Separation of concerns (Single Responsibility Principle) in Rails

Separation of concerns is one of the key goals of software development. It deals with good maintainance pattern. For this to be, every change have to be local. Then programmer has to separate things, the more he can do, avoiding bounded code.

To achieve this, he has to :

- **Separate out the things that change from those that stay the same**.
- **Program to an interface, not an implementation** : roughly speaking, code doesn't have to know which kind of object it deals with. Here duck typing is the king. The only thing you have to think of is building a good interface (a good "langage" to throw messages from one component to another). To conceive an interface, you have to think about the more general thing : car < vehicule < movable object. Best think about movable object.
- **Prefer composition over inheritance** : think about what your object has rather than what it is. And everything it has have to be another object.
- **Delegate, delegate, delegate** : your car doesn't start its engine, it says to its engine to start!
- **YAGNI** : you ain't gonna need it ! Do not anticipate what the future will be. Because doing this can lead you to a point from where the evolution to the actual future can be harder. You can't predict where the code will have to go...

So here I am to apply all this advices/goals in a rails app.

Rails components

Controller

The central component. It is the part interacting with the browser, receiving http requests and responding by a content. Does it have to know about database structure ? No. This doesn't mean it doesn't have to deal with ActiveRecord instances. Does it have to know about how to deal with the sql request ? No. It has to know who has to deal with the actual use case and which message have to be sent to it. Then it has to return the accurate response (depending of use-case return).

View

Does it have to know about database structure ? No. It has to know about what has to be displayed. So it has to receive something that is built from the database to respond to what needs to be displayed.

Model (ActiveRecord object)

Does it have to know about which kind of manipulation data are subject to ? Yes/No. This is what all this paper is about. It deals with storing to -- and validating -- and reading (performing requests) from database.

Who have to make a given action

Delegate, delegate, delegate rule applied to controller, tells us that it should only distribute the work to be done upon the right workers.

So controller have to send messages, but it doesn't manage how things have to be done. This is not its job.

I think I can divide the workflow in a few tasks.

- Processing POST, PATCH or DELETE actions,
- Querying model to get needed informations,
- Presenting these informations for view usage,
- Handling actions that have nothing to do with data persistence or display (services)

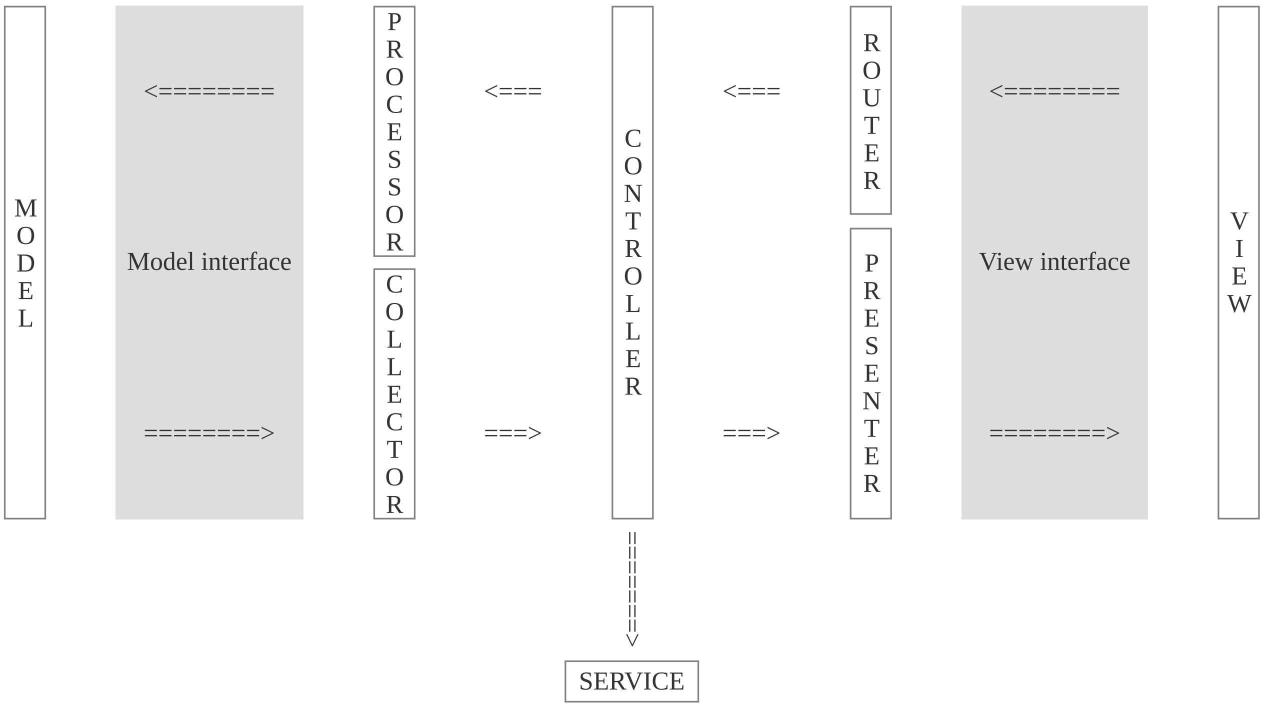
My solution

After a lot of tries, I finally decided that my good way of doing things is :

- to provide Processor classes to perform complex database mutations.
- to provide Collector classes to performs complex queries. Hence, model only contains validations and basic scoping methods.
- to provide Presenter modules as interfaces between query results and views. As mixins, they decorate the object returned by the query (which is eventually not a model instance or list...)

Conventional names : `InputsCollector` , `InputsProcessor` . Concerning presenters, beside eventual `InputsPresenter` we could find `IndexPresenter` and so on.

Separation of concerns :



Final tree and ApplicationRecord extension

```
app
├── collectors
│   └── inputs_collector.rb
├── lib
│   ├── collector.rb
│   ├── presenting.rb
│   └── processor.rb
├── presenters
│   ├── index_presenter.rb
│   └── inputs_presenter.rb
├── processors
│   └── inputs_processor.rb
```

Controllers

A way to handle parameter permissions from controllers :

```
# app/controllers/application_controller.rb
class ApplicationController < ActionController::Base
  def permitted_params
    model = self.controller_name.singularize
    params.require( model.to_sym ).permit(
      Object.const_get( model.camelize ).permitted_params
    )
  end
end

# app/models/stay.rb
class Stay < ApplicationRecord
  def self.permitted_params
    [ :title, :name, :whatever ]
  end
end
```

No more need for a `stay_params` method... You may define a `permitted_params` method to override this default behaviour.

Typical controller methods

Here typical controller methods calling a processor and/or a presenter.

```
def create
  @stay = Stay.new( permitted_params ).extend( StaysPresenter )

  unless StaysProcessor.do create: @stay, with: { hash_context }
    render :new, status: :see_other and return
  end
  flash[:notice] = 'Successfully created!'
end

def index
  @inputs = InputsCollector.query_for :index, with: { period: current_period }

  @inputs.extend IndexPresenter::Iterator
  # or @inputs.map { |input| input.extend StaysPresenter }
end
```

Another object ?

In big apps it could be interesting that controller build a « context » object to be given as parameter to processor and collector. This context has to contain all the contextual stuff (like session hash, etc.). Context object could be a Struct. which could be questionned : `context.current_user` , `context.stay_id` , `context.stay` , etc.

Then a typical call will be :

```
StaysProcessor.do create: @input, with: context
```

with context being a controller callback..

Base modules and classes

```ruby
# app/lib/processor.rb
# A base class for all processors.
# Every subclasses are provided a standard syntax :
# InputsProcessor.do create: @input, with: { budget_id: 1, profile: 2 }
# or
# BudgetsProcessor.do :create, with: { user: current_user }
# Both defining instance variables then calling the right method.
class Processor
  class << self
    def do( method = nil, **args )
      method ||= args.keys.first
      model_instance = args.fetch( method, nil )
      context = args.fetch( :with, nil )
      self
        .new( model_instance, context )
        .send( "do_#{method}" )
    end
  end

  def initialize( target, context )
    @target = target
    @context = context
  end
end

# app/lib/collector.rb
# A base class for all collectors.
# Every subclasses are provided a standard syntax :
# InputsCollector.query_for :create, with: { budget_id: 1, profile: 2 }
# defining @context variable then calling query_for_create method
class Collector
  class << self
    def query_for( name, with: {} )
      self
        .new( with )
        .send( "query_for_#{name}" )
    end
  end

  def initialize( context )
    @context = context
  end
end

# app/lib/presenting.rb
module Presenting
  module ClassMethods
    # Syntactic sugar that provide a way to automatically prefix method names.
    def presenting( name, &block )
      define_method "present_#{name.to_s}".to_sym, &block
    end
  end

  def self.included( presenter )
    presenter.extend ClassMethods
  end
end
```

Processor classes

These classes are concerned with « processing » model persistence action. The naming convention for processor methods is `do_xxx` . Processor parent class provide a @target and a @context instance variables.

```
# app/processors/stays_processor.rb
class StaysProcessor < Processor
  def do_update
    @target.update( @context[:params] )
  end
end
```

Collector classes

These classes are concerned with « collecting » data from models. The naming convention is `query_for_xxx` where `xxx` is a controller method (and a view name). A @context instance variable is provided by Collector parent class.

```
# app/collectors/stays_collector.rb
class StaysCollector < Collector

  def query_for_index
    @context[:rental_place].stays.where( "actual_period && ?", @context[:period] )
  end

  def query_for_show
    @context[:rental_place].stays.findbyid( @context.fetch( :id, false ) )
  end
end
```

I think this is a good place to provide defaults value for new records. It could also be achieved inside presenters, but this is not a presentation stuff.

Presenter modules

```
# app/presenters/index_presenter.rb
module IndexPresenter
  include Presenting
  module Iterator
    def each_bay
      self.each do |input|
        input.extend IndexPresenter::Single
        yield input
      end
    end
  end

  module Single
    include Presenting
    presenting :my_specific_title do
      ...
    end
  end
end
```