

# Using the Process-Assets Framework for Creating a Holistic View over Process Documentation

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**Abstract.** When an organization has not adopted a uniform and standardized way of producing and storing process documentation, keeping track of and maintaining process documents can be a real challenge. In this paper we suggest a framework for organizing process documentation which is created in different notations, for different purposes, and stored in different formats. We show how this framework has been applied in a real case in an organization where such problems are present. We discuss advantages and disadvantages of the framework and suggest further development and testing of the framework to improve its usability.

**Keywords:** BPM · Business process · Process documentation · Process map

## 1 Introduction

This experience report is aimed at attracting attention to an insufficiently researched practical problem that prevents reuse of existing process documentation. Besides stating the problem, we also present a solution tested in the course of our project. We do not insist that the solution (how) is optimal, but testing it in practice has helped us to further investigate the problem (what), and requirements on a solution. The paper presents the business case in which the problem has been encountered and the solution tested, as well as lessons learned about the problem and solution that could be of interest for both researchers and practitioners.

Ideally, all work revolving around business processes should be carried out in a systematic and carefully managed way, and be aligned with overall business goals and strategies [1]. However, as we discovered in the course of the project reported in this paper, this policy is not followed in practice in all organizations. Some organizations lack a structure to lead their work in Business Process Management (BPM). Still they perform business process related projects. Such projects are performed sporadically, i.e. on-demand. They can be completed locally by some department, or with a wider scope, e.g. analysis of the processes that run through the whole organization, or even several organizations. The on-demand BPM projects can be completed in connection to reorganization, acquiring or developing new IT-support, etc. They produce process maps and other types of process documents specifically aimed at the purpose of the project.

After the given BPM project ends, the documentation produced is filed in an unsystematic way. Reuse of the documents is mainly based on the people engaged in the project remembering its details. They can retrieve the documentation through search based on the project name, date, participants, etc. Possibilities of reuse under these circumstances are limited, especially considering that people may leave the organization. Lack of systematization can result in loss, or underuse of valuable knowledge contained in process maps and other process documents. It can also result in the same process being investigated several times as people who decide on new projects may not be aware of the previous projects.

The problem of unsystematic BPM encountered in the project reported in this paper, is not unique for the organization we investigated. The same phenomenon has also been encountered at least by some other researchers; see, for example, [2]<sup>1</sup>. BPM consultants whom we interviewed also pointed out that many of their clients experienced the problems with unsystematically stored process documentation.

This paper reports on the project aimed at developing and testing a solution for systematizing and organizing process documentation created in an ad hoc, on demand fashion. The solution was worked out for a specific business case of an organization that has produced around 100 process maps in an unsystematic way. As the problem we dealt with was of general nature, we were looking not for a specific solution for this organization, but for a generic solution that could be used in other organizations independent of their business domain. The implementation of this solution in a specific organization presented in this paper thus could be considered as proof of concept of the suggested generic solution.

As a basis for systematizing process documentation, we used the process-assets framework [3]. This framework has been developed for finding all processes within an organization, starting from the main processes. As the framework was created with another purpose in view, it, in its original form, did not directly fit our goal. Therefore, we adjusted the framework for a new purpose while testing it on the material from the organization we investigated. Consequently, the goal of the project became twofold:

1. Solve a concrete problem in a specific organization while devising a generic solution that could be used in other organizations. This goal included creating a solution independent of business domain.
2. Test the usefulness of the assets-process framework from [3] for a new purpose, namely, systematization of BPM documentation produced in ad hoc, on-demand manner<sup>2</sup>.

The rest of the paper is structured as follows. Section 2 presents the project context: the case organization, problem, and project participants. Section 3 is devoted to analyzing requirements on a solution. Section 4 gives an overview of our efforts to find a standard solution, and a suitable basis for a new solution. Section 5 explains the

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<sup>1</sup> Actually, [2] is the only paper, we were able to find that reports on this problem.

<sup>2</sup> This sub-goal is in-line with the special theme of BPMDS 2014 as it is directed for increasing the value of the previous business process modeling projects.

process-assets framework chosen as a basis for our solution. Section 6 describes how this framework has been transformed to fit the new purpose. Section 7 deals with creating a solution for the case organization. Section 8 is devoted to evaluating the solution for our business case. Section 9 discusses lessons learned and limitations of the work completed so far.

## **2 The Project Settings**

### **2.1 The Investigated Organization**

The project took place in a Swedish organization operating in the area of betting, in the text below referred to as the *betting company*. The betting company offers betting both through physical shops and online. The main office currently has 250 employees, whereof nearly half are employed by the IT department. The turnover of the company is around thirteen billions Swedish Crowns (SEK) annually.

### **2.2 The Practical Goal of the Project**

Since year 2000 the IT department of the betting company has conducted 11 process mapping projects that have rendered a large amount of process documentation. The reasons for these projects have been of varying kind, to improve efficiency, to develop computer systems, to oblige to new legislative demands, only to mention a few. There is no formal repository in place, and the different projects have made their own decisions about what modeling languages, methods, and tools to use. The documentation has therefore not been uniformly designed and stored, and has over the years become very difficult to retrieve and reuse. By the beginning of 2013 this problem had reached such dimensions that there was uncertainty of the exact number of existing process maps as well as where to find them. As a result, already gained knowledge on business processes had sometimes been lost, and redundant work had been done in investigating the same processes several times. A need to create a *holistic and comprehensible overview* of the existing documentation had arisen, and a project for this task was initiated.

### **2.3 The Project Participants**

The project was carried out in 10 weeks by two business analysts (BAs) who were entrusted the task of finding a solution for the problem identified, a scientific adviser, and two employees of the betting company's IT-department. The roles of BAs were held by the first two authors, while the third author served as a scientific adviser. As far as participants from the betting company are concerned, one person held a position of chief systems architect; the other one was responsible for all internal support systems. The BAs were given full access to company's all known process documentation, and unlimited access to the participating members of the IT department.

### 3 Establishing the Requirements

It was a strong and explicit wish from the betting company that the holistic overview of the process documents would be presented in a graphical form. The holistic overview should also be easily understood by any person with knowledge of the company's terminology, not only by IT managers and developers. Furthermore, the holistic overview was not to change the existing BPM documents in order for them to better fit the overview. The latter requirement concerned both content of the documents, and the format in which they were stored.

Further requirements were elicited by studying the process documents. By examining the documentation we found that a total of 137 processes had been identified for the company's regular operations. 85 of these processes had been thoroughly described with start, end and activity flow, i.e. documented in detailed process maps. Some of the 85 process maps overlapped, since the processes had been investigated within different projects with little or no cooperation between them. In some maps inconsistencies were found, implicating that these documents were not checked for logical or formal correctness. There were also maps that described only parts of processes. A variety of mapping notations was found, as well as different methods of document storage. The remaining 52 documents described processes in a somewhat loosely manner as functional business areas with no clear starts, ends and activity flows.

Based on the investigation completed, the following list of requirements was compiled on holistic overview of process documentation, which we below refer to as the *holistic process model*:

1. The holistic process model should be presented in a graphical form.
2. The holistic process model should be easily understood by any person with knowledge of the organization's terminology.
3. The holistic process model must not in any way introduce changes into the existing process documentation.
4. The holistic process model must not rely on that all process documents are produced using the same notation or technique.
5. The holistic process model must not rely on that all process documents are stored in a specific way.
6. The holistic process model must not rely on that all process documents are produced having the same purpose in mind.
7. The holistic process model must not rely on that all process maps included in the process documentation are correct.
8. The holistic process model must not rely on all processes within the organization are mapped.
9. The holistic process model must not assume that a process document or map depicts exactly one process. It can depict more than one process or "half" of a process.
10. The holistic process model must not assume that only one map exists for a particular process.

## 4 In Search for a Solution

### 4.1 Searching for a Standard Solution

Before inventing a new solution, we checked whether there is a known solution for the problem identified in the betting company. For this, we, first, investigated whether this problem is unique for the betting company, or if it had been discovered in other organizations. The investigation has been done in two directions: (a) interviewing business management consultants with experience in BPM projects (b) literature search.

Two BPM consultants were contacted to check for real-life experience of the problem and possible solutions. Consultant No 1 belonged to a consultancy that the betting company had engaged for one of their projects. This consultant estimated that around 70% of their clients had experienced problems with finding documents on a given process. Among the other 30% of their clients, this was a lesser problem, due to the fact that they had implemented a process management structure with committed process owners and centralized standards for documentation.

Consultant No 2 was not bound to the betting company. He stated that most of their clients had experienced problems with finding process documents, and also with understanding their contents. Some clients had solved this problem by adopting formal repositories.

None of the BPM consultants interviewed knew a standard solution for the problem or had encountered the problem as a subject at any conference or congress. The search through the research literature has not resulted in a solution found for the problem of creating a holistic overview of already existing process documentation. The search was done on different variation of the phrase “organizing process documentation”. A number of works has been found that proposed solutions for related problem, for example, works on automatic process clustering [4], and business process models repositories [5,6]. However, we found no works explicitly devoted to the problem at hand. The only paper we found that refers to this problem explicitly was [2] that investigated BPM experts’ points of view on the problems in BPM. This paper includes extracts of the interviews of the following kind:

- “When one looks at the way that an organization gets its work done, you see that part of this is an important strategic level and part of this is an important operational level”
- “Often 4,5,6, different places in the organization run BPM projects and then you have the problem how to bring these local projects together, in an overall process architecture. I see a lot of bottom up projects but no way to tie that all into an overall business strategy or process strategy of the organization.”

Though [2] confirms that the problem is spread, it does not suggest any solution for it.

## 4.2 Choosing a Suitable Framework

Though, to the best of our knowledge, there is no standard solution for the problem discovered, there exist several ways of classifying business processes that could be used for building a solution for the problem. To such classifications, for example, belong:

1. The classification based on the Porter's value chain [7] that differentiates primary and supporting processes, and inside each of categories differentiate sub-categories, like in-bound logistics (main process), or procurement (supporting process).
2. Process Classification Framework from the American Productivity & Quality Center (APQC) [8] which classifies processes dependent on the industry.

Other classification schemes are in details analyzed in [6] devoted to developing semantic annotation for business process models repositories. Besides classification schemes, we also considered a fractal process-assets framework [3,9] that allows to arrange all processes in an organization in a tree-like structure connecting them through the assets used in each processes.

Neither existing classification schemes, nor the process-assets framework have been tested for the practical task of organizing ad-hoc created process documentation, at least, to the best our knowledge. All these frameworks concern business processes not documents that can depict only part of the process or several processes at the same time. In addition, some of the classifications use quite abstract taxonomies and it has not been clear whether such taxonomy would be easily understood by practitioners.

As we did not have any special reasons to prefer one framework over all others, we decided to start with the process-assets framework [3,9] because of having more intrinsic knowledge of it and limitation on time for completing the project. As the process-assets framework is not widely known, in Section 5, we give a short overview of it, before describing how it was transformed to suit the task at hand.

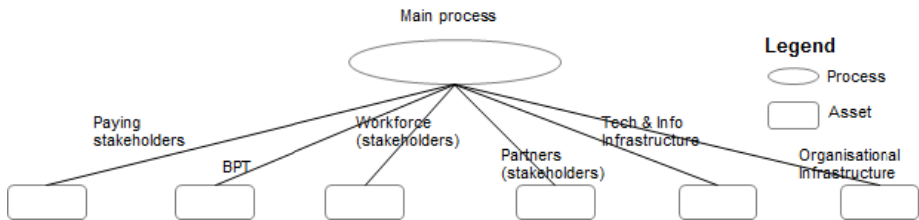
## 5 The Process-Assets Framework

The process-assets framework consists of the process-assets archetype (Fig. 1) and the asset-processes archetype (Fig. 2), building on the idea that any business process in a company rely on the company's assets in order to be executed properly, and that the assets themselves need supporting processes to keep them in shape.

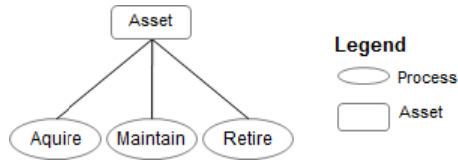
The process-assets archetype shows a process and various assets that are needed for this process to function friction free on a repetitive basis. The first process in the framework is the main process of the organization. The assets are divided into six different categories.

1. *Paying stakeholders*, e.g. customers of a company or paying members of a club.
2. *Business Process Templates (BPT)*. For a manufacturing company this is both the design of a product and a scheme of technological process of its production.
3. *Workforce*. People that are qualified to work in the main process.

4. *Partners*, e.g. suppliers for the manufacturing process of a company.
5. *Technical and Informational Infrastructure*. Equipment that is needed to run the main process. For a manufacturing company this can be production lines, computers, etc.
6. *Organizational Infrastructure*, e.g., departments, teams and management within the organization.



**Fig. 1.** The process-assets archetype



**Fig. 2.** The asset-processes archetype

For the above mentioned assets to be able to support a process the assets themselves need to be supported by a number of processes. This is where the asset-processes archetype comes in. This archetype shows what processes are needed to acquire, maintain, and retire an asset, see Fig. 2:

1. *Acquire*. Processes that are used to get hold of a certain asset, e.g. a recruiting process to add new employees to the workforce.
2. *Maintain*. Processes for keeping assets. This can be customer-relationship processes to keep customers, or training for employees.
3. *Retire*. Processes used to remove assets that are no longer needed. For the BPT category this can be to phase out a product that is not in demand anymore.

Having the above archetypes can help to unveil the dynamic process structure of an enterprise starting from the main process and going downwards via repeating the pattern "a main process->its assets->processes for each asset->assets for each process-> ...". In this way it is possible to discover all processes within an organization. First one defines the main processes and what assets are needed to run the processes. After that focus goes to the assets and what processes are needed to acquire, maintain and retire them. Then one starts to look at different assets that are needed to support the

acquiring, maintaining, and retiring processes. This procedure can be repeated until all processes within the organization have been found and arranged in a kind of a tree with a repeating pattern of nodes. Such kinds of structures are known in the scientific literature under the name of fractal structures.

Note that in practice, the process structure will not form an indefinite tree as the same process or assets can have multiple usages, i.e. serve different assets or processes. This will, in the end stop the tree expansion. For details on the process-assets framework we refer the reader to [3,9].

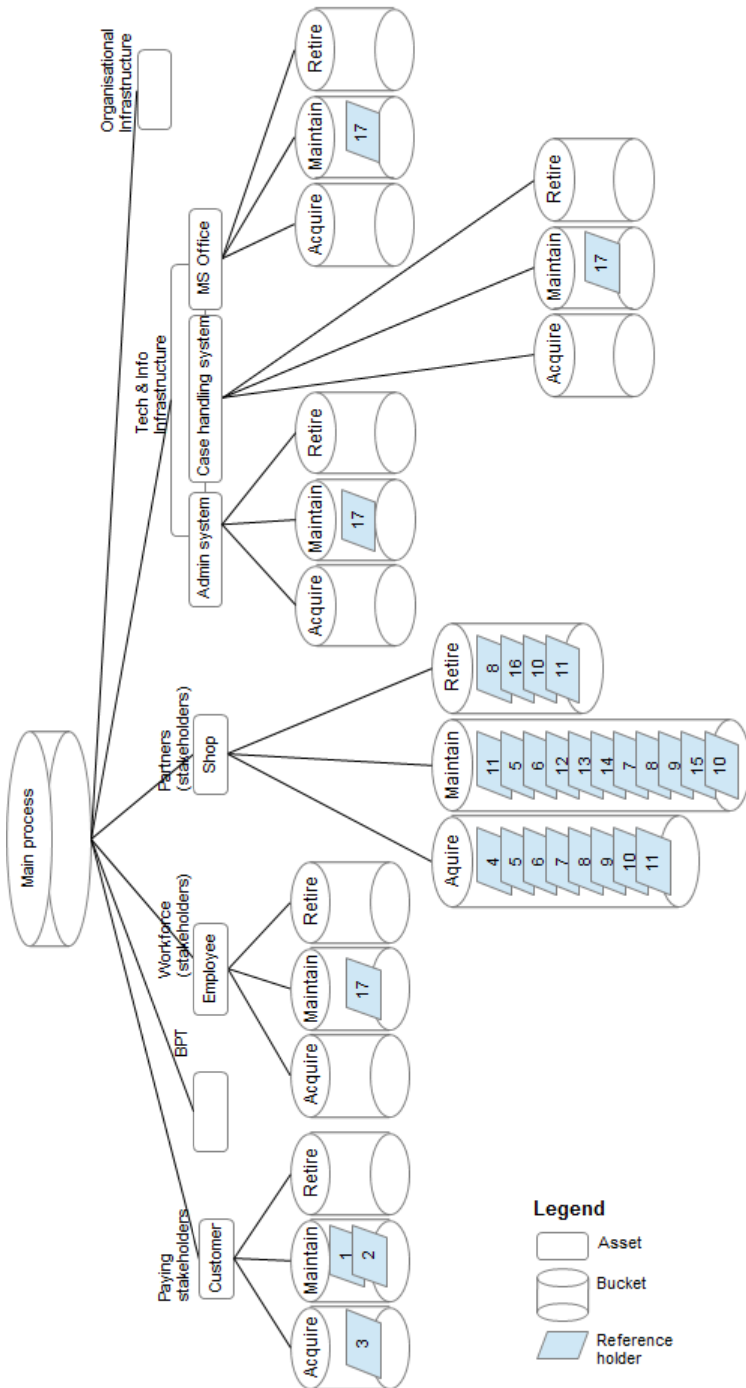
## 6 Transforming the Process-Assets Model for Our Purpose

For the purpose of our task to get a holistic overview of all process documents that exist within an organization, there is no need to go too deep into the fractal tree described in the previous section. The full fractal view would make the holistic process model too large and difficult to overview. Therefore, the unveiling of the model stops after two iterations as it is represented in Fig. 3. In addition, the ovals that represent the processes in the original model from [3] (see Fig 1, and 2) are substituted by cylinders that are called “buckets” where the related process documentation can be placed. Parallelograms are added to symbolize process documents.

As a result, we get a relatively simple structure where all existing process documentation can be mapped. The disadvantage of stopping at the second level of iteration is that the documentation related to processes on the third or deeper levels will be placed one or more levels up in the hierarchy. However, if the number of documents in each bucket is small, it will not be difficult to look through all documents in it manually to find out which process documents related to the given branch of the tree exist. Extending the tree too deep can make it difficult for a non-technical person to orient in the structure, thus there is a risk of breaking requirement #2 from Section 3 (understandability). Staying with two process levels and using the terminology accepted in the organization makes it easier to navigate through the tree for the members of the staff of the organization.

Naturally, the process documents themselves are not placed in the buckets. Instead, the model works with references to the documents, e.g. their serial numbers. Therefore, the holistic process model of Fig. 3 does not require making any changes to the existing documentation. Working with references also supports the solution to the problem of documents that describe more or less than one process, see requirement #9 in Section 3. If the document describes only part of a process, the reference to it is put in the bucket where it belongs, as if it were a fully documented process. In a situation where a process supports multiple assets, a reference to the process document will be placed in all buckets connected to these assets (see process 17 in Fig. 3 that is placed in three different buckets). In cases where multiple documents describe the same process, the references to them are placed on the same reference holder.





**Fig. 3.** The holistic process model after referencing 17 process maps

Using references in the holistic process model automatically satisfies requirements #3-7 from Section 3. For example, the documentation of the processes could be made with any methods or techniques, and the holistic model of Fig. 3 does not require that the existing documentation is correct. Neither does the model require that all processes of the organization have been documented. If there are no process documents related to a particular place in the tree, the bucket will be empty (see Fig. 3). This can be considered as an additional feature that shows areas in which there are no documented processes within the organization.

## 7 Building the Holistic Process Model for the Betting Company

Building a holistic model for the betting company based on the augmented process-assets framework was done in three steps.

1. Make a graphical representation of the upper level of the model. Go through the existing process documentation in order to find all assets mentioned in it. Put them under appropriate categories of assets on the upper level. In the case of the betting company, customers are to be placed under *Paying stakeholders*, employees under *Workforce stakeholders*, shops under *Partner stakeholders*, and computer systems under *Tech and info infrastructure*, see Fig. 3.
2. Extend the model by attaching buckets for *acquire*, *maintain* and *retire* processes for all assets identified in Step 1.
3. Investigate each process document in order to determine which assets the process described in it supports, and which of the asset process buckets acquire, maintain, or retire it belongs to. Place a reference to the process documentation into all buckets where it belongs.

To facilitate step three of the above, we compiled a document that contained metadata for each process map at our disposal. This document helped in determining in which bucket(s) to place references to any given map. The metadata represents a kind of semantic annotation of the process at hand; it includes the name of the process map as found in the documentation, and gives a short description of start and end conditions for the process. The latter helped us to understand the business goal(s) of the process. An example of process metadata is presented in Table 1. This table refers to the process related to applying for membership in Club XP. Club XP is a club that unites players interested in a game called Game XP. As a Club XP member, a player gets access to additional information about Game XP competitors on the weekly basis.

The resulting holistic process model after references to 17 process maps have been placed in the buckets is presented in Fig. 3. As can be seen from Fig. 3, most of the processes analyzed are related to the asset labeled *Shop*. A shop, e.g. a news agency, is a partner who takes bets on behalf of the betting company, and pays prizes to the winners. The processes in the *acquire bucket* deals with finding and setting formal agreements with new partners. The bucket *maintain* contains processes related to existing partners, the bucket *retire* contains processes related to canceling the agreement with a partner.

**Table 1.** An example of process map metadata

<b>Name of process</b>	Register new member in Club XP
<b>Start conditions</b>	A person/organization has applied for membership in Club XP
<b>End conditions</b>	The applicant is registered as a member in the Club XP membership database, or rejected. The applicant has been informed about the outcome of the application.
<b>Assets supported</b>	Member of Club XP [acquire], Club XP [maintain], Club XP membership database [Maintain] <sup>1</sup>
<b>Name of document</b>	Handling Club XP membership.doc
<b>Placement in storage</b>	Directory //G:/Club XP/Process descriptions/ <sup>2</sup>
<b>Serial #</b>	36
<p><sup>1</sup>Note that assets not explicitly named in the start and end conditions may also be supported by the process, their presence being discovered in the detailed descriptions of the process activities.</p> <p><sup>2</sup>It can also be something of the form “bookshelf in printer room 504” if the document exists only in the printed form.</p>	

To give better understanding of the holistic process model built for the betting company, below, we present some details on process documents 11 and 17 from Fig. 3.

Document 11 in the *acquire*, *maintain* and *retire* buckets of asset *Shop* deals with situations when a shop owner is retiring and sells his or her business to a new owner. In essence, this process serves multiple purposes, i.e., retiring the current shop owner, acquiring a new shop owner and keeping the shop open for betting services during the change of ownership.

Document 17 in the *maintain* bucket of employees and *maintain* buckets of IT-software systems describes the process for internal IT support. When an employee reports a problem encountered with any of the company’s software, it can result in a bug report filed in the company’s case handling system. The latter will lead to fixing the software, which means maintenance of the software asset. But the problem report can also come from an employee who misunderstands the functionality of the software. In this case, the problem report does not lead to a bug report filed in the case handling system, but to a training session that extends the employee’s knowledge of the software, which is maintenance of employees.

## 8 Evaluating the Results

The evaluation of the holistic process model built for the betting company was completed in two phases. *Phase one* of the evaluation was conducted with the chief

systems architect of the betting company, hereafter called SA (Systems Architect). The evaluation started with a description of the method and the model, to be continued by a semi-structured interview where SA was given possibilities to comment on fulfillment of requirements, applicability of the results, and their suitability for the purpose.

SA did not convey any negative opinion that would indicate that the requirements from Section 3 were not fulfilled. SA made positive comments regarding the graphical model. To SA, it was refreshing to see the information about processes presented in a new way, since it gave a new perspective, different from the one that is given by process flow diagrams. SA found that the model was suitable to be presented to the upper management since they are more used to look at organizational charts than business process diagrams, and that the holistic process model was somewhat similar to an organizational chart. The model also made it easier to find the places where there was lack of process documentation. SA did however point out that it was not possible to see how different processes from the same bucket are connected to each other, and that this could be an issue for further investigation aimed at extending the model.

*Phase two* of the evaluation was designed as an test consisting of two steps. It was carried out with a person responsible for all internal support systems at the betting company, hereafter called IS (Internal Systems). IS was first given a short tutorial on the structure of the model, and semantics of the graphical symbols in it. Thereafter, the test began.

Step one of the test was aimed at examining whether IS could find the information in a graphical model. IS was given a model that was pre-populated with assets and references to process maps, and a table containing metadata of the referenced process documents in the form as in Table 1. Thereafter, IS should complete assignments of retrieving information from the model and the table. IS navigated easily through the model and found all information that was asked for in the assignments, even in cases where the name of a process did not clearly depict its contents.

Step two of the test examined whether IS could populate a half-filled model. IS was given a model that was populated with some assets, but with their buckets empty. IS was also provided with a set of cards that held metadata about various process maps (in the form of Table 1). IS's task was to place references to the process maps described on the cards in the right buckets. In case an asset that was not already present in the model appeared on one of the cards, IS had also to place this new asset under the right asset category. This step of the test required more concentration from IS, and each placement was preceded by a monologue in which IS considered the right place or places for each process map. IS finally finished the task and had no problem with either process maps that concerned more than one place in the model, or process maps that dealt with new assets.

Interesting in step two of the test was that IS at one point decided not to place a reference in one of the buckets that we considered appropriate. When asked about this after all references had been placed, IS explained the reasons for the decision. We had apparently misunderstood the meaning of some terms used in the process documentation when building our holistic process model. This underlines the fact that the model is easy to understand and operate only for those who have good knowledge about the

organization and terminology used in it. The incident did not reveal a fault built in the modeling principles, it merely showed that IS knew the organization better than we did.

In total, the model, and the method of building and using it showed to be operational and useful for arranging and finding process documentation. There were no substantial difficulties for IS to perform different tasks in the test, but without the introductory tutorial before the test, IS would probably not have understood how to complete the assignments. This is due to the processes and process documentation were visualized in the model in an unusual manner.

## 9 Lessons Learned and Limitations

We summarize our experience from the project reported in the previous sections in the form of a list of lessons learned and limitations of the work completed so far. While discussing the lessons, we also point out areas where our work can produce *impact on research and practice*.

1. Not all organizations work with BPM in a systematic way, but rather adopt an ad hoc, on-demand approach to their BPM projects. This may lead to *unintended and undesirable* consequences reported earlier in this paper. This problem is known to BPM consultants, and but is not sufficiently covered by research literature.
2. To the best of our knowledge there is no solution for how to create a holistic view of large amounts of process documentation created in an ad hoc manner. The approach to a solution proposed and tested in this paper, even if not ideal, presents a starting point for discussing and comparing new solutions to the problem.
3. During our work, we found that known ways of classifying processes are not particularly suitable for the task of creating a holistic process view on the existing documentation. Either they are domain dependent, or do not take into account the diversity of process documents created in the ad hoc manner. The diversity concerns multiple aspects, e.g. many-to-many relationships between the documents and processes, diversity of notations and quality of the documents, etc.
4. The process-assets framework, originally developed for unveiling the dynamic process structure of an enterprise, showed to be a suitable foundation for creation of a holistic process model, but needed modification to fit this purpose.
5. The initial tests have shown that the model is understandable and have value for people who belong to the business depicted in the model, but who have not been directly engaged in its building. Though the results of these tests are promising, more validation is required.
6. So far, our approach to building a holistic process model has been tested only in one organization. Further validation of the approach requires its testing in other organizations. We hope that publishing of this work and spreading it among BPM researchers and consultants may help in promoting the adoption of our approach by the BPM industry.
7. So far, the model was built using Power Point as a drawing tool. Its usage did not create any major problems while the model was small (see Fig. 3). However,

using Power Point became cumbersome when the model grew to 85 documents, see Fig. 4, and the tree structure became impossible to keep on one page. There is a need to find a better tool, or create a new one specifically designed for building the holistic process models. In the latter case, the tool can even be integrated with the storage where all process documents are stored. In this case, clicking on the document reference can result in opening it in some document viewer. In a specialized tool, it would also be possible to expand or collapse parts of the tree dynamically to concentrate on parts of interest to the viewer. It would also be possible to trace maps that are referenced in more than one bucket, for example, by clicking and highlighting.

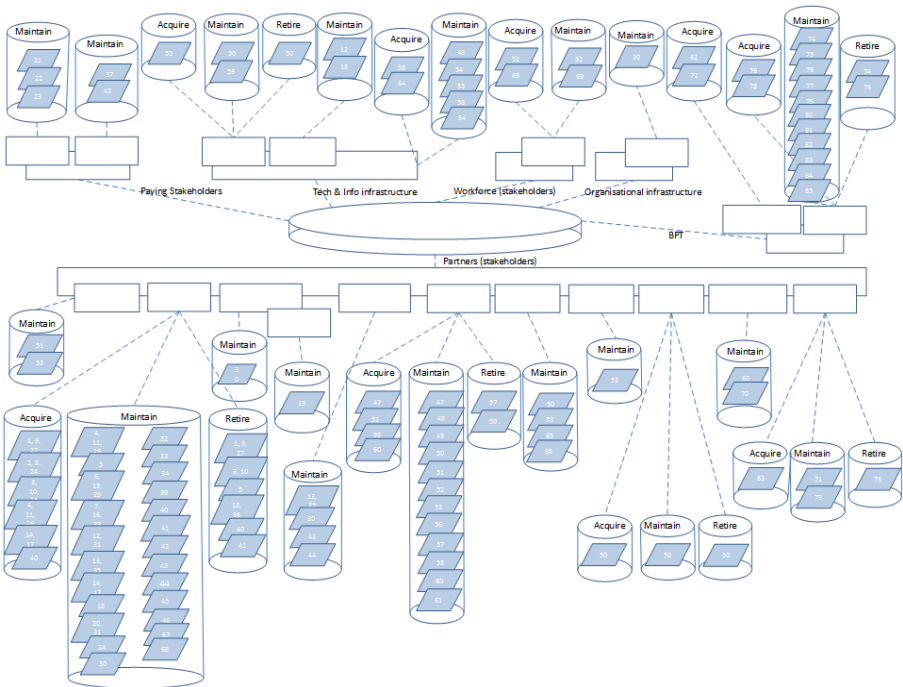


Fig. 4. The holistic process model after referencing 85 process maps

8. Right now, the holistic process model represents only process-assets-processes relationships. As was mentioned by the betting company's system architect, it would be advantageous to complement the model with means to show how processes are connected to each other in other ways, for example, how the output from one process is being used as an input to another.
9. The process-assets model, though proved to be useful for our task, requires further development. For example, it is not clear where to place and how to handle economic assets. Other organizations may require adding additional type of assets as well.

10. The biggest challenge in building the holistic process model for the betting company was to understand the nature of the processes depicted in each document. None of the notations used in these documents has been good at explaining semantic content in a simple and understandable way. They all rely on the reader's skill of how to interpret process maps. Variety of notations used in the documents made our task even more difficult. Though we created a special form for semantic annotation of the processes depicted in the documentation, see Table 1, we do not have a strict method for how to extract information from a document to fill this form.
11. The holistic model seems to work well for a mid-range size of process documentation (about 100 processes). It is not clear whether it will scale up to thousands documents. Most probably, a sophisticated software tool will be required to allow the scalability upwards.

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