HOW TO AVOID THE SPAGHETTI CODE MONSTER?

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FUNDAMENTAL LAWS OF SPAGHETTI CODE

1. You **can't understand** it by looking at it.
2. Repetitive code will always fall **out of synchronization**.
3. The work will always gets **harder and slower** as it progresses.
4. Fixing **bugs** creates much more others.
5. You **can't enhanced** the code if you're spending your time fixing the bugs.
6. You have less time to drink **beers** with your friends and to see your kids!
7. You start loosing your hairs!

FREQUENTLY ENCOUNTERED PROBLEMS

1. **Data** Management.

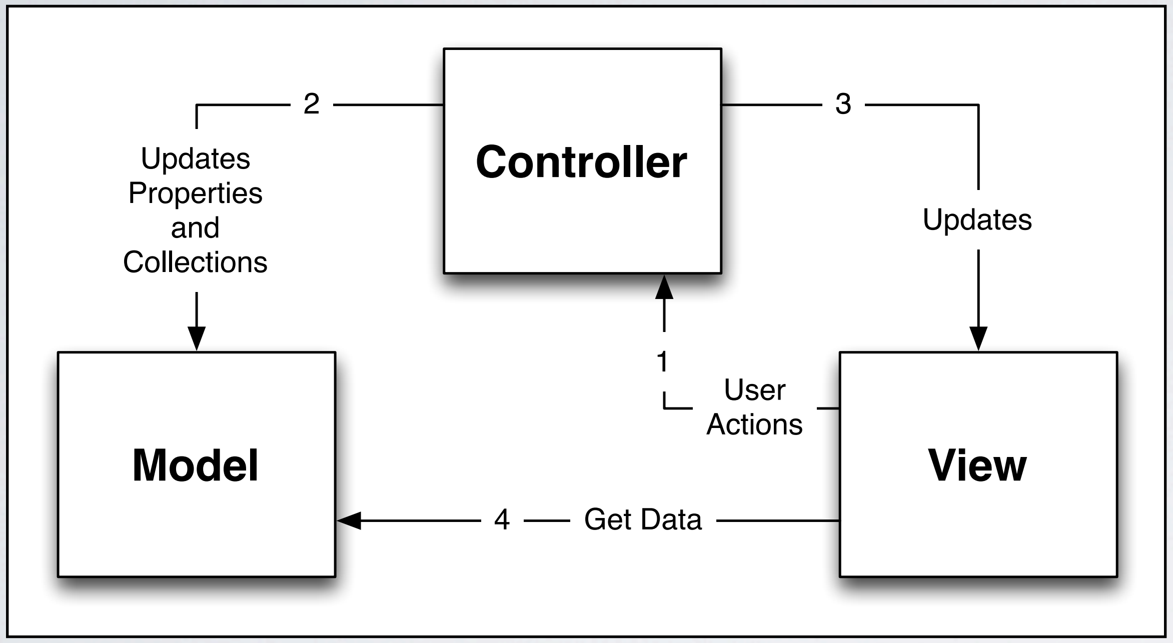
2. Asynchronous Data Updates and Views **Synchronization**.

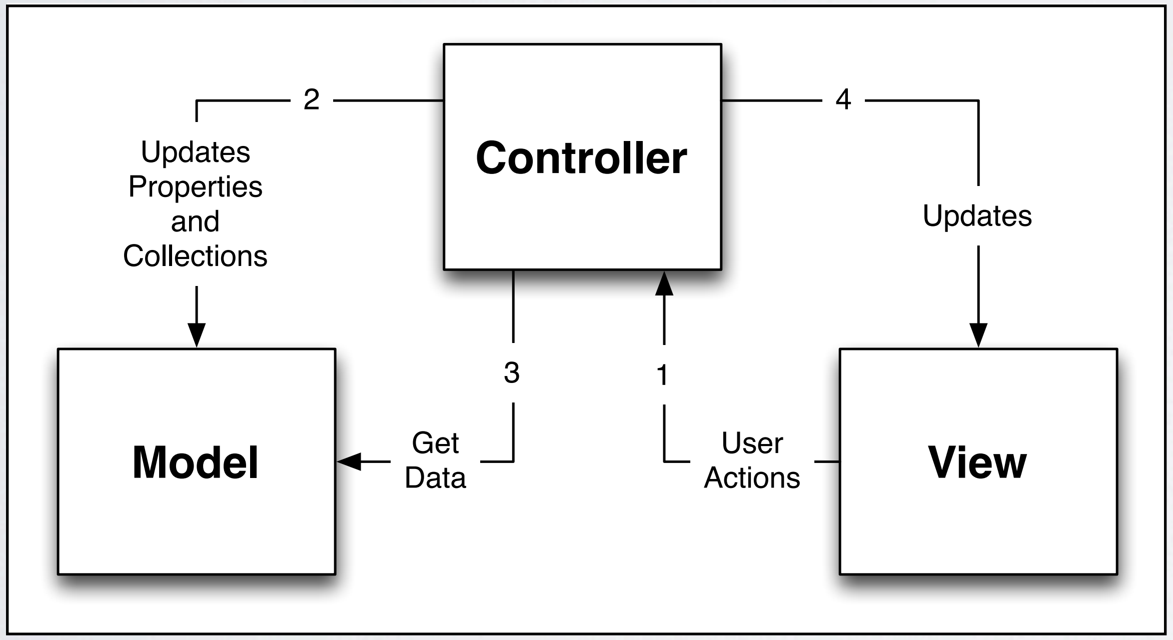
3. **Synchronization** Between Multiple Views representing the same data.

4. **Flow** Management

SEPARATION OF CONCERNS

TWO SAMPLES OF BAD MVC





Lack of Reusability

View is dependent of the model !

Lack of Synchronization

Do not refresh the views directly following user events!

Something is missing ...

THE APPLE GUIDELINES

1. Views and Models are **independent**

2. View Controller is the **Mediator**

3. **Synchronization** between multiple MVC

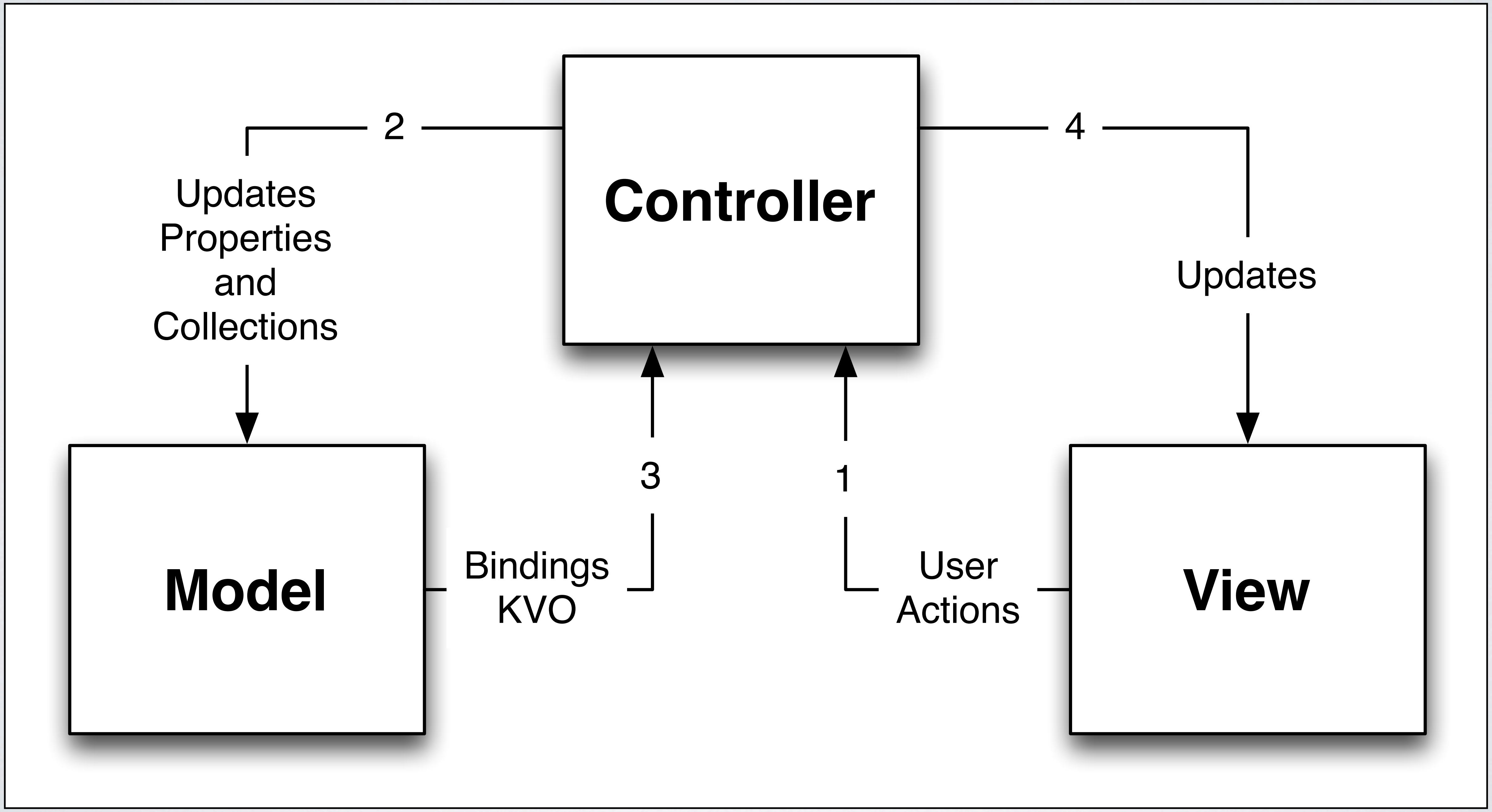
- External Controllers Dependencies : **NEVER**!

- Notification : **NOT PERFECT**!

  We need a **context** associated to the changes to take the right decisions!

- Observers / Bindings : **YES**!

DOCUMENT ORIENTED APPLICATIONS



OBSERVERS IN COCOA

Key Value Observing (KVO)

NSKeyValueObserving Protocol

```
- (void)addObserver:(NSObject *)anObserver forKeyPath:(NSString *)keyPath
            options:(NSKeyValueObservingOptions)options context:(void *)context

- (void)removeObserver:(NSObject *)observer forKeyPath:(NSString *)keyPath
               context:(void *)context

- (void)observeValueForKeyPath:(NSString *)keyPath ofObject:(id)object
                        change:(NSDictionary *)change context:(void *)context
```

```
NSString *const NSKeyValueChangeKindKey;
NSString *const NSKeyValueChangeNewKey;
NSString *const NSKeyValueChangeOldKey;
NSString *const NSKeyValueChangeIndexesKey;
```

To-One relationships Observing property changes

To-Many relationships Observing Collection changes

BINDINGS

Not Available on iOS! **Available in AppCoreKit!**

To-One Relationships

```
@interface NSObject (CKBindings)
- (void)bind:(NSString *)keyPath toObject:(id)object withKeyPath:(NSString *)keyPath;
- (void)bind:(NSString *)keyPath withBlock:(void (^)(id value))block;
@end

@interface UIControl (CKBindings)
- (void)bindEvent:(UIControlEvents)controlEvents withBlock:(void (^)())block;
@end
```

To-Many Relationships

```
@interface CKCollection (CKBindings)

- (void)bindEvent:(CKCollectionBindingEvents)events
        withBlock:(void(^)(CKCollectionBindingEvents event, NSArray* objects,
NSIndexSet* indexes))block;

@end
```

THE PROBLEM IT SOLVES

Synchronizing models and views

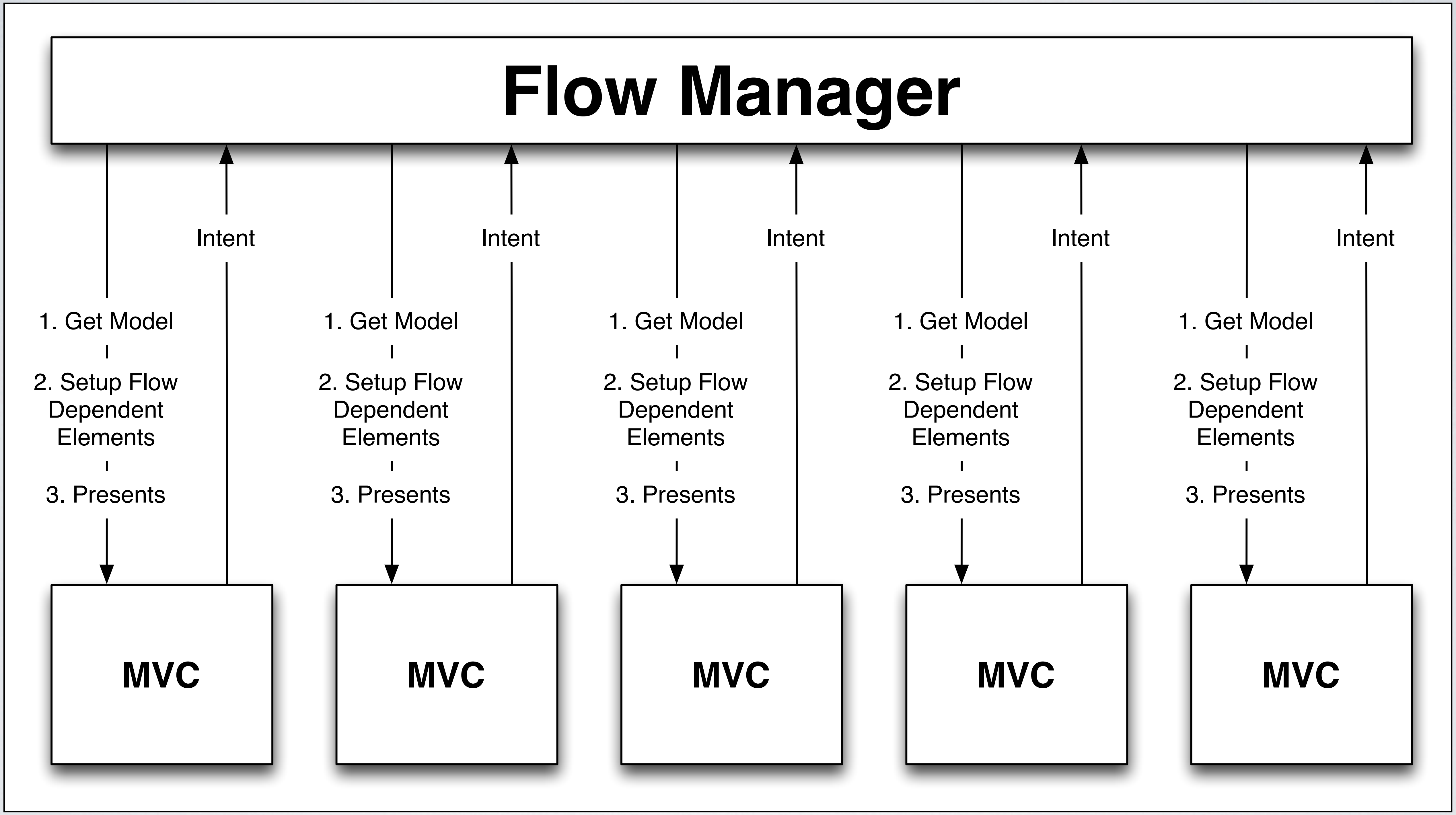
THE PROBLEMS IT DOESN'T SOLVES

Maximizing **Reusability** : Phone vs. Pad

Decoupling **Flow Management**, **Data sources** and **Data Representation**

=> Controllers MUST NOT embed flow dependent logic <=
(Navigation Items, View Controllers Presentation, etc)

We need another Mediator
Flow Manager


Flow Manager
Intent
1. Get Model
2. Setup Flow Dependent Elements
3. Presents
MVC
Intent
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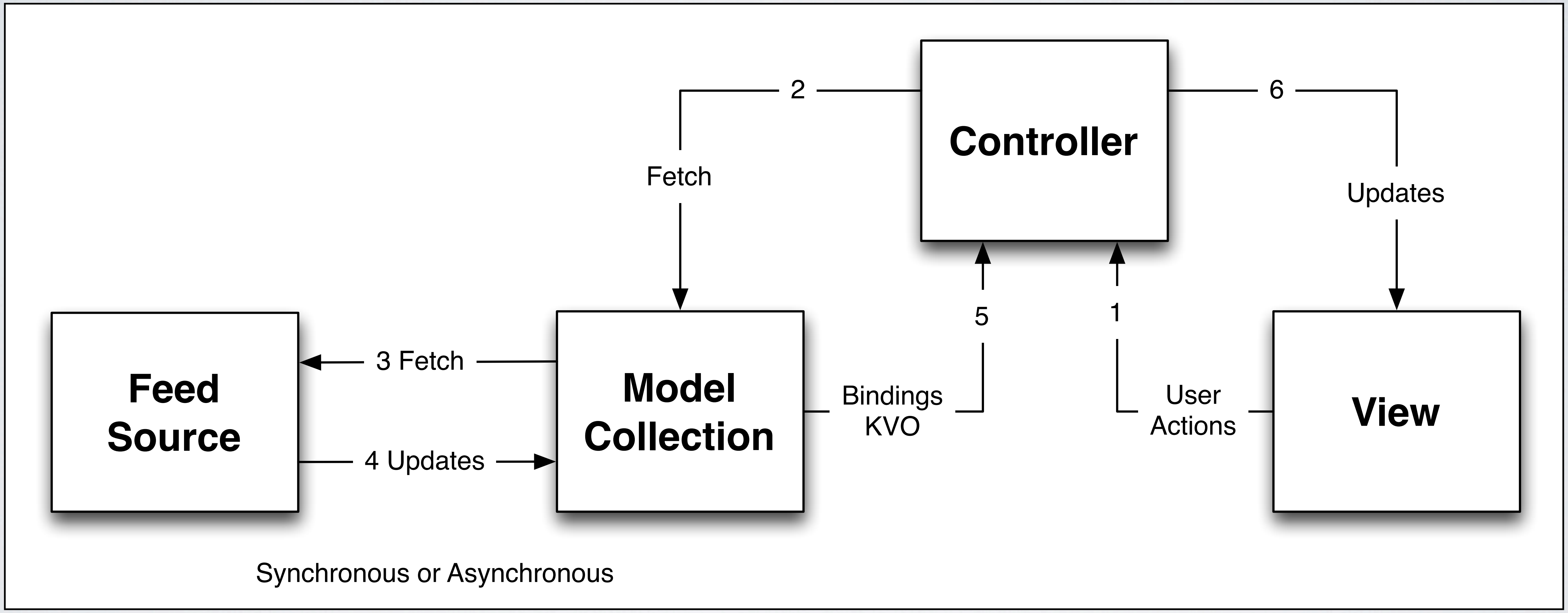
MVC

WORKING WITH REMOTE DATA

1. Representing a remote collection of model objects



Do not pollute the view controller with data requests and transforms !

In The Flow Manager

```
//Get/Create or/and setup The Model
CKFeedSource* myPurposeFeedSource = [WebService feedSourceForMyPurpose];
CKArrayCollection* myCollection   = [CKArrayCollection collectionWithFeedSource:myPurposeFeedSource];

//Creates the controller
CKViewController* controller = [ViewControllerFactory viewControllerForMyPurpose:myCollection
                                                                           intent:^(Intent* intent) {
    switch([intent.event intValue]){
        case PurposeSelectionIntent:{
            [self presentsViewControllerForDetails:intent.object fromViewController:intent.source];
        }
        //...
    }
}];

//Setup the Flow dependent features of the controller

//Presents the controller
```

In The WebService

```
@implementation WebService

+ (CKFeedSource*)feedSourceForMyPurpose{
    CKFeedSource* feedSource = [CKFeedSource feedSource];
    feedSource.fetchBlock = ^(CKFeedSource* feedSource, NSRange range){
        //Request the remote data in range Synchronously or Asynchronously
        //On Completion
        //    => Transforms the results to a collection of model objects
        //    => [feedSource insertItems:TheModelObjects];
    };
    return feedSource;
}

@end
```

WORKING WITH REMOTE DATA

2. Requesting more details for an object

```
@implementation WebService

+ (void)performRequestForDetails:(MyObject*)object
                      completion:(void(^)(MyObject* object, NSError* error))completionBlock{
    //Request the remote data in range Synchronously or Asynchronously
    //On Completion
    //    => Maps the result in the object's properties
    //    => calls the completionBlock with the object and potential errors
}

@end
```

Controllers are binded to this object’s properties
They will refresh automatically when mapping the results

SAMPLE TWITTER CLIENT

https://github.com/smorel/CocoaHeads-Avoiding-Spaghetti-Code

Made with APPCOREKIT

http://appcorekit.net/

CONCLUSION

Do Not forget to:

- Focus on decoupling.
- Always build with reuse, synchronization and separation of concerns in mind.
- Organizes your models to help you represent it (Presentation Models vs. Business Models).
- Mock your data with fake data sources waiting for API's to be ready.

Multiple Advantages:

- Reduces side effects of "minor changes".
- Team Work & Productivity.
- Code is Simple, Readable, Comprehensible, Homogenous.

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