Practical MVP and MVVM Patterns for your iOS Apps

CodeMash 2017

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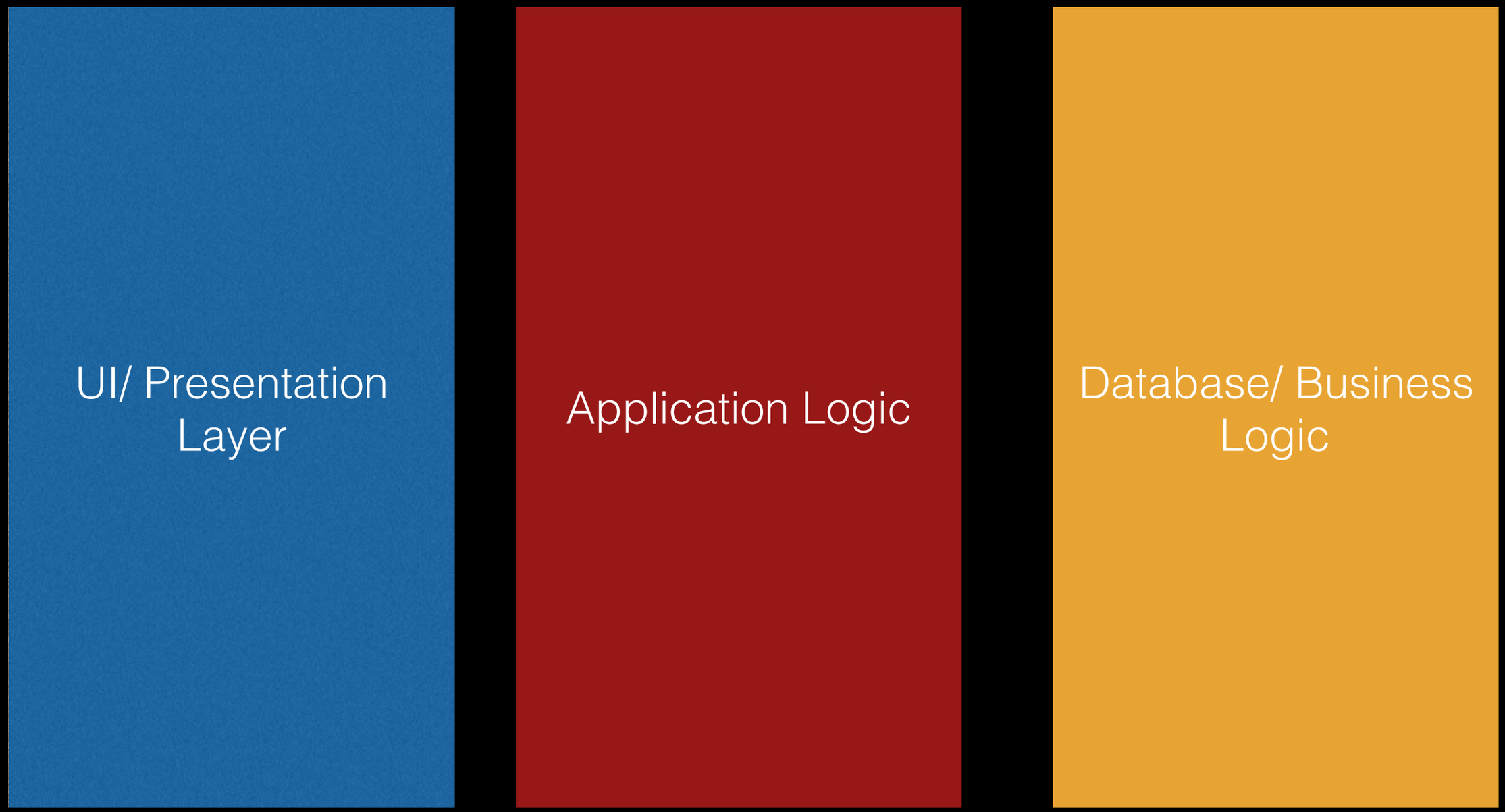
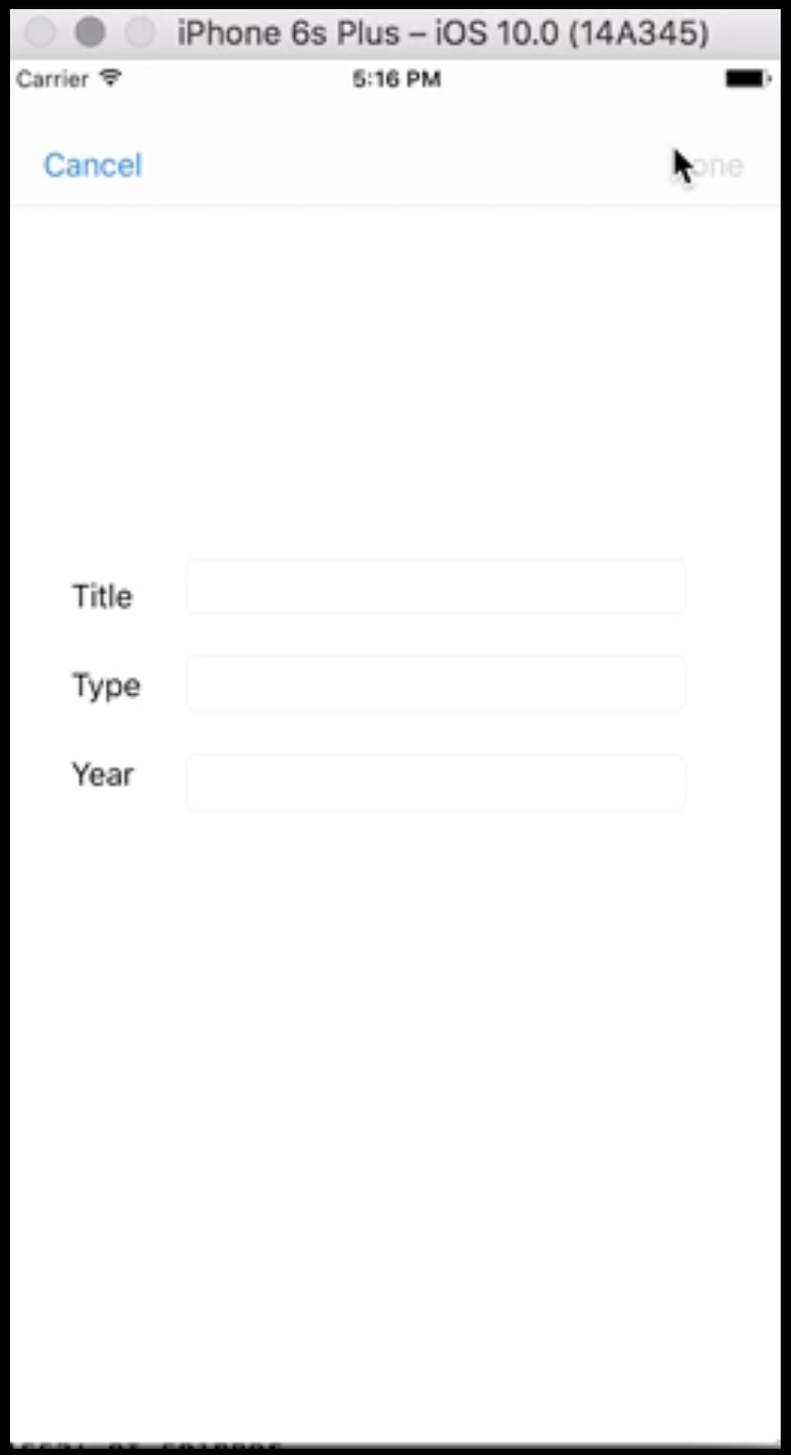
Software Pattern

- Template to solve a repeatable problem
- Architectural Patterns
- Design Patterns

App Architecture



MovieBuff - Demo



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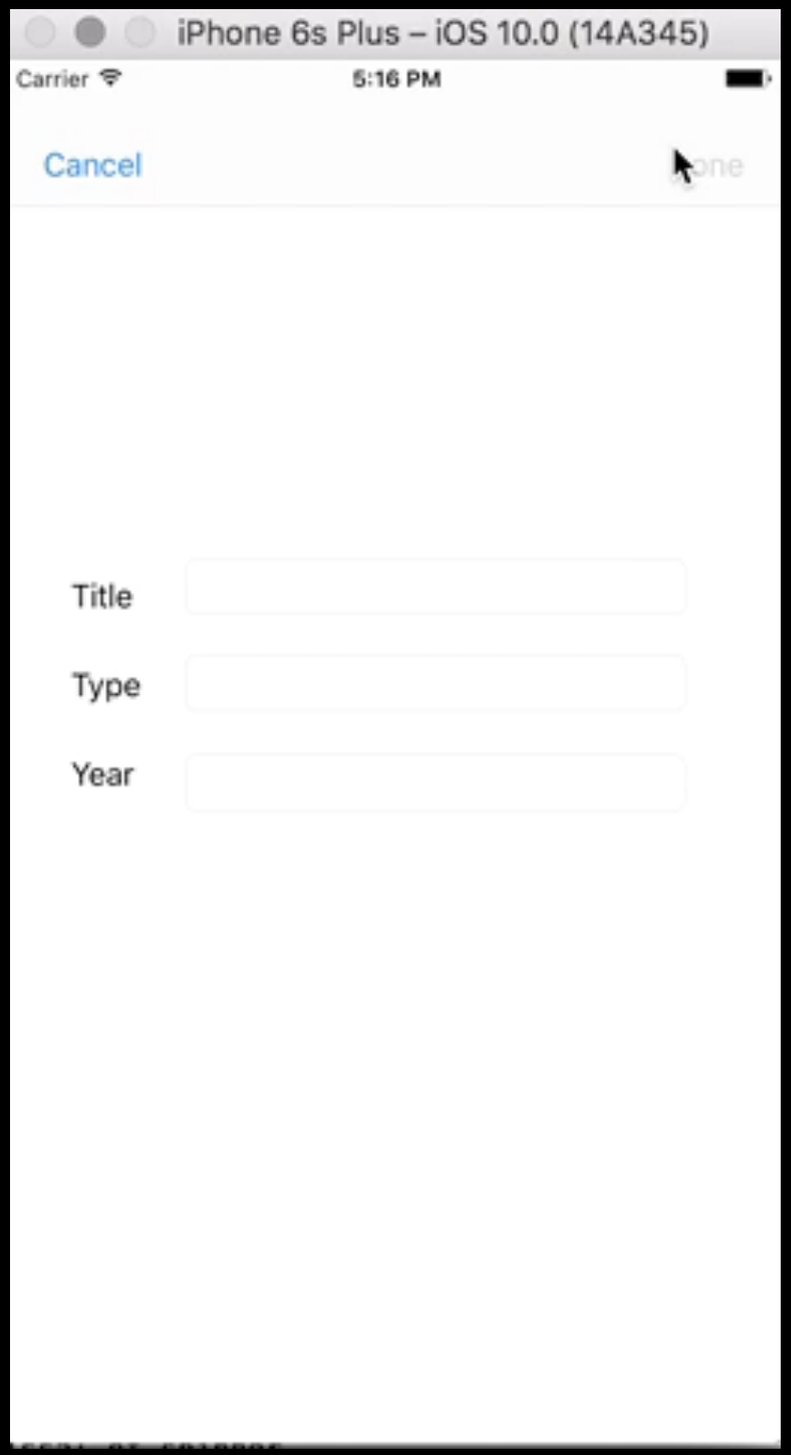
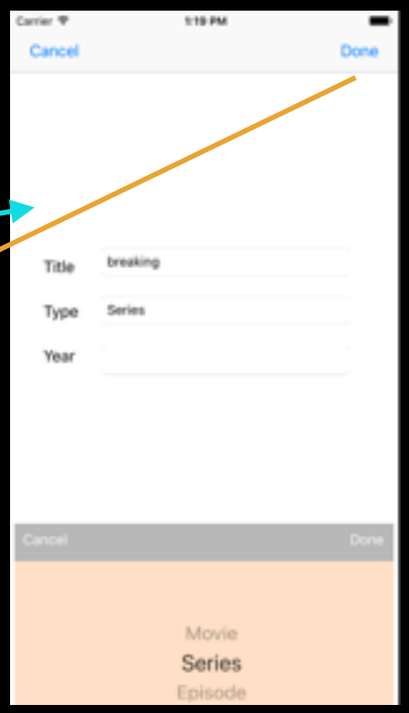
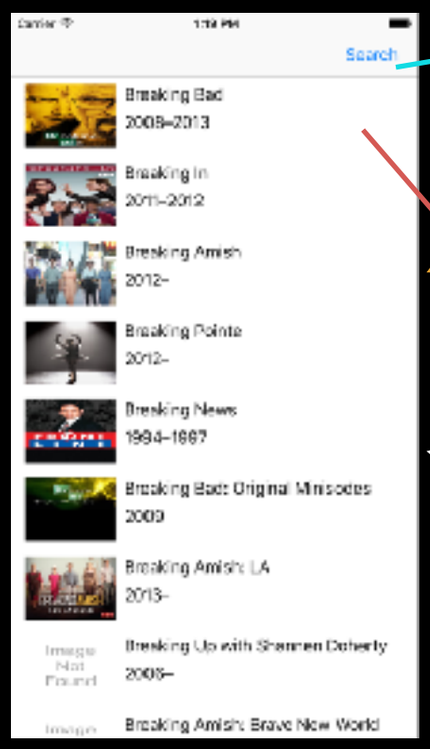


MovieBuff - App Logic

SearchViewController



MovieListViewController



"Search" tapped

"Done" tapped

"Back" tapped

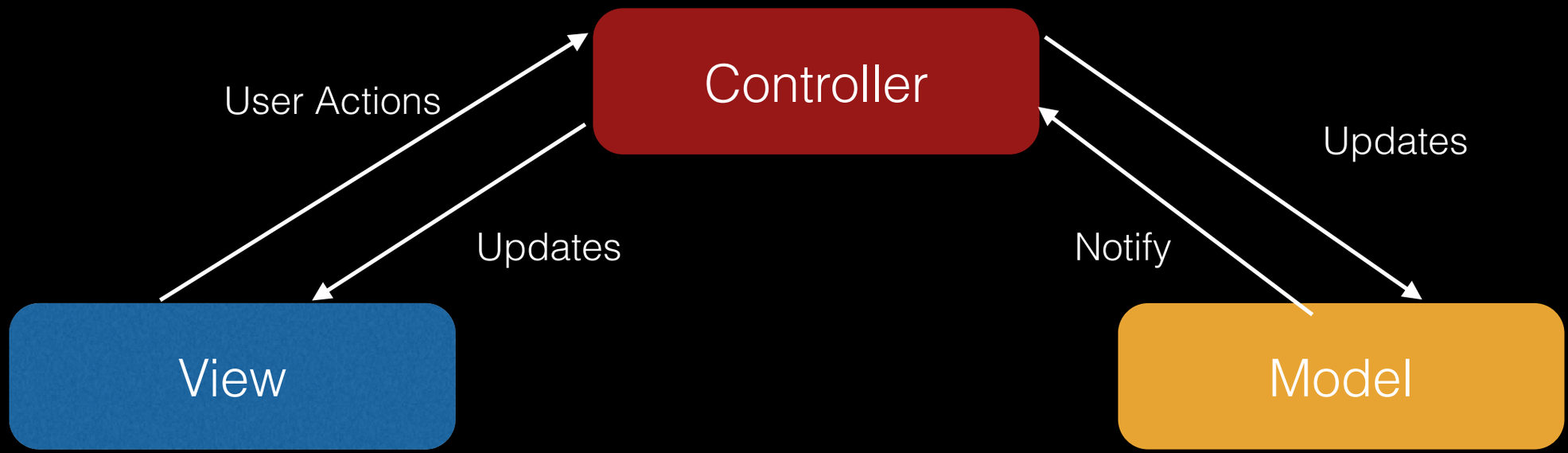
Long Press/ Tap Cell

MovieDetailViewController

Demo:

MVC

Model View Controller

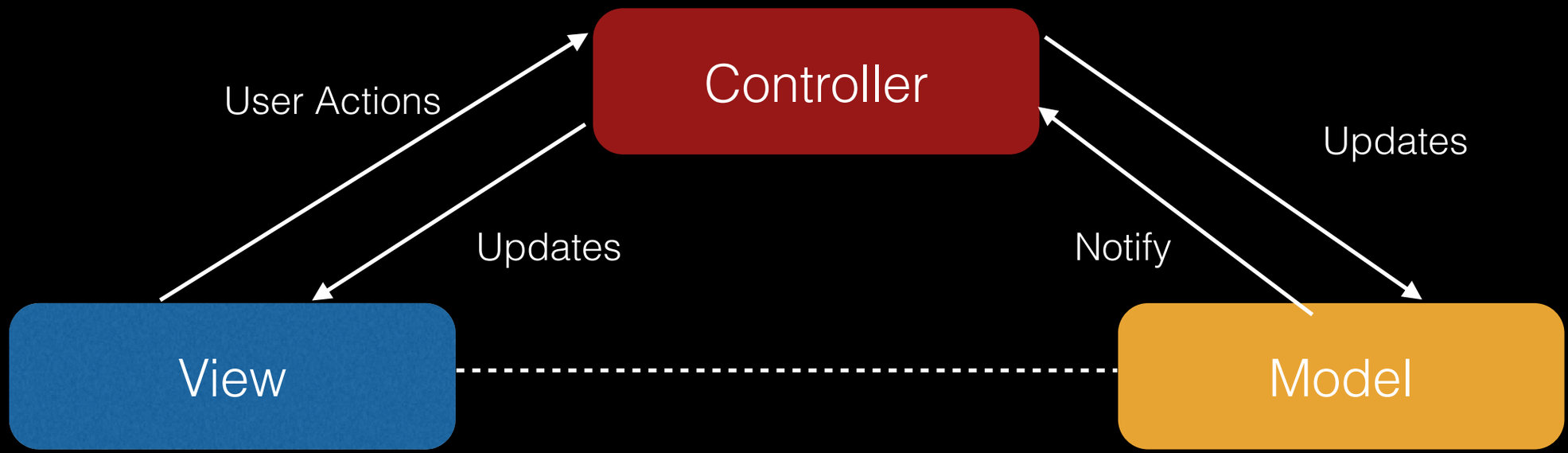


- UI/ Presentation Layer : View
- Data/ Business Logic Layer: Model
- Application Logic: Controller
- Theoretically, Model - View Direct Communication Allowed
  - iOS advocates all communication through controller
- iOS UIViewController = View or Controller ?
- View: Controller = Many:1
- Views not passive

Source: developer.apple.com

MVC

Model View Controller



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The Controller

- Delegate
- Data Source
- Navigation
- Target-Actions

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Easy To go wrong …

The Controller

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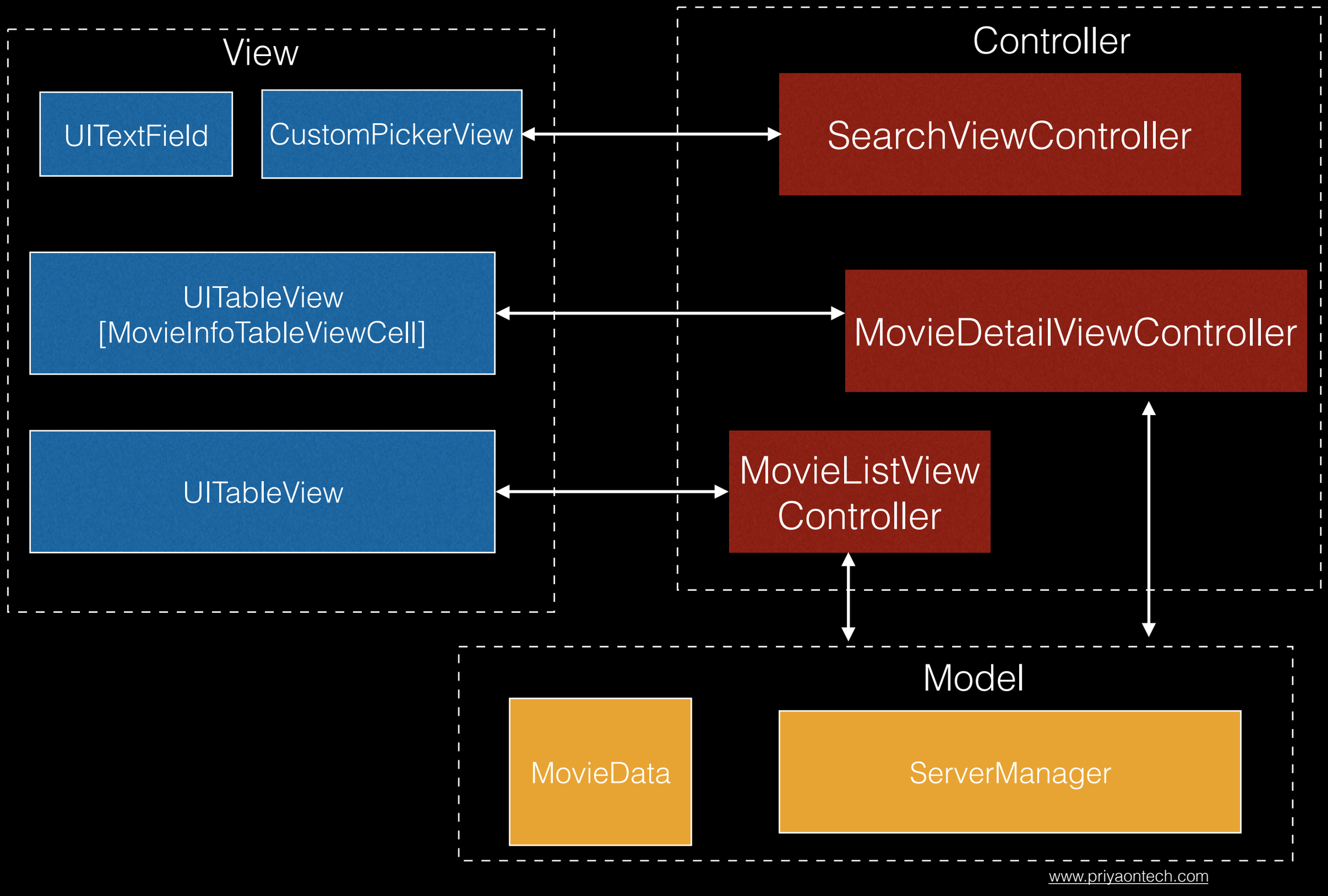
Easy To go wrong …

MVC in MovieBuff

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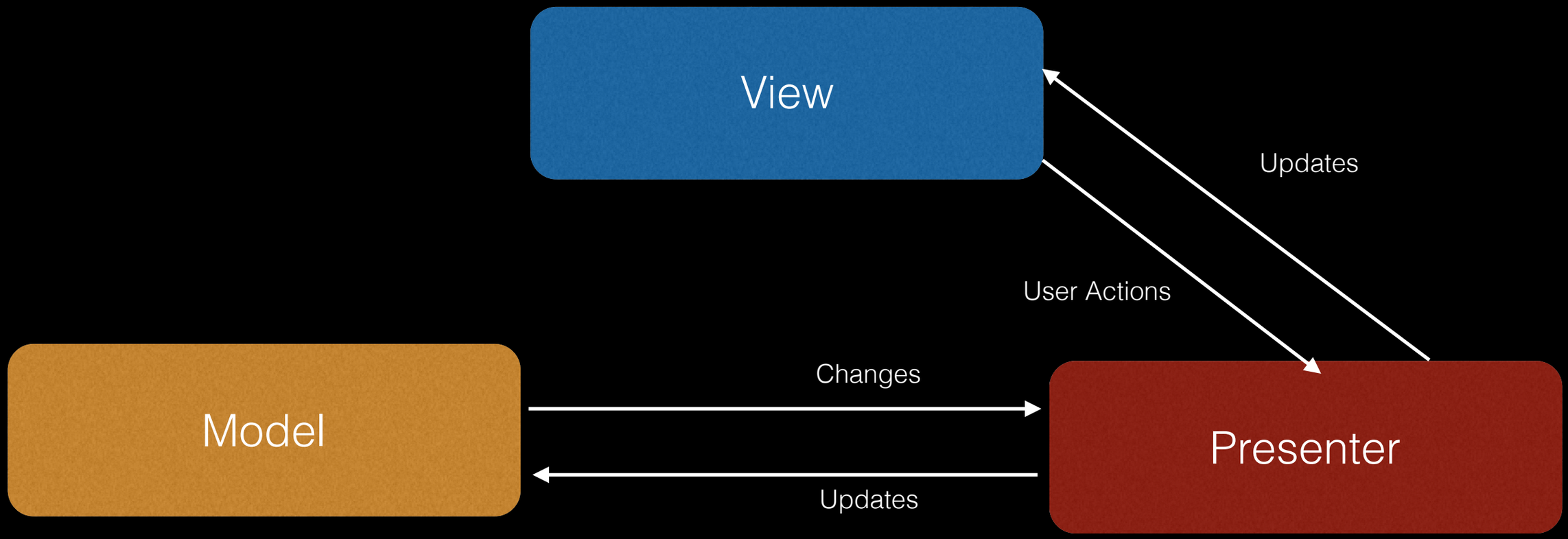
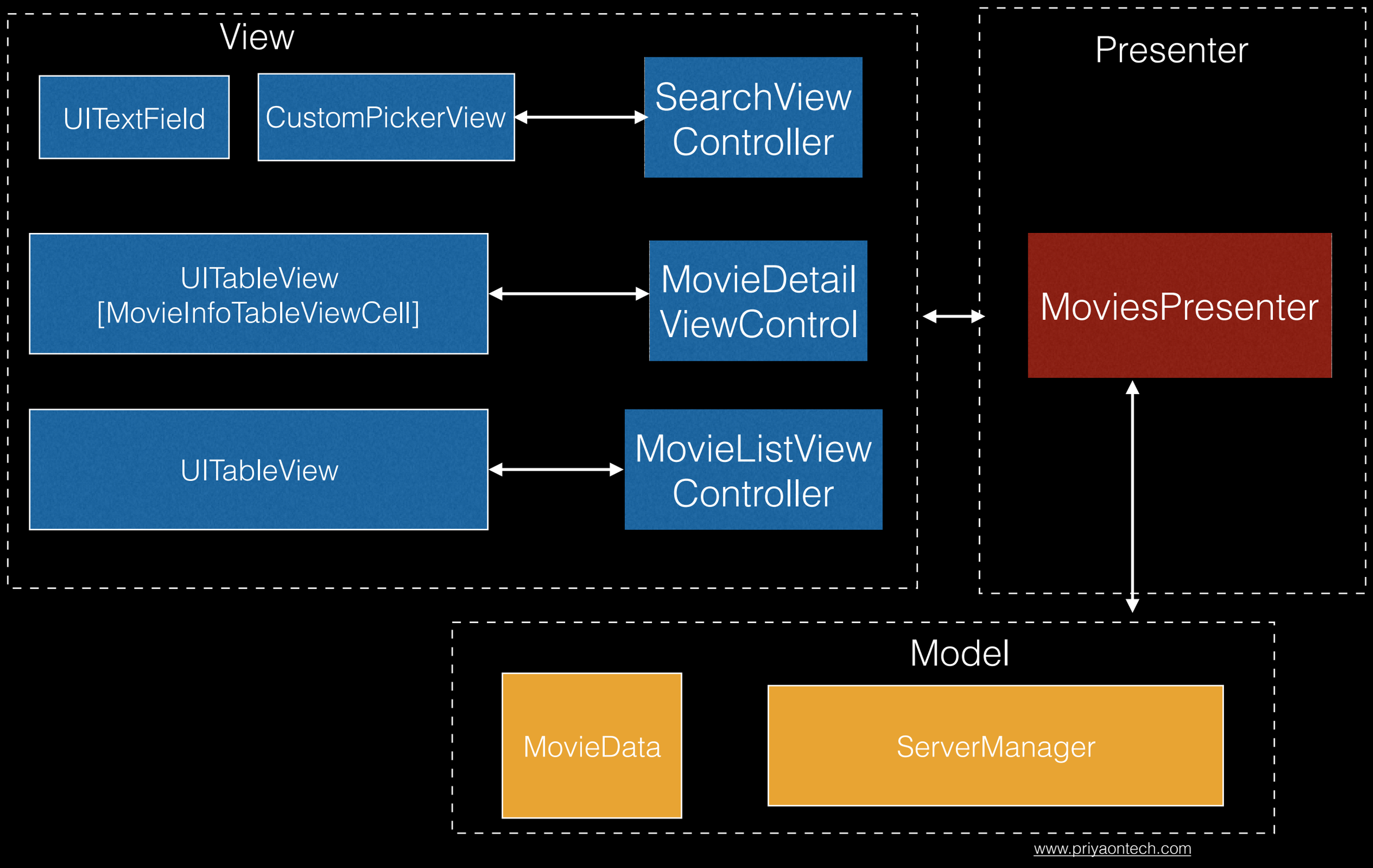
MVP

Model View Presenter

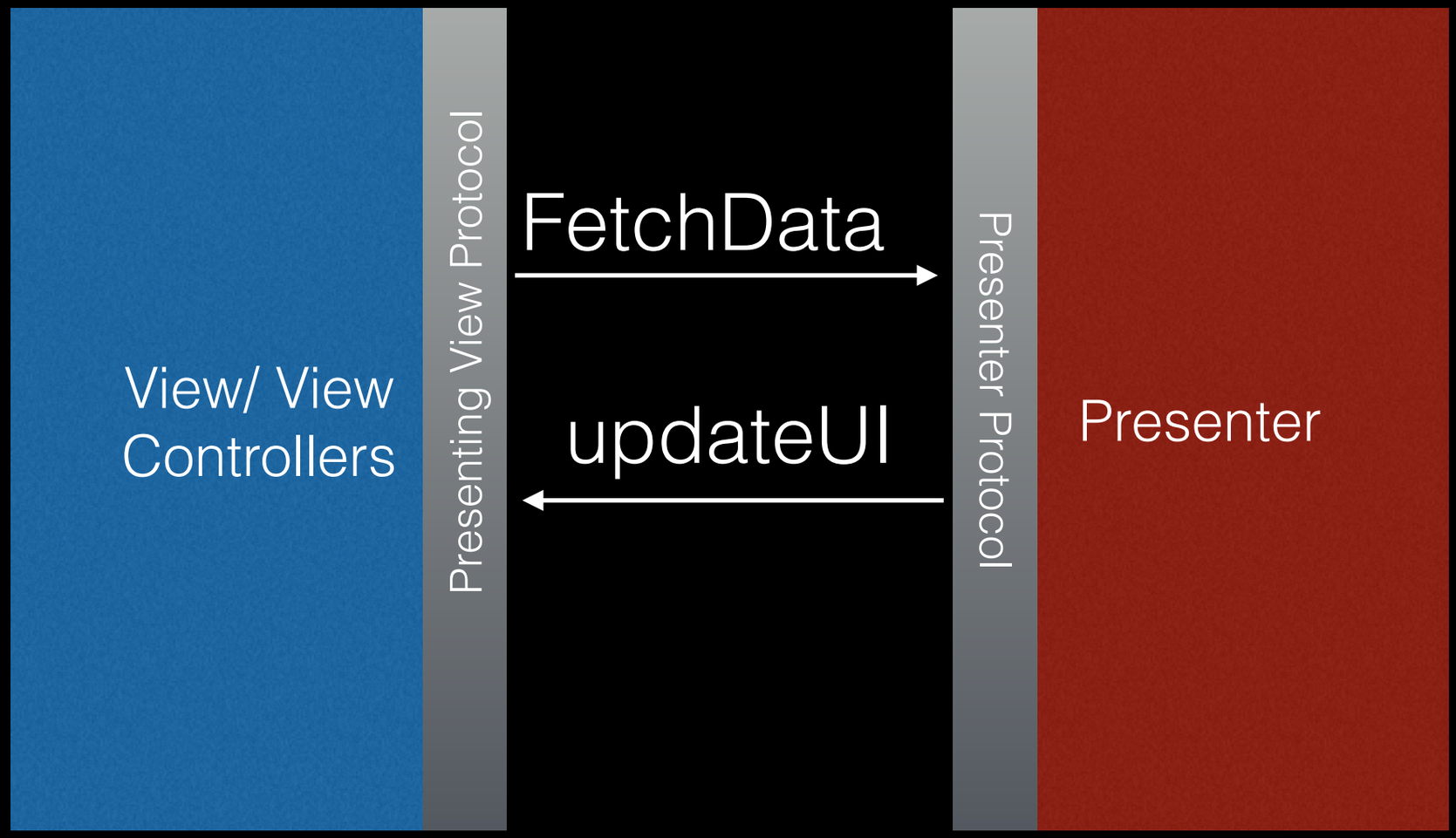


- A Variant of MVC
- UI/ Presentation Layer : View
- Data/ Business Logic Layer: Model
- Application Logic: Presenter
- Presenter *ideally* should handle all presentation logic
- View is passive
- View: Presenter typically 1:1
- Strict separation between View and Model

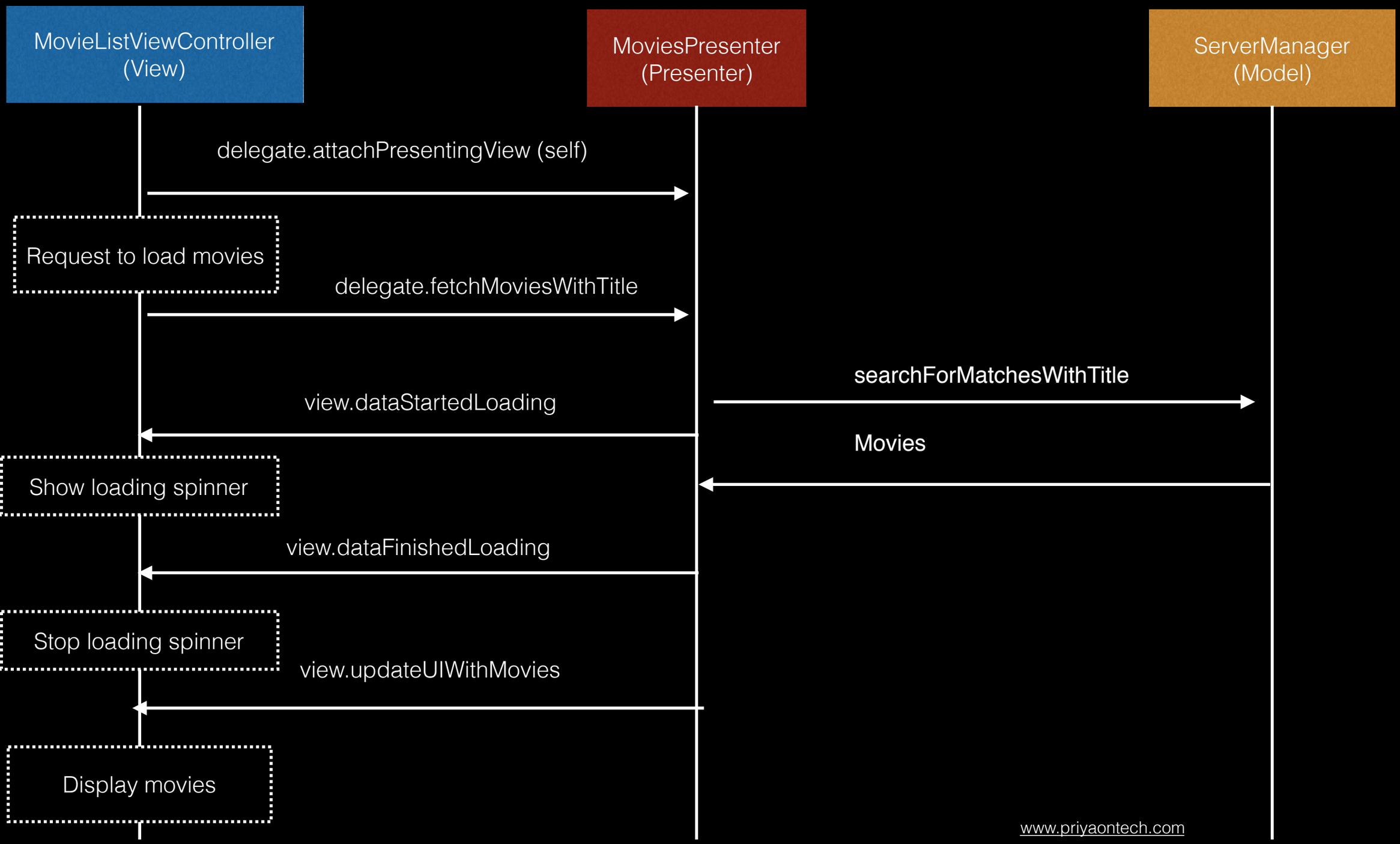
MVP in MovieBuff



View-Presenter w/ Delegation Pattern



MVP Flow


MovieListViewController
(View)
MoviesPresenter
(Presenter)
ServerManager
(Model)
delegate.attachPresentingView (self)
Request to load movies
delegate.fetchMoviesWithTitle
searchForMatchesWithTitle
view.dataStartedLoading
Movies
Show loading spinner
view.dataFinishedLoading
Stop loading spinner
view.updateUIWithMovies
Display movies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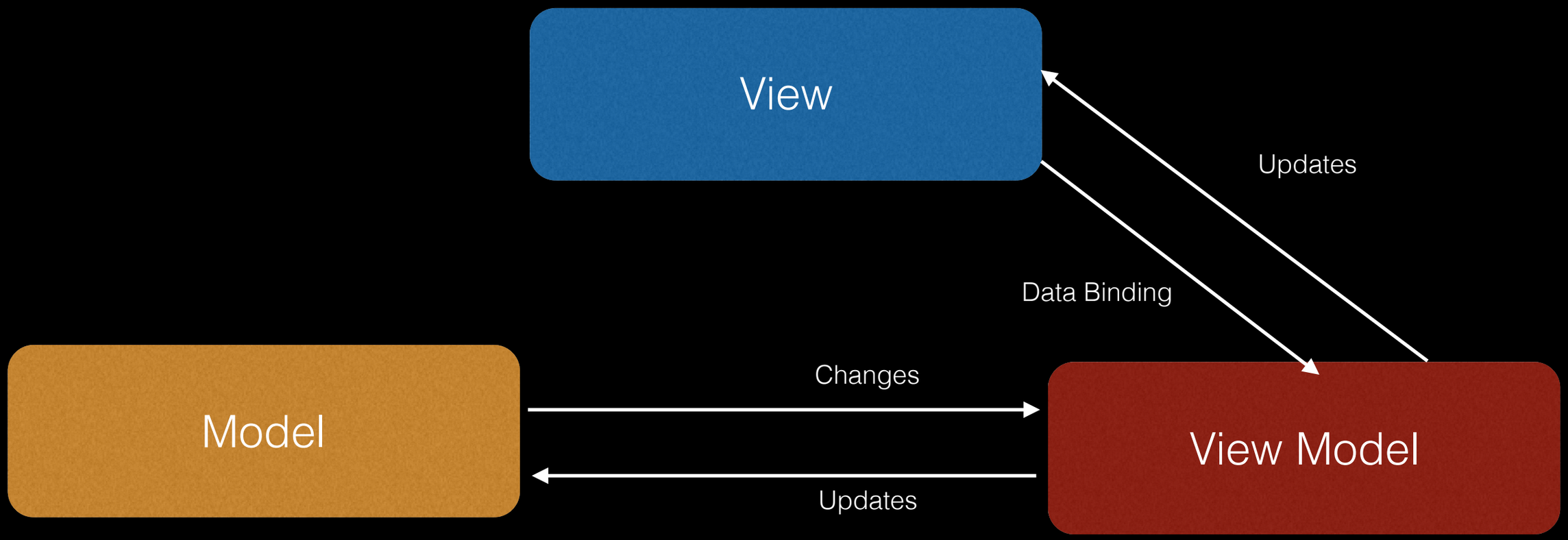
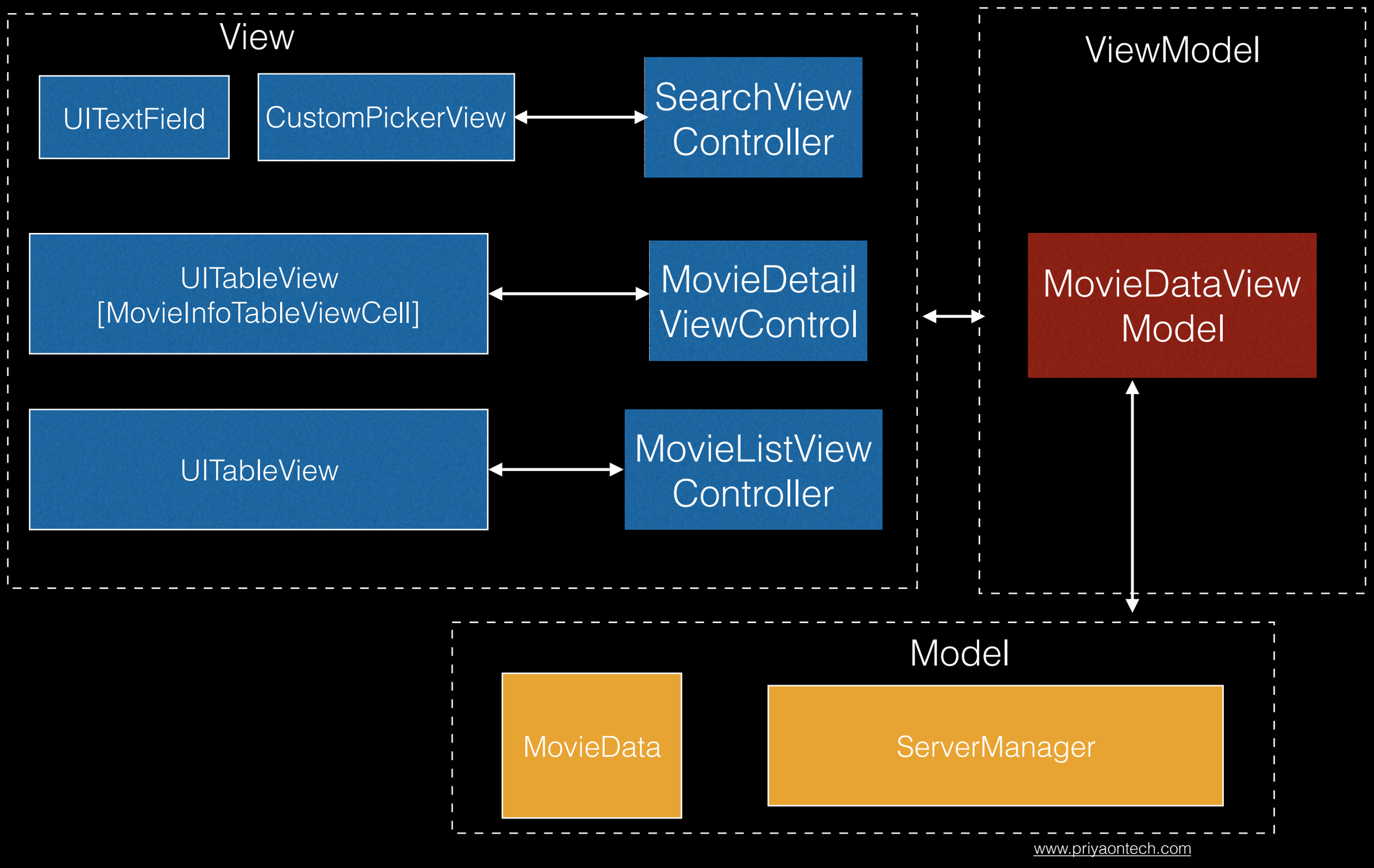
MVVM

Model View View Model



- A Variant of MVC
- UI/ Presentation Layer : View
- Data/ Business Logic Layer: Model
- Application Logic: Model View
- “Binding” between view and view-model
- View: Model View could be 1:Many

MVVM in MovieBuff



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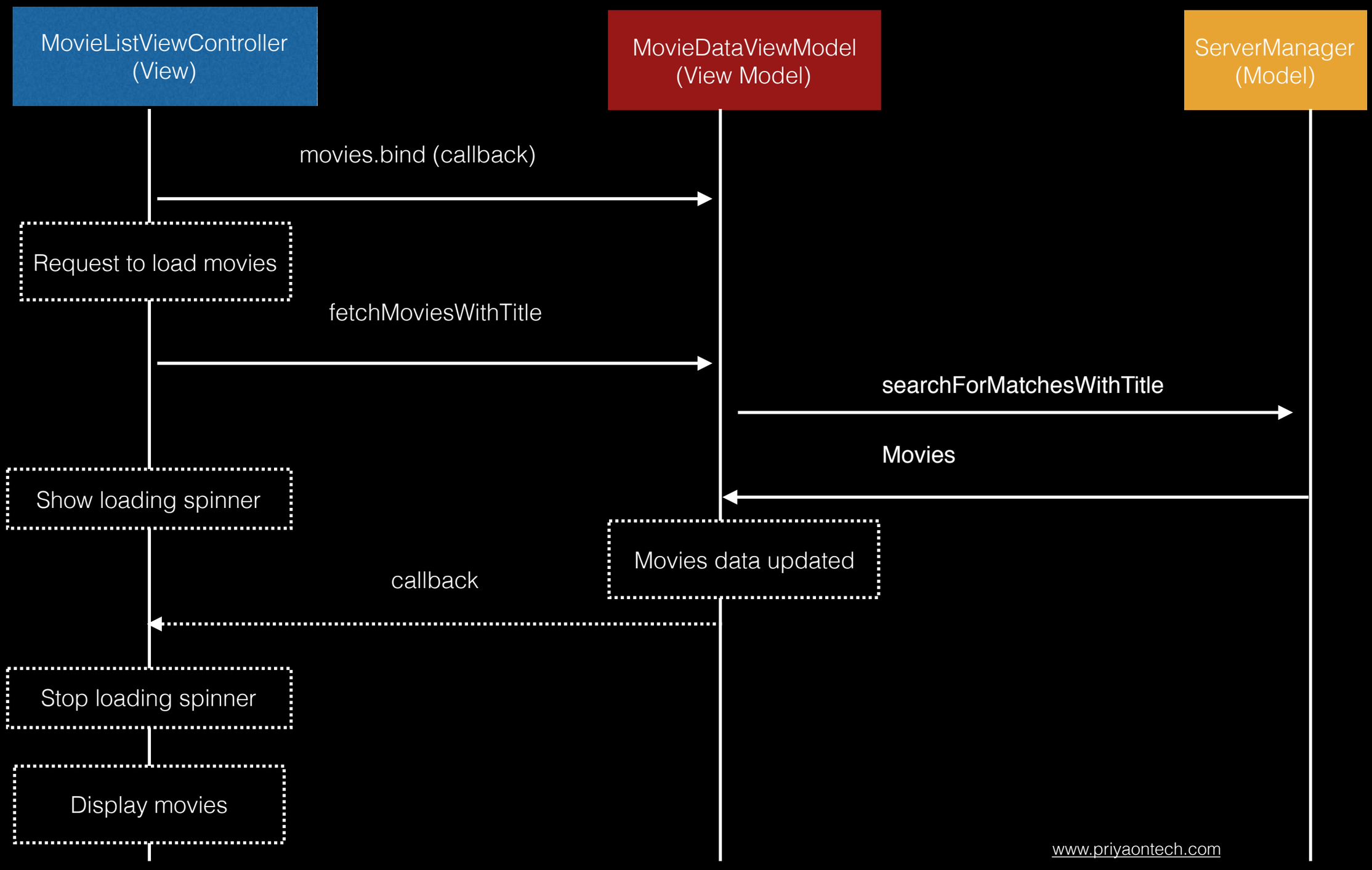
View-View Model Binding using Key-Value Observing (KVO)

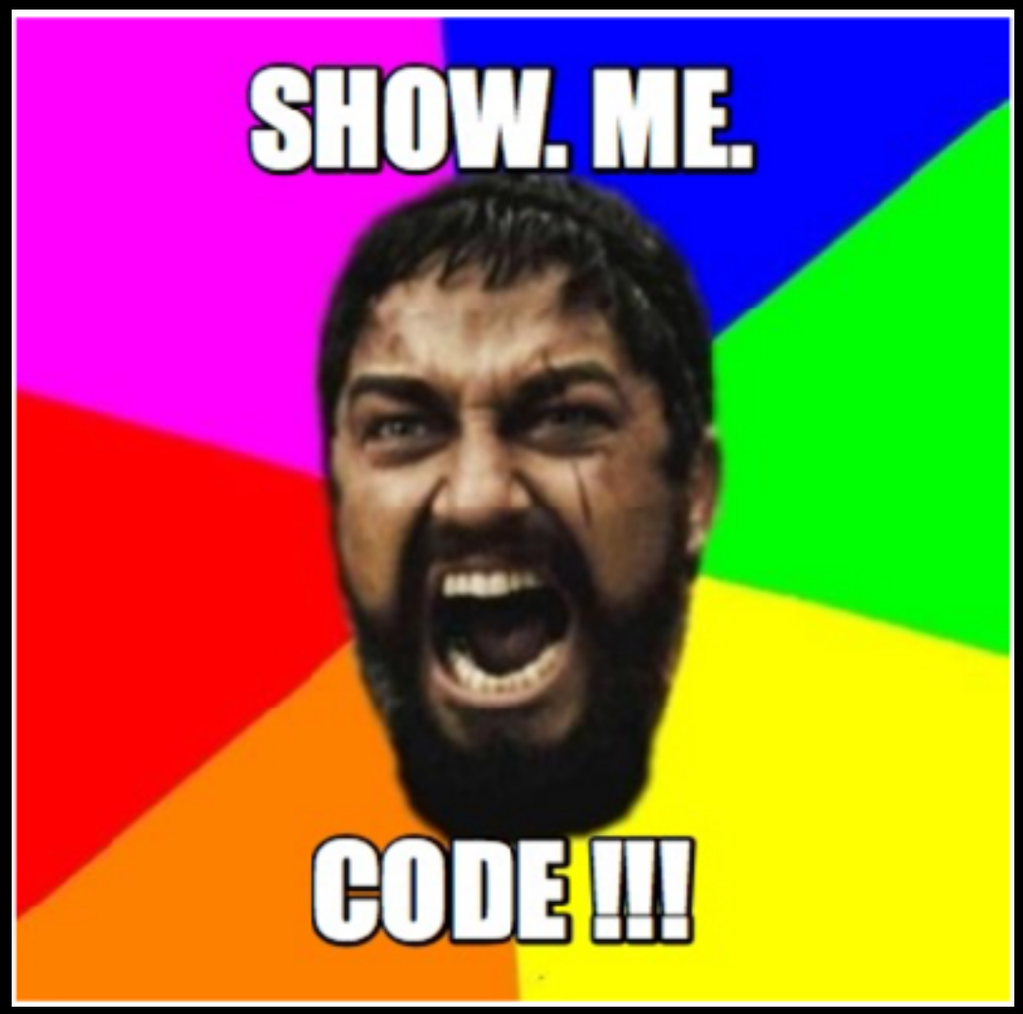
- KVO in Cocoa :
  - Object can be automatically notified of changes to state of another object
    - Observe properties on other object
- In ObjC - built into the runtime
- Swift - Not out of the box
  - One option dynamic modifier , NSObject only , ugly syntax
  - Another option …

Wrapper around Observable Properties

```
public struct DynamicType<T> {
    typealias ModelEventListener = (T)->Void
    typealias Listeners = [ModelEventListener]

    private var listeners:Listeners = []
    var value:T? {
        didSet {
            for (_,observer) in listeners.enumerated() {
                if let value = value {
                    observer(value)
                }
            }

        }
    }


    mutating func bind(_ listener:@escaping (T)->Void) {
        listeners.append(listener)
        if let value = value {
            listener(value)
        }
    }

}
```

MVVM Flow Example

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In Summary….

- MVC, MVP, MVVM have a common goal
  - Separation of concerns
  - Centerpiece is Controller/Presenter/ View Model
- MVP and MVVM are variants of MVC
- Don’t get bogged down by semantics
- On iOS
  - MVP using Delegation Pattern
  - MVVM using Key-Value Observer Pattern

Thank You !

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