dan buku yang terkaitnya akan ditunjukkan dan dikumpulkan di sini.

Sekarang ini, daftar pustaka ini berdasarkan daftar pustaka buku Bu Lydia Kieven (kami mengucapkan terima kasih atas pemberian itu) di sini. Semakin banyak masukan daftar pustaka itu akan ditambahkan ke *database* kami.

Fungsi khusus

Ekspor daftar dalam rtf
    (format kutip Harvard)

Penulis	Judul	Tahun	Majalah/Penerbit	Jenis	DOI/URL	Tempat
van Akkeren, P.	Sri and Christ: A study of the indigenous church in East Java [BibTeX]	1970	London: Lutterworth Press	book		
Aoyama, T.	'Where was the "eastern capital" of Java? Reconsidering the division of Majapahit, 1379-1406' [BibTeX]	1994		unpublished		
Appel, M.	Dewi Sri und die Kinder des Putut Jantaka; Beziehungen zwischen Mensch und Reis in Mythologie und Brauchtum auf Java und Bali [BibTeX]	1991	München: Anacon	book		
Atmodjo, J.S.	'Arsitektur punden-punden berundak di Gunung Penanggungan'	1986		unpublished		

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1. Remarks

Much has changed after almost a year after writing this paper. The organizational structure of the *Pencinta Panji* is likely to change soon. The software ppanji.org was based on, presented here, will soon only exist in an archive. A new system aiming to answer the given challenges is about to be introduced instead. Nevertheless, this paper asks a number of important questions. Certainly, the answers given in this paper are far from perfect, and yet the questions remain:

1. Which software (or which components of a software) are needed by a group like this?

2. How can software programmed with the immediate aim of serving these needs be created with as little expertise and work as possible?

3. How can a digital infrastructure be conceptualized to help a group that is largely unrelated to ICT and does neither have a focus on nor the resources to learn more?

4. How can this software be created to be as cost-effective as possible, without requiring the use of even basic data storage options such as conventional database systems?

The late publication of this paper aims to document these basic problems and an early phase in the process of finding a long-term solution. It is thus to be seen as a contribution to an ongoing debate rather than an answer to it.

2. Introduction

Given today's rapidly emerging technological possibilities, a whole range of new opportunities arise to organizations of all kinds. If an organization wants to keep growing and promote its objective successfully, it has become as good as essential to set up a sufficient digital infrastructure, both for a) representing the organization as well as for b) communication within the organization.

Along with the aforementioned new possibilities and chances, new problems arise, most prominent of which are surely the limited experience with free hard- and software and limited expertise in terms of ICT (Information and Communication Technologies) overall. Whereas larger companies and organizations that are subsidized by their respective governments do not face problems of funding for e.g. software and can thus also avoid most problems caused by missing expertise within the organization by ordering external experts, newly founded and small, less well funded organizations more generally have to find a way facing these problems to not be left behind in the global shift to the internet. Especially in countries like Indonesia, where public funding is harder to find than in countries like the U.S., Japan and Western European ones, these problems are all the more apparent.

Based on the experiences of the *Pusat Panji* (Panji Center), a newly founded cultural advocacy and research institution in Indonesia, this paper is aimed to fulfill three roles: more general considerations are formulated and discussed in terms of the requirements which are encountered by the Pusat Panji when setting up their digital infrastructure to develop a framework to embrace the chances of the digital age. Second, it is written to be a report for affiliates and supporters of the Pusat Panji, and finally, it is written to be a guide for the use and further development of the proposed infrastructure.

Whereas the first part of this paper accordingly describes the needs and limitations the Pusat Panji faces in creating its digital infrastructure, a second part proposes answers for the questions raised in the first part. Here, more technical details are discussed where need be. Finally, a user-centered introduction and guide to the proposed solutions is presented in the last part.

3. The Case of the Pusat Panji

1. WHAT IS THE PUSAT PANJI?

To understand the background, needs and limitations set upon the Pusat Panji, it is necessary to learn about what the Panji stories and Budaya Panji actually are. A brief overview will thus be provided first, including information situating Panji within the broader context of Indonesian cultural heritage politics, before the concrete idea of the Pusat Panji will be discussed, also just briefly. The final subsection identifies aspects that can benefit from an enhanced digital communication and representation.

In ancient Hindu-Buddhist Javanese culture, there are three major epics around which the most present aspects of the culture revolve: the Mahabharata, the Ramayana and the Panji stories. Much more present in modern day discourse on the time, the Mahabharata and the Ramayana tell about Hindu deities. Both stories are rooted in India. Contrastingly, the Panji stories tell the tale of two aristocratic lovers who get separated and need to overcome a number of challenges to find a way back to each other. Thus the actual content of the stories is to be seen as closer to the people, and symbolizing, among others, "(k)esederhanaan … (k)eadilan … (k)esabaran" (Down-to-earthness, justice, patience).[1] Additionally, the stories are original Javanese creations, also in strong contrast to the originally Indian Mahabharata and Ramayana.

So far, the Panji stories have been little represented in the state's discourse on ancient Javanese Culture. This may be a consequence of the geographical dimension of ancient Javanese culture: whereas the Mahabharata and the Ramayana are also represented in Middle Javanese temple complexes, like the most famous and touristically used Borobudur, the Panji stories are distinctly East Javanese. Because of the absence of prominent touristic sites of cultural heritage like Borobudur in the region, the Indonesian state has so far had no special incentives to emphasize aspects that are special to this area.

While there has thus been little attention from the government's side, the Panji stories have been (re-)discovered by artists, researchers etc. Especially in the last five years, Panji related groups and events have gained momentum in different cities, even if so far there has been little coordination between the various activities.

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[1] Lydia Kieven, *Pertemuan Pencinta Panji*, Unpublished invitation letter (2014), 4

On the 12th and 13th of September, 2014, a conference titled *Pertemuan Pencinta Panji* (Meeting of the friends/lovers of Panji) was held in Trawas, East Java, Indonesia with the aim to coordinate existing efforts to promote knowledge of the ancient Javanese Panji stories and *Budaya Panji* (Panji Culture). During this Pertemuan Pencinta Panji it was concluded that to coordinate the existing groups more effectively, an organizational structure needed to be set up with the new Pusat Panji as its main coordinating body. Aside from networking, the Pusat Panji's functions, in close cooperation with its affiliates, include collecting data, conducting research and developing frameworks for educational activities revolving around the topic.

Another related decision of the Pertemuan Pencinta Panji was that a website was to be created to document the activities of the independent groups and support them by providing background information. Both parts of the Pusat Panji's (digital) infrastructure will be managed by the coordinator of the center.

2. ASPECTS THAT DEMAND AN EFFECTIVE DIGITAL INFRASTRUCTURE

1. Organization and inner-group communication

Since the individuals and groups affiliated with the Pusat Panji are spread all over East Java, some even coming from abroad, it was concluded that a system for effective and fast communication via the internet had to be established.

A mailing list or message board is necessary to give a structure ensuring fast discussions among the members and affiliates of the Pusat Panji. In setting up one, it is necessary to use specialized software to prevent single members being left out of long lists of recipients by accident or similar issues as was the case with previous mailing lists. As some sort of digital communication is part of the everyday life of all affiliates, a common ground had to be found in regards to which software or service was to be used.

Additionally, it was decided, that another feature beneficial to the Pusat Panji would be a newsletter to provide summaries of the discussions to the groups as well as the wider public. This decision has since been under revision.

2. Website

As determined during the preparation of the Pertemuan Pencinta Panji, there are a number of different aspects of the Panji stories and Budaya Panji to be identified (see box 1).[2] Whereas for example "Spirituality" is certainly hard to promote via technology, most of these aspects can at least indirectly benefit from a wider digital infrastructure, both for inside coordination as well as for representation to the outside.

First, it needs to be asked who the general target audience might be. Obviously, the largest group of the audience are people generally interested in

> **Literature** (Ancient Javanese literature/Fairy tales)
>
> **Ancient Javanese Art**
>
> **Art & Performance**: Wayang Krucil / Beber / Topeng / Jantur / kreasi baru
>
> **Fertility & Agriculture**: Sri - Sadono
>
> **Spirituality**
>
> Research**:**
>
> **Panji in Java and Beyond** (Cambodia, Thailand etc.)
>
> Application**:**
>
> **Education**
>
> **Tourism**

Box 1

Javanese culture or more deeply interested in further researching Panji. This group ranges from researchers and students to Javanese interested in a largely overlooked aspect of their cultural heritage to tourists - an important factor in the coordination of affiliates like museums and entrepreneurs.

Whereas tourists and generally interested people make an English language version and a well done design of the website a requirement, students and researchers make for a need for well gathered and listed data that makes the topic more accessible for them. Especially for students, accessibility may form the decisive incentive to research Panji instead of other topics for their papers.

In practice, given the aspects pointed out in Box 1, this means:

- A freely accessible bibliography of published ancient Javanese literature and modern-day research papers
- Also promoting research is a publication platform, where the work of the Pusat Panji and its affiliates can be published
- There is already a large and ever growing number of records of performances which can be catalogued and linked to appeal to the general public's interest and promote tourism in the given areas

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[2] Information in the box: Translated from Lydia Kieven, *Pertemuan Pencinta Panji*, Unpublished invitation letter (2014), 4

- ancient Javanese art and other related objects can likewise be digitized for the same aims, under addition of the conservation of its data as a further aim
- an index of the groups working on the topic can be provided, to link the interested audience easily with the given groups
- a calendar can be offered to both external and internal or affiliated users for keeping track of events and reports of past events

4. Problem

As described above, the Pusat Panji does not have extensive subsidies or other sources of funds permitting it to hire external help in ICT. Being a culture-based project, the majority of members and affiliates does not have extensive experiences with ICT, while the different members use different programs for the same tasks or different operating systems altogether.

Another problem is that, given the comparatively slow internet connection available to most users in Indonesia, website designs need to be considered to minimize traffic and be loadable fast.[3]

As described above, an English version of the website is necessary, while if ever possible a way needs to be found to prevent a need for the translation of every entry and all information on there.

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[3] For example, the World Bank Indicators database lists 15.8 general internet users and only 1.3 fixed broadband subscribers for every 100 citizens in Indonesia in 2013, as compared to 84.0 and 34.58 respectively in Germany in the same year. See: World Bank Indicators, *Internet users (per 100 people)*, http://data.worldbank.org/indicator/IT.NET.USER.P2, accessed on November 13, 2014 and World Bank Indicators, *Fixed broadband Internet subscribers (per 100 people)*, http://data.worldbank.org/indicator/IT.NET.BBND.P2, accessed on November 13, 2014

5. Solutions

In this section I present suggestions for a way to set up an appropriate digital infrastructure for the Pusat Panji. First, I describe the general concept behind building the website and setting up the Pusat Panji's internal communicational structure. In line with this I outline general requirements which all proposed tools need to fit in with in accordance with the problems outlined above. In the subsequent subsections, I explain the concrete functions, proposed methods to edit them and their distinctive features to make the most of the given possibilities.

1. GENERAL THOUGHTS AND REQUIREMENTS FOR SOLUTIONS

To keep the financial burden to the organization as low as possible, it is advisable to only use basic functions available with the most basic (say: cheapest) hosting plans for the website, supplementing these with externally processed information. This means that the website cannot use any of the database systems usually used today, and thus cannot rely on more sophisticated but free CMS (Content Management Systems) like Drupal, Typo3 or Joomla. This is not necessarily bad, as the layout of these software solutions is comparatively hard to adjust and website loading times are saved on more basic, self-programmed pages.

On the other hand, this also means that special care needs to be taken to counter problems of usability with the new system to be used. If possible, no knowledge in terms of programing should be required for editors of the website. If so, only the most basic commands can be asked for if necessary, given that there is sufficient information leading the editor through the process.

Whereas some functions of the website thus need to be programmed specifically for the website, other parts can make use of existing solutions: some external, web-based services, others offline software, with sufficient export functions.

The most general requirements of these external services and programs are again that they must be free of charge and easy to handle. No matter the future executives' abilities in ICT, the workflow should remain useable with as little documentation and training as possible. On the other hand, the programs need to be free to cut costs wherever there is an opportunity, so that available funds can be used for other activities of the Pusat Panji. A third point is cross-platform usability of programs used offline, so that the one editing does not need to settle for

learning the handling of a new operating system in the process of taking up the work just to edit the website.

In cases where a good but comparatively hard to use free software is available that has crucial advantages over more simple solutions and trainers for the respective software are available, this software is nevertheless promoted. Generally, only the proposed service/software is discussed to not overload the text, unless there is a most noteworthy alternative. Even if there are viable alternatives as good as any of the suggested solutions, these will not be discussed in lieu of space and as their number is oftentimes just too high to discuss all.[4]

2. ORGANIZATION AND INTER-GROUP COMMUNICATION

In the initial conceptualization phase, organizing the immediate communication of the Pusat Panji with its affiliates, members and others was based on two functions: First, an online forum for discussions of affiliated individuals and groups and, second, a newsletter to spread news, results of discussions and other information revolving around the topic of Panji. Generally, a mailing list or message board is used for many-to-many communication, whereas a newsletter is used for one-to-many communication. This demands the separation of the functions: Whereas users can answer to mails received via the mailing list or posts on message boards, they cannot do so (at least publicly) in case of mails received via the newsletter.

For both mailing lists or message boards and newsletters, a large number of services are available for free use online already.
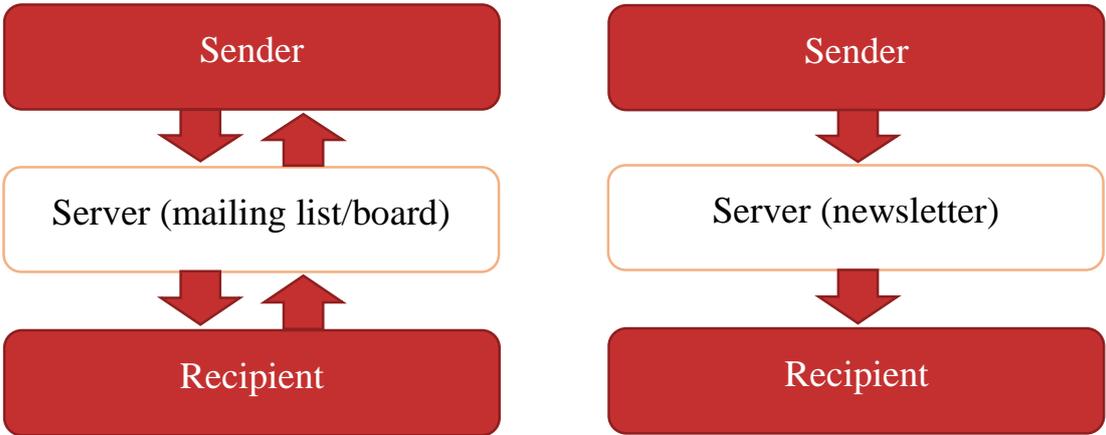

Figure 0-1: Many-to-many communication (left) as compared to one-to-many communication (right)

[4] This is not to be understood as an advertisement for the given services. In many times, other just as good services can be found, the ones proposed are only most viable examples.

1. Discussion Forum

The mailing list serves, as described above, for many-to-many communication among the members. Discussions among members and affiliates need to be done quickly and without technical problems in the sense of hard to use software. Yet, a specialized software is necessary to avoid the problems of previously used mailing lists in the sense of a long list of recipients directly written in the mail's recipient line. An additional requirement is that the form of communication needs to be part of the daily routine of as many recipients as possible.

First failed attempts at solving the problem of which service to use showed that not only own message boards or wikis are unfamiliar, but that emails, too, have become comparatively so.

A more familiar, and thus more effective, working space is Facebook. A Facebook Group was founded for coordination and is indeed much more actively used than previous mailing lists. Issues usually arising from the use of Facebook, like privacy issues do not need to be considered in the case of the Pusat Panji and its affiliates as it deals with no dangerous or secret information.

---- Proposed service/format/tool: Facebook Groups ----

2. Newsletter

It needs to be pointed out that the need of a newsletter has yet to be sufficiently evaluated. As of now, a previously installed newsletter has no outside subscribers who are not in the Facebook group and may thus be abandoned soon. Accordingly, no service or tool is given.

Generally, just like in the case of mailing lists, there is already quite a number of free solutions for the creation of newsletters available on the internet. Unfortunately, most add advertisements, restrict editing possibilities or the number of allowed recipients, unless the user switches to a paid version of the service.

As most self-hosted newsletter systems require a database, a better solution is certainly to use an externally hosted service. To avoid advertisements and the like, using mailing list services (which often do not force advertisements onto free subscribers) and simply disabling users' ability to answer may thus be the cheapest way.

3. WEBSITE AND PUBLIC REPRESENTATION

As pointed out in section 2, the features a website of the Pusat Panji should be have are a calendar, a list with topical media records, a bibliography, a publication platform, a feature to record topical objects (say, statues or reliefs), and an overview of the network of the Pusat Panji. Generally, these features can be categorized by whether external, web-based services can be used or if own functions need to be created. Then, for those cases in which there is no appropriate external, web-based service, the feature can be categorized into either stable, text-based, pages or expandable sets of content to be – in lieu of a proper database system – saved in tables. Finally, a special case, the bibliography can be categorized as using an offline, external program (see below).

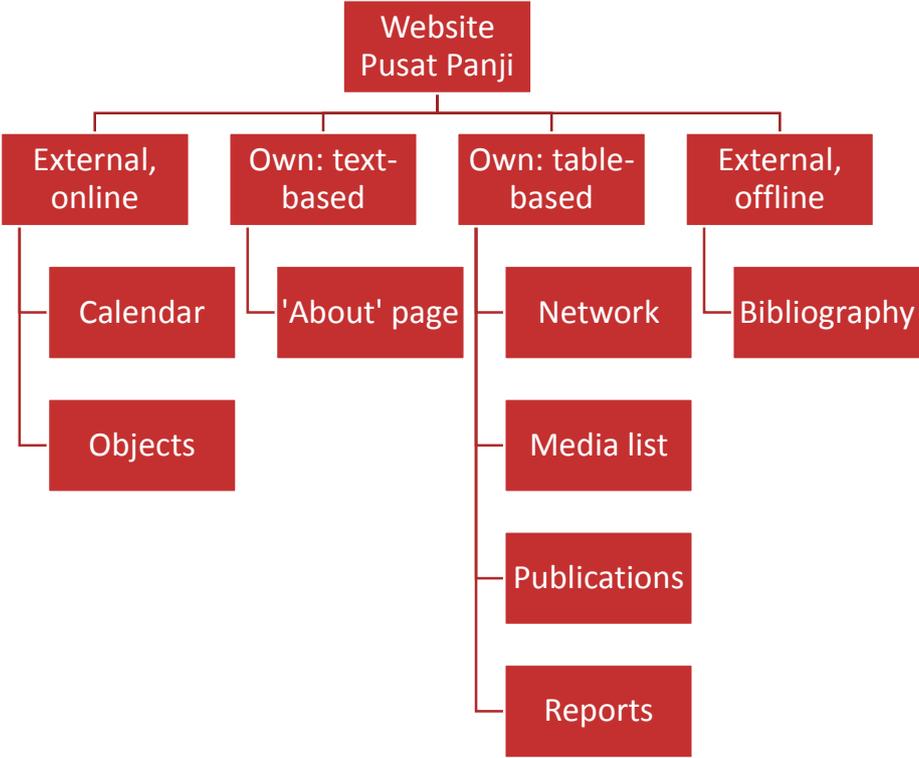In the following, I discuss the proposed solution for each of the functions.

Figure 0-2

1. Static and Text Based: The 'About' Page

The 'about' page is as good as static, it serves only the initial representation and does not need to be adjusted as often as other functions such as an event calendar or a bibliography. Additionally, the set up behind the 'about' page is extremely simple: plain text with minor formatting.

At best, static and easily constructed pages like these are edit-able within the browser. Fortunately already existent, external software like Tinymce can be used to replace visible HTML (Hypertext Markup Language) commands and provide a more accessible interface for formatting the text.

As the content of these files will be directly executed on the server, sufficient security measures need to be taken, so that no malicious code is inserted.

---- Proposed service/format/tool: .htm-file edit-able online using Tinymce ----

2. Calendar

Again, like in the case of services used for internal communication, a large number of services is already available to create and edit calendars online. I propose a Google product, Google Calendar, here for a number of reasons. First, many people use the service already and will not need time to adjust to a new software. This complies with the aim to keep the functions and services used as easy and easily learnt (for both the user and the editor). Furthermore, the service is free of charge and thus complies with the aim to keep costs low. As is the case with Facebook, issues oftentimes mentioned when talking Google, such as privacy, are no problem here either, as the information provided by the Pusat Panji is intended for publication anyway.

---- Proposed service/format/tool: Google Calendar ----

3. Table-based Data: Media List, Reports, Publications and Network

As all the given sections of the website are expandable ones, they need to be based on a system that allows gathered but distinguishable sets of data in a common repository. The most basic of these systems are surely tables, the system proposed here. As described above, more sophisticated systems like MySQL or PostgreSQL databases are no option, as their use would raise (even if only slightly) the cost of maintaining the website.

The proposed file for format is .csv, basically a plain text file that uses one or more characters to be specified to differentiate table cells, line breaks to distinguish rows. Major advantages of this format is its free and flexible definition and its easy comprehensibility. To make the editing process easier, it also needs to be possible to edit the tables in the browser window.

---- Proposed service/format/tool: .csv files (with online editing system) ----

4. Bibliography

Certainly, the bibliography feature could also be implemented using a basic .csv table. Because of the quite large variety of different kinds of references though, this would be comparatively hard to implement. Also, a number of free software reference managers are already available, which makes the implementation of an own one as good as obsolete in this context.

I propose the use of JabRef, a highly adjustable bibliography based on Java (the programing language), and thus usable on all major operating systems, complying with the aim of cross-platform usability. JabRef, given its keyword feature, can be used for quick searches within the bibliography and can, especially thanks to its adjustability, be used to organize and inventory the Pusat Panji's planned library also offline. Thus, it is useable software for the center overall, even without minding the website.

Finally, JabRef has an adjustable export feature, with which the table-like presentation of the bibliography online can be generated. Whereas a traditional bibliographical listing in one of the common citation styles would most likely contradict the aim to create a good looking website, the *Pencinta Panji* (lovers/friends of Panji; the group behind the Pusat Panji) decided that a traditional bibliographical listing also needs to be provided. This can be exported from JabRef without further adjustments.

A downside of the use of the proposed program is that, since it is highly specialized software, training needs to be provided to the respective website editors. The advantages of its use, both for inventarization as well as for digital representation, do however outweigh this downside.

---- Proposed service/format/tool: JabRef ----

5. Objects

As the digitization and digital representation of objects is a much more complex and extensive process than those described above, it is practically impossible to find a really easy way to implement it without spending money for outsourcing the process. Another difference is the limited role the Pusat Panji in its mostly coordinating function can play here, as it has no access to related objects itself and copyright issues may arise from direct work on other organizations' or institutions' objects.

The proposed way to handle these difficulties is the use of Museum-Digital in close cooperation with the institutions and organizations holding the respective related objects.

Museum-Digital is a free platform for museums to create digital inventories of and present their objects and collections, aiming for comprehensive usability in its context while letting the institutions decide which information to give out, aside from some very basic information on each object (this means, for example, a description and a name). Originating in Germany, it is currently being translated to Indonesian and English. Because three major factors, aiming for comprehensiveness, the policy to let users decide on all use of their data and, the initiative's need for consistency while letting users add data easily and freely make its system rather complex, specialized training is definitely necessary in this case.

Exactly there, the Pusat Panji finds its role: While Museum-Digital can provide initial trainings for those responsible at the Pusat Panji, those responsible can then work as multipliers teaching museum workers etc. how to use the platform.

Finally, the objects, once online, can be embedded into the website of the Pusat Panji.

---- Proposed service/format/tool: Museum-Digital -----

6. A Guide on How to Edit the Website

In this section, basic information on the functions and use of the proposed programs can be found. One of its main functions is to also build the initial documentation on the ways of the Pusat Panji's digital representation. By providing an in-length documentation, another step is undertaken to ease the editing process in the future.[5]

1. ORGANIZING THE EDITING PROCESS

To enable a smooth and easy editing process, all functions for editing are gathered on a single page. This first page of the 'backend' links to the single editing options, both internal and external, and is thus the first page an editor visits in the editing process.

More links are provided to the respective files to encourage learning about the technical background of the website.
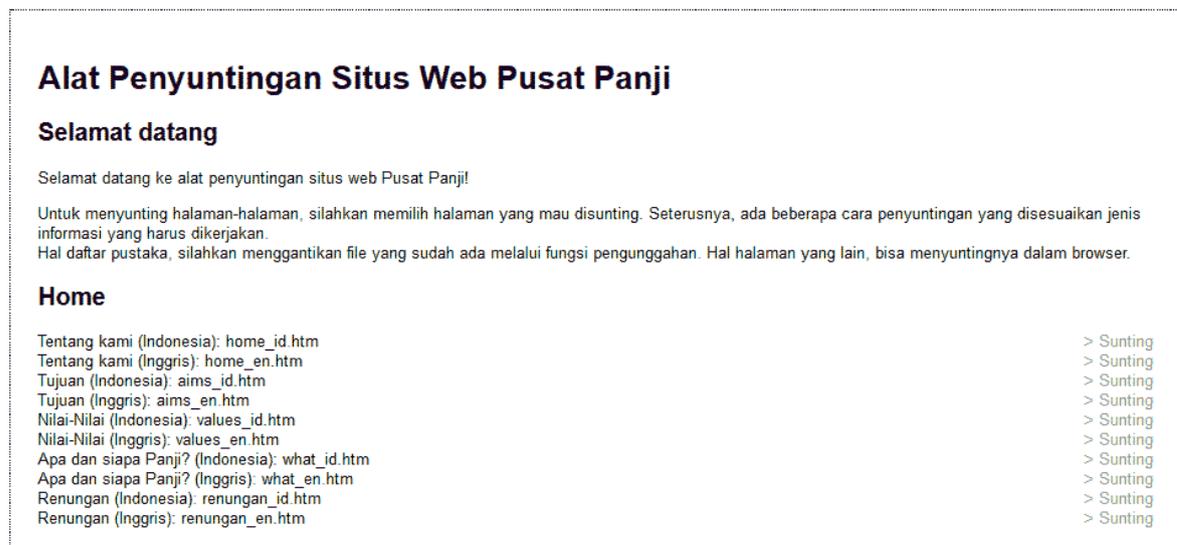
Figure 0-3: The starting point of the editing process

2. EDITING THE 'ABOUT' PAGE

To edit the 'about' page, an in-browser text editor based on Tinymce is used. The editor enters information and formats it using a familiar interface. The formatting is then automatically converted to HTML-code, checked for potential security risks, and saved.

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[5] It is assumed that Facebook is by now so common that it needs no further discussion.
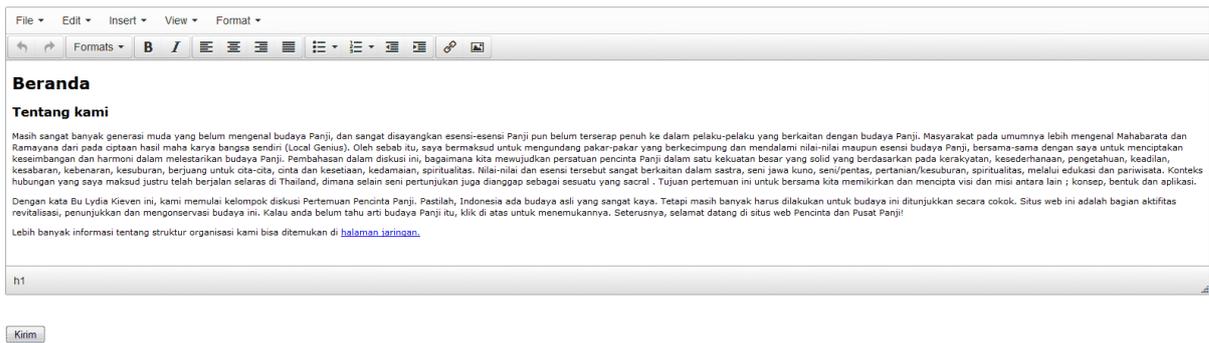
Figure 0-4: Editing static pages through a formatting interface

3. GOOGLE CALENDAR

Google Calendar, true to its name, is Google's calendar service. This means that whoever has a Google account also has access to the calendar, and that the page layout of the service should be comparatively familiar.

The calendar used by the Pusat Panji is connected to an own Google account, thus the editor needs to log in to that account first before they can proceed to the calendar's page. After the login, the calendar can now be accessed by clicking at the symbol consisting of nine squares in the upper right of Google's pages, then on "calendar". Alternatively, a direct link is provided in the Pusat Panji's website's main backend page.

Finally accessing the calendar, the editor will now be able to add events by simply clicking on the given date. Further information can be added by clicking on "edit event." Since the default setting of events can be set to "public", the event will be directly visible in the website's embedded calendar.
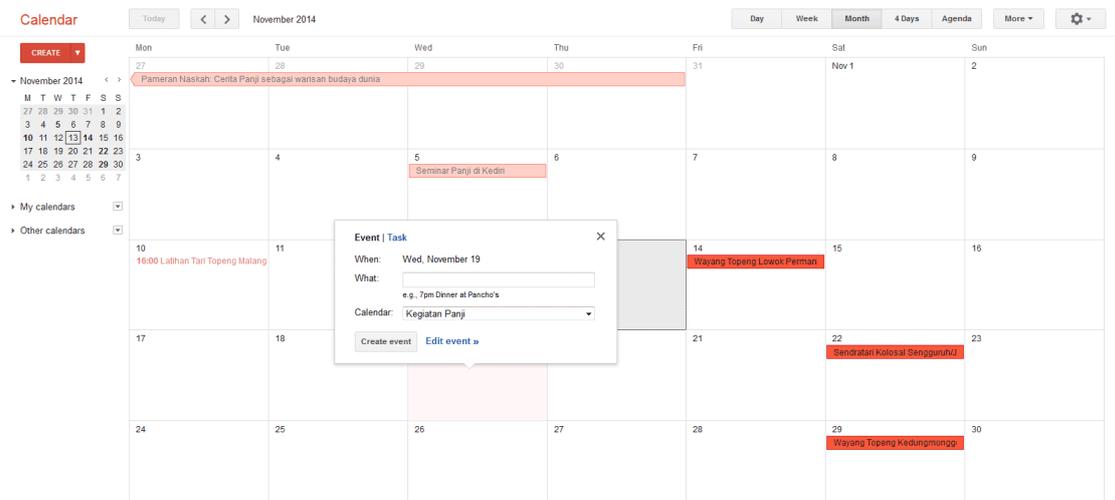

Figure 0-5: Adding an event

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4. EDITING TABLE-BASED PAGES

Table-based, expandable pages are edited directly on the website. To edit the more basic of these pages, a simple click from the backend's main page leads to form for all required information for the respective kind of entry. Here, information is added that will subsequently be written into the tables to form identifiable sets of information for the server.

To not overload the page and because in many cases formatting is not advisable here, there is no interface for formatting provided here. Thus, should the editor want to add formatting, they will need to use basic HTML-commands. A list with the most basic of these is provided at the bottom of the page.

Silahkan menyunting di sini dan klik ke fungsi penyimpanan!

Judul: Title

Deskripsi: Description

Tautan: Link

Penulis: Author

Kirim

Ini fungsi HTML dasar yang bisa digunakan di dalam bidang di atas.

Fungsi dibuka	Fungsi ditutup	Artinya apa...
 		Line break
<h1>	</h1>	Caption 1
<h2>	<h2>	Caption 2
<p>	</p>	Paragraf
<img src="">		Akan memunculkan gambar/foto yang dispesifikasi dalam *src*
		Link/Tautan ke mana yang dispesifikasi dalam *href* ini.

Figure 0-6: Example: editing reports for events (Required fields: title, description, link, author)

Upon a click on *kirim* (send), the information will be written into the tables in the correct order, to be subsequently read by the server. Again, security checks are done, to prevent malicious code from entering.

A slightly more complicated case are expandable sets of data that require the use of media, for example publications of the Pusat Panji. In the given example, a .PDF of the published paper needs to be uploaded, and thus the editor is sent to an upload page before proceeding to a page similar in style to the one displayed in Fig. 5.3. Links to the .PDF are automatically provided, to not require copy-pasting of filenames et cetera, and thus reduce the likelihood of falsely added links. A similar function is not available or necessary in the case of videos, as these are, due to their relatively large file size, better saved elsewhere.

5. JABREF

To edit the bibliography, the editor needs to install JabRef. Subsequently, a few adjustments need to be done: a custom field for places (the location of physical copies of the respective book) and a custom export function, to later export the information in the same style the website of the Pusat Panji uses, provided by the Pusat Panji, need to be installed.
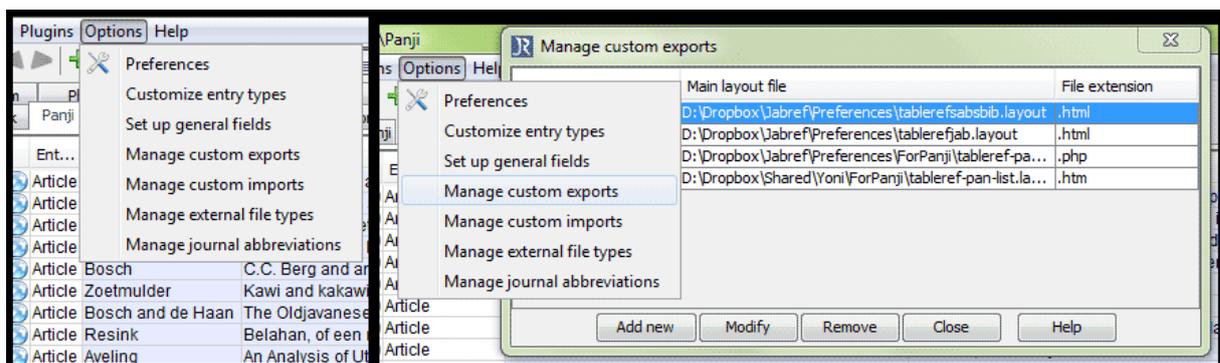

Figure 0-7: Doing the adjustments on JabRef

Adjustment to the default location of .PDF-files can be made to set relative links to the files, with the result that various editors can potentially use JabRefs to work on the same database and use its listing of .PDF-files collaboratively. Since JabRef has no built-in synchronization function, JabRef databases and, in case, the given .PDFs need to be synced via shared folders of cloud computing software. All these adjustments are part of setting up the program for the purposes of the Pusat Panji, they only need to be done once.

Figure 0-8: Using one JabRef database with various editors

The database is, to put it in the simplest terms, a long plain text file of standardized BibTex information. This means, that it can, in case the project is eventually discontinued, also be read by other software without further adjustments.

After these adjustments are done, the database can finally be edited. With a click on the "+" symbol in the menu at the top, a new entry is added. The editor now needs to choose what kind of entry it is, for example a journal article, a book, a chapter of an edited volume et cetera. Then, data can be written into the respective fields. To finish the process, a click on the magic wand symbol creates a unique, identifiable (BibTex) key.
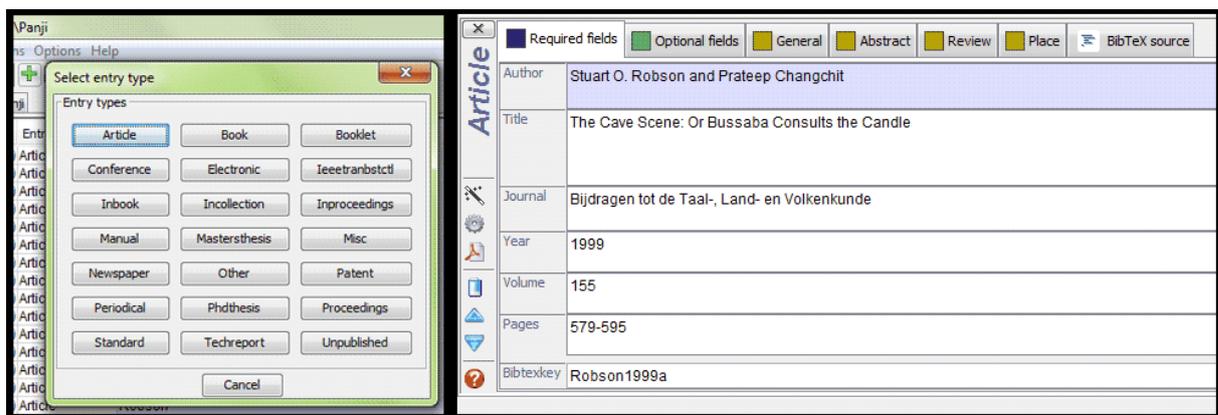

Figure 0-9: Adding and editing entries

Once all new entries are added, the database is to be exported. For this, the editor selects the option *Export* in the *File* menu. With this export, a new file in a preset file-type will be created using the database's data as specified by various export routines. Say, the custom export function previously installed is usually set to export the database entries into a table in an .htm-file. The editor subsequently exports using the Pusat Panji's custom export function and uploads the file using the website's backend.[6] The table on the website is now updated.

The same process is followed to update the .rtf-file containing all entries in a traditional, academic bibliography style. JabRef's pre-installed Harvard citation style function can be used for this purpose.

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[6] Upon reading the file (when a user accesses it), potentially malicious code will be filtered out by the server.

Figure 0-10: Updating the website's bibliography

6. MUSEUM-DIGITAL

The Pusat Panji's website embeds topical objects from the Indonesian version of Museum-Digital. As the software is just newly translated, the Pusat Panji also has a role in teaching museums how to use the software.

Generally, it is an open project of and for museums used for inventorying museum objects and publishing information on these. This means that on a top level there are three sets of information: museums, collections and objects. Usually, each object is linked with a museum and a collection. Thus, a sufficient representation of the participating museums is ensured.

Nevertheless, the focus of the project is on the single objects. To add an object, most basic information are required: An inventory number, the kind of object, a description, measures and the materials and technique used. An image of the object is additionally required, if the object is to be published and not only visible to editors of the given institution. Subsequently, a large number of other information for public representation (for example, more photos, related documents, connections with other objects) as well as inventory (for example, entry number, location in the depot) can be entered. The latter kind of information is not visible to editors from other institutions or the general public.

Two especially important points need to be noted: the copyright of an object and related images and the tagging of objects. Museum-Digital requires editors to provide sufficient information on the photographers of a given object and the license of the given photograph to prevent future problems with copyright holders. At the same time, editors are thus reminded to use photographs whose rights they or their respective institutions hold.

Good tagging on the other hand is necessary for Museum-Digital's search function and for the indexing of the website with search engines like Google, Yahoo or Bing. Indeed, Museum-Digital offers two forms of tags. First and preferably, events revolving around an object can be added. This means that something (an event) happened to the object, executed

by someone at a given time and place. Thus, the object is immediately with three searchable keywords. For example, a letter was <u>written</u> (event) by a <u>person</u> at a given <u>time</u> and <u>place</u>.

In case of more general terms and relations, single keywords can be given. This means that, for example, a Wayang Topeng mask can be linked with the terms *wayang* and *topeng* (mask). Adding a new keyword requires the user to add additional information, like coordinates in case of places or the date of birth of a person, on the given term (be it a person, a place or a time). Thus, the database will soon be an extensive source of ordered information.

7. Fitting the Parts Together: The Final Website

Finally, all the parts presented in the previous sections have to be fitted into one website, which, just like the single parts, complies to the requirements of easy usability and minimal cost. Additionally, as it is the main representational place of the Pusat Panji, great care needs to be devoted to making the website easily accessible and attractive to users. Especially its location in Indonesia, a country in which access to fast and stable internet is not yet a given, means that an even larger focus had to be laid on accessibility and fast loading times.

Overall, this means that the site needs to be very slim and cannot rely extensively on photographs for its design. Instead, forms and solid areas prevail, as these result in no considerable traffic. Obviously, this restricts the possibilities of website design, but an at least assumingly viable middle ground between speed and

Figure 0-11: Options are provided to disable images where they are not absolutely essential

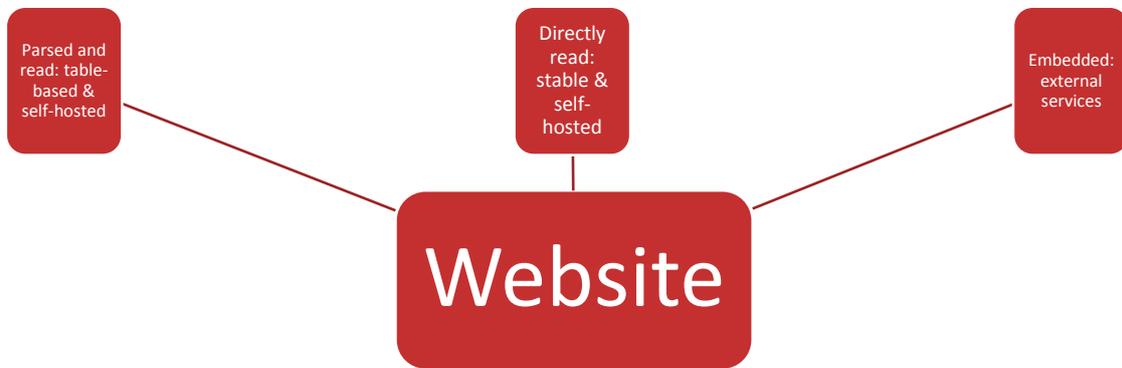design could be found by providing alternatives for the user. Wherever photographs or other media are directly embedded into the site, the user can choose to either simply turn off the display of more traffic-intensive parts (say, images) or to change the mode of presentation. On the other hand, it is the very same elements that are to be switched off by users with a slow internet connection. Therefore, a more traffic extensive, meaning prettier, version also needs to be provided and the given elements cannot simply be omitted.

Thus a potentially easily loadable website can be ensured while keeping a possibility to create a good looking website. It is important to note that the combination of an appealing appearance and fast loading times can be aided by relying on (small) repeated patterns, instead of photos (with a larger file size).

Another aspect of accessibility is, in the special case of the publication platform of the website, to make it easily indexed by the 'robots' (scripts, that search the internet for contents) of academic search engines like Google Scholar. Aside from adjustments to the folder structure, this also includes that the right metadata need to be made accessible to the robots. This can be generated from the .csv tables.

Generally, contents from external and internal sources are entered into the website in two ways. While external web-based services used have export functions to create easily

embeddable pages, self-hosted contents (including the file created by JabRef's export tool, after some security checks) are read directly on the server. In the case of expandable pages in tables, the tables need to be parsed (translated into text or forms legible for humans) previously to fit the right table cell's content into the website at the right place.

Figure 0-12: Displaying data on the site from various kinds of sources

Out of these, only the parsing of the table requires any more extended coding. Thus the code can also be kept relatively easily understandable, should all of the website be given to a new administrator in the future.

8. Conclusion

In this paper, I presented the thoughts behind the digital infrastructure of the Pusat Panji and how the problems arising from the need to set up one were met. Thus, the paper works as a documenting piece for internal use as it presents a viable example for organizations with the same needs.

General requirements of the infrastructure to set up were that no part of the infrastructure, except for potentially a most basic hosting plan, may result in any financial costs and that each part needs to be easy to use to the editors. If possible, functions used for the representation part (the website) should also be usable for other offline tasks of the organization.

Many external functions could be used and did not need to be programed specifically for the project. Just like these, the functions programmed specifically for it were checked for complying with the requirements. This leads to sometimes most obvious and yet less likely choices like the Facebook Group as the primary forum of communication. Indeed, where usability and familiarity prevailed as strongly as here, other considerations speaking against the use of it had to be ignored.[7]

Finally, the different parts are joined together to form the website. Here, accessibility for anybody is a most crucial point that can be reached without totally giving up on an attractive design by installing switches and letting the user choose, whether they want to use the prettier but slower or the plainer but faster version of the website.

Since most of the problems encountered by the Pusat Panji and the requirements on digital infrastructure arising from these apply in the cases of comparable groups, too, the experience of the Pusat Panji laid out in this paper may be used by other similar organizations in conceptualizing digital aspects of their work.

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[7] Of course, this only applies to organizations handling only little to no sensitive information like the Pusat Panji.

9. Abbreviations

CSV   Comma-Separated Values (*or* Character-Separated Values)

CMS   Content Management System

HTM   Hypertext Markup

HTML   Hypertext Markup Language

ICT   Information and Communication Technologies

PDF   Portable Document Format

RDF   Resource Description Framework

10. Appendix

1. LINKS TO THE PROPOSED EXTERNAL SOFTWARE/SERVICES

Facebook   https://www.facebook.com/

Google Calendar   https://www.google.com/calendar/

JabRef   http://jabref.sourceforge.net/

Museum-Digital   http://museum-digital.de/

Tinymce   http://www.tinymce.com/

2. REQUIRED INFORMATION FOR EACH SECTION

Section (Subsection)	Required Information
Events (Calendar)	Title of event
	Description of event
	Place
Events (Reports)	*If text has been published elsewhere:*
	Title of report
	Preview of the text
	Link to the original report
	Author
	If the initial publication is on ppanji.org
	Title of the report
	Text
	A note, that the text is published internally
	Author
Media (Videos)	Title of the video
	Link to external source
	The place where the video was shot
	The group acting in the video
	Uploader
Media (Image Galleries)	Title of the gallery
	Link to the gallery (external)
	A preview image
	The group displayed
	The place where the images were taken

	Uploader
Publications	Title
	Cover image
	Author
	Date of publication (year)
	Abstract in Indonesian
	Abstract in English
	Keywords
	Language
	File name of the PDF
	Title of the series the paper is published in
	Serial number
Network (Supporters/Affiliates)	Name
	Background and activities
	Place
	Website
	If a profile is to be enabled
	Affiliation
	A short description
	A profile picture
Network (Links and others)	Name or title (in case of websites)
	Background and activities
	Website