Design pattern catalogue

Every abstraction and design pattern of the Exponential 6 stack, found in the source code: 6206 instances in 29 categories across kernel, lib and extensions, with file, class, description and extension point.

Source file: `doc/eng-us/standards/patterns/README.md` Last changed 2026-11-04
https://doc.exponential.earth/learninminutes/exphelp/viewer/standards/patterns/README.md

This catalogue is for developers who extend Exponential or change its kernel. It lists every abstraction the code uses, where it is, and how a new implementation is plugged in, so that new code follows the patterns that are already there instead of inventing new ones. It is generated from the source code, so it is complete and current for the code it was built from; the rules that recognize each pattern are heuristic and are explained below.

Runnable examples of most of these extension points: Examples and the cookbook.

The rules the code follows: Standards and Kernel architecture.

In numbers

Instances (all categories)	6206
Classes, interfaces, traits and enums	3516 (3419 classes, 96 interfaces, 1 trait)
... with at least one pattern	2871
Module views	532
Policy functions	260
Fetch functions	316
Template operators	255
Cronjob parts	49
Event hooks	99
INI plugin points	842
Source files read	4512 PHP, 577 INI
Areas	155

The patterns

Pattern	Group	Instances	Recognized by
Active Record (eZPersistentObject)	Data access	234	Extends eZPersistentObject, directly or through a parent class.
Datatype (Strategy for content fields)	Plugins	54	Extends eZDataType, directly or through a parent class.
Workflow event type (Command, plugin)	Plugins	15	Extends eZWorkflowEventType.

Pattern	Group	Instances	Recognized by
Template operator (Interpreter plugin)	Plugins	338	Registered in an eztemplateautoload.php ($eZTemplateOperatorArray[]), or has operatorList() and modify().
Template function (Interpreter plugin)	Plugins	45	Registered in an eztemplateautoload.php ($eZTemplateFunctionArray[]), or has functionList() and process().
Fetch function (Query Object, Facade)	Plugins	354	An entry of a module's function_definition.php, or a class named *FunctionCollection.
Module view (Page Controller)	Request handling	993	An entry of $ViewList in a module.php, or a class that extends ModuleView or Page (the runnable form of a view).
Policy function (access control)	Request handling	260	An entry of $FunctionList in a module.php.
Front Controller	Request handling	10	The kernel classes ezpKernel, ezpKernelWeb, ezpKernelTreeMenu, ezpKernelRest, eZModule and their kind.
Command (console, scripts, cronjobs)	Request handling	247	Extends Command, CronjobPart or Runnable (the runnable console commands and cronjob parts), or a cronjobs/*.php file.
Singleton / instance()	Creation	77	Has a static instance() or getInstance() method.
Factory and static factory methods	Creation	443	Class name ends in Factory, or has static create*(), from*(), factory(), make*() methods, or creates new self/new static in a static method.
Builder	Creation	10	Class name contains Builder or Generator.
Registry	Structure	39	Class name contains Registry, or has static register*() methods.
Strategy / handler	Behavior	382	Class name ends in Handler, Backend, Driver, Transport, Engine or Strategy, or implements an interface whose name does.
Template Method / abstract base class	Behavior	69	An abstract class with both abstract and concrete methods.
Interface (contract)	Structure	96	Every interface.
Observer / listener / event	Behavior	10	Class name contains Listener, Observer or Subscriber, or has attach()/notify()/addListener() methods; every ezpEvent notify()/filter() call (see the hooks page).
Event hook (ezpEvent)	Behavior	99	A call of ezpEvent::getInstance()->notify('EVENT') or ->filter('EVENT').
Adapter / bridge / wrapper	Structure	6	Class name contains Adapter, Bridge, Wrapper or Proxy.
Facade / service	Structure	40	Class name ends in Facade, Service, Manager, API or Api.
Decorator / filter	Structure	64	Class name contains Decorator or Filter.
Chain of Responsibility	Behavior	19	Class name contains LoginHandler, Chain, Pipeline, Middleware, Router or Matcher.
Iterator	Behavior	16	Implements Iterator, IteratorAggregate or ArrayAccess.

Pattern	Group	Instances	Recognized by
Value object / struct	Structure	106	Class name ends in Struct, Value, Result, Item, Info or Definition and the class has few methods, or extends ezcBaseStruct.
Exception hierarchy	Structure	73	Extends Exception, an *Exception class or Error.
Trait (mixin)	Structure	1	Every trait.
Utility (static helper)	Structure	730	A concrete class whose methods are all static (at least two).
INI plugin point (extension point)	Plugins	1376	A setting of a settings/*.ini file (or an extension's) whose value is the name of a class of the catalogue.

The areas

One page per part of the code base: every class with its patterns, and the views, functions, operators and plugin points defined there.

Area	Classes	Views	Fetch functions	Operators	Plugin points
extension/AdminAid	1	6	0	0	18
extension/autorss	2	0	0	0	0
extension/bccie	48	5	0	0	44
extension/bcgooglesitemaps	4	1	0	0	0
extension/bcwebsitestatistics	4	0	0	6	0
extension/birthday	4	0	0	0	1
extension/cjw_newsletter	197	57	16	13	21
extension/cjw_themes_jumper	6	2	0	0	2
extension/cjw_tmv	7	0	4	0	1
extension/enhancedezbinaryfile	3	0	0	1	0
extension/enhancedselection2	6	0	0	0	1
extension/expai	186	9	12	6	69
extension/expchangeclass	7	3	1	0	3
extension/exphelpsite	1	0	0	0	0
extension/expimageeditor	5	1	1	0	0
extension/explayouts	150	9	9	0	85
extension/explayouts_api	10	0	0	0	0
extension/explayouts_content_browser	4	0	0	0	0
extension/explayouts_content_browser_core	3	0	0	0	1
extension/explayouts_content_browser_ui	2	1	0	0	0
extension/explayouts_core	13	0	0	0	1
extension/explayouts_relation_list_query	4	0	0	0	0

Area	Classes	Views	Fetch functions	Operators	Plugin points
extension/explayouts_site_api	6	0	0	0	0
extension/explayouts_standard	23	0	0	0	0
extension/explayouts_tags_query	2	0	0	0	0
extension/explayouts_ui	20	14	0	1	0
extension/explayouts_ui_api	6	4	0	0	0
extension/expquery_translator	53	0	0	0	0
extension/expqueue	27	5	0	0	5
extension/expservices	78	0	0	0	69
extension/expsite_api	7	0	0	0	0
extension/expsite_app	2	0	0	0	0
extension/expsite_core	4	0	0	0	0
extension/expsite_data_media	2	0	0	0	0
extension/expsite_installer	2	0	0	0	0
extension/expui	4	0	0	1	1
extension/exp_adminui	1	0	0	0	0
extension/exp_enhanced_link	3	0	0	0	0
extension/exp_oe_tiptap	14	1	0	0	3
extension/ezauthorize	5	2	0	0	0
extension/ezautosave	2	0	0	0	1
extension/ezdemo	5	0	0	6	0
extension/ezfind	51	3	7	2	8
extension/ezflow	28	8	6	5	6
extension/ezformtoken	1	0	0	0	0
extension/ezgmaplocation	4	0	0	0	1
extension/ezie	32	13	0	0	0
extension/ezjscore	21	3	0	12	11
extension/ezmbpaex	4	2	0	0	0
extension/ezmultiupload	8	2	3	0	0
extension/ezodf	39	11	0	0	14
extension/ezoe	26	8	0	1	7
extension/ezoracle	8	0	0	0	3
extension/ezownerchange	5	1	0	0	1
extension/ezpaypal	4	1	0	0	0
extension/ezpm	5	12	4	0	0

Area	Classes	Views	Fetch functions	Operators	Plugin points
extension/ezpostgresqlcluster	2	0	0	0	0
extension/ezprestapi	9	0	0	0	2
extension/ezprestapiprovider	2	0	0	0	2
extension/ezssp	2	0	0	0	0
extension/ezstarrating	8	0	0	3	2
extension/eztags	32	17	9	5	7
extension/ezupdate	17	0	0	0	0
extension/ezurlmultisite	8	0	0	13	4
extension/ezwebin	1	0	0	6	0
extension/ezwt	5	1	0	1	1
extension/git_manager	23	0	0	0	1
extension/hcaptcha	5	0	0	0	0
extension/ngclasslist	2	0	0	0	0
extension/nxc_powercontent	6	40	56	0	0
extension/owsimpleoperator	5	0	0	0	0
extension/powercontent	3	1	0	0	0
extension/recaptcha	4	0	0	0	0
extension/sevenx_authentication_2fa	21	4	0	0	1
extension/sevenx_dse	53	0	0	0	0
extension/sevenx_themes_media	7	2	0	0	3
extension/sevenx_themes_simple	1	0	0	0	16
extension/sevenx_themes_super	1	0	0	0	0
extension/sqliimport	203	20	3	0	135
extension/str_replace	2	0	0	1	0
extension/swark	43	0	0	0	0
extension/syndication	34	13	0	0	1
extension/xrowextract	94	9	2	0	35
extension/xrowmetadata	38	2	0	7	1
kernel/classes	217	0	0	0	0
kernel/classes/apikey	3	0	0	0	0
kernel/classes/audit	54	0	0	0	0
kernel/classes/basketinfohandlers	1	0	0	0	0
kernel/classes/binaryhandlers	1	0	0	0	0
kernel/classes/classicmenu	2	0	0	0	0

Area	Classes	Views	Fetch functions	Operators	Plugin points
kernel/classes/clusterfilehandlers	2	0	0	0	0
kernel/classes/collaborationhandlers	1	0	0	0	0
kernel/classes/confirmorderhandlers	1	0	0	0	0
kernel/classes/contentcheck	13	0	0	0	0
kernel/classes/contentfinder	3	0	0	0	0
kernel/classes/contentjob	20	0	0	0	0
kernel/classes/datatable	19	0	0	0	0
kernel/classes/datatypes	81	0	0	0	0
kernel/classes/debugbar	8	0	0	0	0
kernel/classes/help	57	0	0	0	0
kernel/classes/i18n	1	0	0	0	0
kernel/classes/ini	32	0	0	0	0
kernel/classes/logviewer	19	0	0	0	0
kernel/classes/mail	1	0	0	0	0
kernel/classes/mailpreferences	18	0	0	0	0
kernel/classes/notification	19	0	0	0	0
kernel/classes/packagecreators	4	0	0	0	0
kernel/classes/packagehandlers	7	0	0	0	0
kernel/classes/packageinstallers	2	0	0	0	0
kernel/classes/passkey	5	0	0	0	0
kernel/classes/pdfexport	4	0	0	0	0
kernel/classes/reauth	5	0	0	0	0
kernel/classes/requestclassifier	12	0	0	0	0
kernel/classes/requestlog	1	0	0	0	0
kernel/classes/role	3	0	0	0	0
kernel/classes/secrets	3	0	0	0	0
kernel/classes/shopaccounthandlers	4	0	0	0	0
kernel/classes/subitems	24	0	0	0	0
kernel/classes/syscard	25	0	0	0	0
kernel/classes/transfer	10	0	0	0	0
kernel/classes/uiswitch	6	0	0	0	0
kernel/classes/user	14	0	0	0	0
kernel/classes/vathandlers	1	0	0	0	0
kernel/classes/webauthn	4	0	0	0	0

Area	Classes	Views	Fetch functions	Operators	Plugin points
kernel/classes/workflowtypes	11	0	0	0	0
kernel/common	26	0	0	48	0
kernel/modules	78	231	182	0	0
kernel/private	181	8	1	1	0
kernel/private/classes/asynchronouspublisheroutput	2	0	0	0	0
kernel/private/classes/clusterfilehandlers	14	0	0	0	0
kernel/private/classes/commands	105	0	0	0	0
kernel/private/classes/cronjobs	30	0	0	0	0
kernel/private/classes/exceptions	14	0	0	0	0
kernel/private/classes/httpcache	2	0	0	0	0
kernel/private/classes/requestrules	44	0	0	0	0
kernel/private/classes/runnable	4	0	0	0	0
kernel/private/classes/services	8	0	0	0	0
kernel/private/classes/urlaliasfilters	1	0	0	0	0
kernel/private/classes/views	272	0	0	0	0
kernel/private/classes/webdav	3	0	0	0	0
lib	2	0	0	0	0
lib/ezdb	11	0	0	0	0
lib/ezdbschema	8	0	0	0	0
lib/ezdiff	10	0	0	0	0
lib/ezfile	13	0	0	0	0
lib/ezi18n	22	0	0	0	0
lib/ezimage	16	0	0	0	0
lib/ezlocale	6	0	0	0	0
lib/ezmath	2	0	0	0	0
lib/ezpdf	5	0	0	1	0
lib/ezsession	6	0	0	0	0
lib/ezsoap	10	0	0	0	0
lib/eztemplate	56	0	0	115	0
lib/ezutils	47	0	0	0	0
settings	0	0	0	0	254

What was read

The git-tracked PHP and INI files below `kernel/`, `lib/` and `extension/` of the Exponential repository (tests and `vendor/` directories left out), and these extensions:

Extension	Source
AdminAid	its own repository
autorss	Composer package
bccie	Composer package
bcgooglesitemaps	Composer package
bcwebsitestatistics	Composer package
birthday	Composer package
cjw_newsletter	Composer package
cjw_themes_jumper	its own repository
cjw_tmv	its own repository
enhancedezbinaryfile	Composer package
enhancedselection2	Composer package
exp_adminui	its own repository
exp_enhanced_link	Composer package
exp_oe_tiptap	its own repository
expai	its own repository
expchangeclass	its own repository
exphelpsite	shipped with the kernel
expimageeditor	shipped with the kernel
explayouts	its own repository
explayouts_api	its own repository
explayouts_content_browser	its own repository
explayouts_content_browser_core	its own repository
explayouts_content_browser_ui	its own repository
explayouts_core	its own repository
explayouts_relation_list_query	its own repository
explayouts_site_api	its own repository
explayouts_standard	its own repository
explayouts_tags_query	its own repository
explayouts_ui	its own repository
explayouts_ui_api	its own repository
expquery_translator	its own repository
expqueue	its own repository

Extension	Source
expservices	shipped with the kernel
expsite_api	its own repository
expsite_app	its own repository
expsite_core	its own repository
expsite_data_media	its own repository
expsite_installer	its own repository
expui	its own repository
ezauthorize	Composer package
ezautosave	Composer package
ezdemo	Composer package
ezfind	its own repository
ezflow	Composer package
ezformtoken	shipped with the kernel
ezgmaplocation	Composer package
ezie	Composer package
ezjscore	shipped with the kernel
ezmbpaex	Composer package
ezmultiupload	Composer package
ezodf	Composer package
ezoe	shipped with the kernel
ezoracle	its own repository
ezownerchange	its own repository
ezpaypal	Composer package
ezpm	Composer package
ezpostgresqlcluster	Composer package
ezprestapi	Composer package
ezprestapiprovider	Composer package
ezssp	Composer package
ezstarrating	Composer package
eztags	Composer package
ezupdate	Composer package
ezurlmultisite	its own repository
ezwebin	Composer package
ezwt	Composer package
git_manager	Composer package

Extension	Source
hcaptcha	Composer package
ngclasslist	Composer package
nxc_powercontent	Composer package
owsimpleoperator	Composer package
powercontent	its own repository
recaptcha	Composer package
sevenx_authentication_2fa	its own repository
sevenx_dse	its own repository
sevenx_themes_media	its own repository
sevenx_themes_simple	Composer package
sevenx_themes_super	Composer package
sqliimport	its own repository
str_replace	Composer package
swark	Composer package
syndication	Composer package
xrowextract	Composer package
xrowmetadata	Composer package

An extension is read when it is a git repository of its own below `extension/` whose origin is a se7enxweb repository, or a Composer package of se7enxweb installed there; private extensions and site settings are never read. A site that has other extensions installed gets a larger catalogue when it runs the generator.

How the catalogue is built

Run in the installation root (no database, nothing is loaded or executed; PHP's tokenizer reads the files):

Shell

```
php bin/php/exppatterncatalogue.php            # report which pages would change
php bin/php/exppatterncatalogue.php --write    # write doc/eng-us/standards/patterns/
php bin/php/exppatterncatalogue.php --check    # exit 1 when the pages are out of date
```

The output depends only on the source: no dates, no commit ids, everything sorted, so a second run on the same code writes the same bytes. Commit the pages with the code change that changes them.

Each category has a rule (the table above and each pattern's page). A class can match several categories. The rules use the class's name, its parent classes and interfaces (followed through the whole code base), its methods (static, abstract) and the registration files of the kernel: `module.php` (views and policy functions), `function_definition.php` (fetch functions), `eztemplateautoload.php` (template operators and functions), `cronjobs/` directories, `ezpEvent` calls and INI settings whose value is a class name. Names are a heuristic: a class called

`...Manager` is listed as a facade or service even when it is something else, and a pattern implemented without the usual names is missed. Descriptions are the first sentence of each class's doc comment.

> **Note**
>
> The catalogue describes the code as it is, including inherited code. It is not a list of recommendations: for new code, follow the layering and naming rules.

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