

# bpmpatterns.org - An Interactive Catalog of Business Process Modeling Patterns Literature

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**Abstract.** Patterns – descriptions of proven and well-documented solutions for recurring problems – have gained widespread interest and acceptance in the area of business process modeling.

In the past years, a large number of such patterns have been documented in the literature. However, it is still difficult to find patterns that can be useful in a given context. The reason is that the relevant publications are spread in various journals and other types of publications, and there is no guidance for locating a pattern that can be useful for solving a given problem.

In this demo, we present an interactive web-site that provides a comprehensive overview on published work in the field of business process modeling patterns. It allows finding publications on business process modeling patterns based on various search criteria. It is intended to be useful both for business process modeling practitioners as for researchers in need of sound literature references. Currently, this catalog (meant to be a growing resource) provides an categorization of 95 publications on patterns as well as 50 publication on anti-patterns.

**Keywords:** patterns · anti-patterns · workflow patterns.

## 1 Introduction

The idea of publishing well-documented and proven solutions to recurring problems in a structured way as patterns can be traced back to the work of Alexander et al. [1] which discussed patterns for town planning and architectural design of buildings. In computer science, the software design patterns introduced by Gamma et al. [5] paved the way for pattern use.

Although a considerable number of papers about patterns in the area of business process modeling (BPM) have been published, it is rather difficult for

a process modeler or a researcher to find out which published patterns could be helpful in a given situation. There are two reasons for this:

First, relevant publications can be found in a great variety of proceedings, journals and web sites. For certain types of patterns, compilations of the patterns and related work can be found on the web. The most remarkable web site is <http://www.workflowpatterns.com>, which is a great resource for getting familiar with a certain kind of business process model patterns. However, this site is restricted to “low-level” patterns that describe the basic building blocks that a workflow engine or process modeling language should support. Prior to our work, no single resource existed that provides an entry point for searching the full spectrum of BPM pattern papers.

And second, patterns dealing with the same topic are not named in a unified way. For example, patterns dealing with adaption and change between model variants are called *change patterns* [10], *adaption patterns* [3], *variability design patterns* [12], *high-level change operations* [8] or just *differences* [2] by different authors.

To overcome the second problem, we suggested a taxonomy for BPM patterns [4] and anti-patterns [7]. For this purpose, we conducted an extensive literature review, followed by a classification of 89 papers on BPM patterns and 48 papers on anti-patterns. Details can be found in our mentioned publications.

Once having the literature overview as well as the classification, it was our aim to provide a starting point for the search for business process modeling patterns that can be used by practitioners and researchers. The result – our interactive pattern catalog <http://www.bpmpatterns.org> – will be presented in this paper.

## 2 Target Audience and Use Cases

The tool is intended to serve both researchers as practitioners.

The benefit for researchers who want to get an overview over existing work is that they can easily get access to the existing literature despite the problem that different authors use a different terminology.

The same is true for people who aim to publish an own pattern paper. For this kind of publications, a paragraph “Related Patterns” is usually an important part of a pattern documentation. Our catalog provides access to these patterns and allows to put the own publication into context. While we do not recommend to use the pattern catalog as the only source for searching the literature, we are convinced that it is a good starting point to locate relevant references quickly.

The second target audience are practitioners who want to model a common situation in a good manner. For example, take the requirement to model an approval process where several roles must agree before approval will be granted. Without any doubt, this is a frequently occurring situation. It would be nice to reuse an existing solution that has been published as a pattern.

The typical way to search for such a pattern would be to use a search engine, e.g. *Google* or *Google Scholar* with a query such as `approval AND pattern`

AND (workflow\* OR "business process"). Unfortunately, neither of the mentioned search engines would list the highly relevant patterns published in “Simplifying the Design of Signature Workflow with Patterns” [6] among the first ten results pages. It is rather unlikely, that a practitioner would expand the search after reading more than 10 result pages from the favourite search engine.

In our catalog, this paper (and others relating to model a approval process) can be found immediately by searching for “approval”, as well as by searching for synonyms such as “permission”, “authorization” (or “authorisation”), etc.

### 3 The Interactive Pattern Catalog

The online catalog at <http://www.bpmpatterns.org> provides an overview of the published literature on BPM patterns. If possible, each entry directly links to the original paper. There are several ways to access the catalog:

*By browsing the (anti-)pattern taxonomy* As can be seen in Fig. 1, the catalog is organized by topics using a two-level taxonomy for patterns and another one for anti-patterns. Example category names such as “Business Process Compliance”, “Role and Resource Assignment” or “Domain-dependent Content Patterns” give an impression on the broad scope of BPM patterns.



**Fig. 1.** Accessing the Catalog by Browsing the Taxonomy

*By searching for a pattern name* All publications on patterns who have got a name can be found by entering the name in the search field. Fig. 2 shows the result when searching for the pattern name “Structured Loop” (which is one of the well-known workflow patterns). The search results in Fig. 2 illustrates a decision that has been made when selecting the literature represented in the catalog. While the paper “Workflow Control-Flow Patterns: A Revised View” [9] is represented, older papers such as [11] or works discussing how modeling languages support workflow patters were deliberately not included. It was not our aim to create a catalog that contains metadata for all publications which mention pattern in the area of business process modeling. Rather, it was our aim to establish a concise reference of all those papers where the original pattern definitions can be found.

Up to now, 1444 names of patterns and anti-patterns are currently included in the catalog.

Title	Download	Year
A pattern-based approach for the verification of business process descriptions		2013
Condition-based process patterns for modeling of human processes in Knowledge-intensive Business Services		2010
Workflow Control-Flow Patterns: A Revised View		2006

**Fig. 2.** Searching for a Pattern Name

*By searching for properties or keywords* It is also possible to search the catalog according to various aspects. For example, it is possible to search for patterns that are relevant to a given modeling language only. In addition, 1064 keywords have been manually added to the papers. This addresses the fact that in the pattern literature it is not uncommon that different phrases are used for indicating the same concepts. Fig. 3 shows the first lines of the search results when searching for the keyword “soundness” among the literature on anti-patterns.

Title	Download	Year
A Heuristic Method for Detecting Problems in Business Process Models		2010
A Novel Graph Reduction Algorithm to Identify Structural Conflicts		2002
An Analysis and Taxonomy of Unstructured Workflows		2005
Definition and Detection of Control-flow Anti-Patterns in Process Models		2013
Definition of Deadlock Patterns for Business Processes Workflow Models		1999
Definition of Deadlock Patterns for Business Processes Workflow Models		1999
Detection of Anti-Patterns in the Control Flow of Collaborative Business Processes.		2015
Formal Based Correctness Check for ePASS- IoS 1.1 Process Models with Integrated User Support for Error Correcting		2014
Good and Bad Excuses for Unstructured Business Process Models		2007

**Fig. 3.** Keyword Search at <http://www.bmpatterns.org>

## 4 Outlook

It is our aim to keep the bibliography our pattern catalog up-to-date by adding further pattern papers. Currently, the online catalog already contains references to pattern papers that are not yet included into our literature surveys [4,7].

Therefore, we will be grateful for being informed about any new work in this area. We will be glad to add any relevant work that will be published in the future. We hope that <http://www.bmpatterns.org> will become a starting point for everyone who is interested in learning about business process modeling patterns.

## 5 Tutorial

While we hope that the catalog at <http://www.bpmpatterns.org> can be used in an intuitive way, a short text tutorial can be found at <http://www.bpmpatterns.org/files/tutorial.pdf>

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