BENJAMIN ENCZ

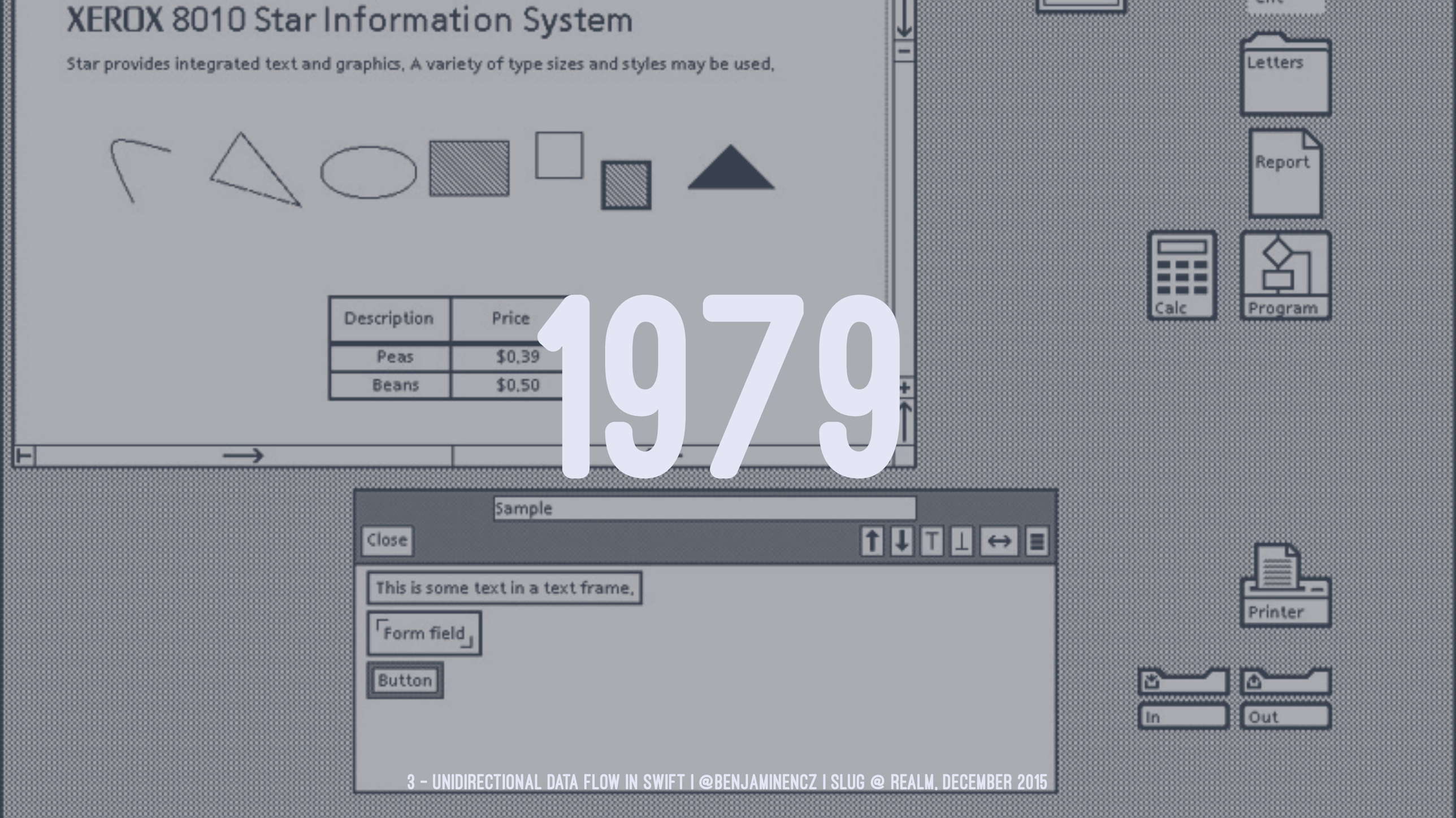
@BENJAMINENCZ

PlanGrid

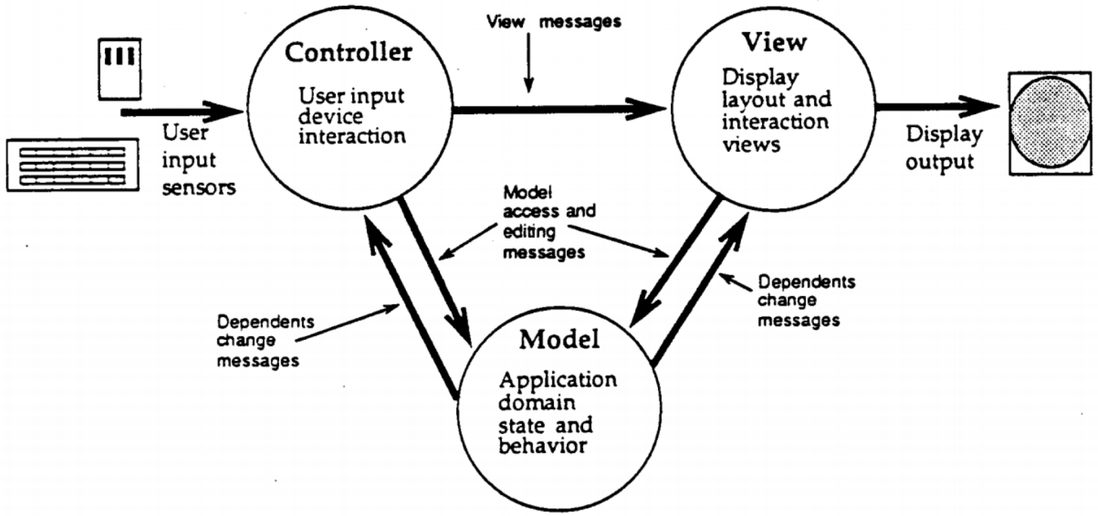
UNIDIRECTIONAL DATA FLOW IN SWIFT

&

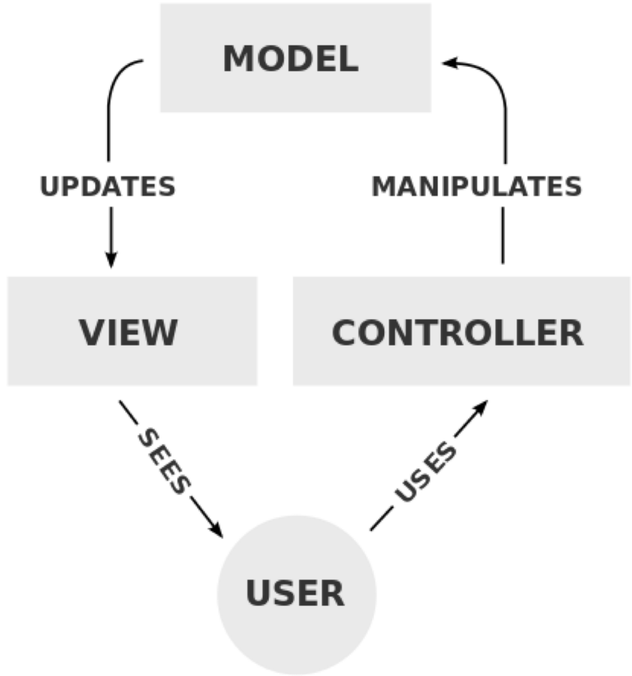
THE END OF MODEL-VIEW-CONTROLLER


XEROX 8010 Star Information System
Star provides integrated text and graphics, A variety of type sizes and styles may be used,
Description
Price
Peas
$0.39
Beans
$0.50
1979
Letters
Report
Calc
Program
Sample
Close
This is some text in a text frame.
Form field
Button
Printer
In
Out

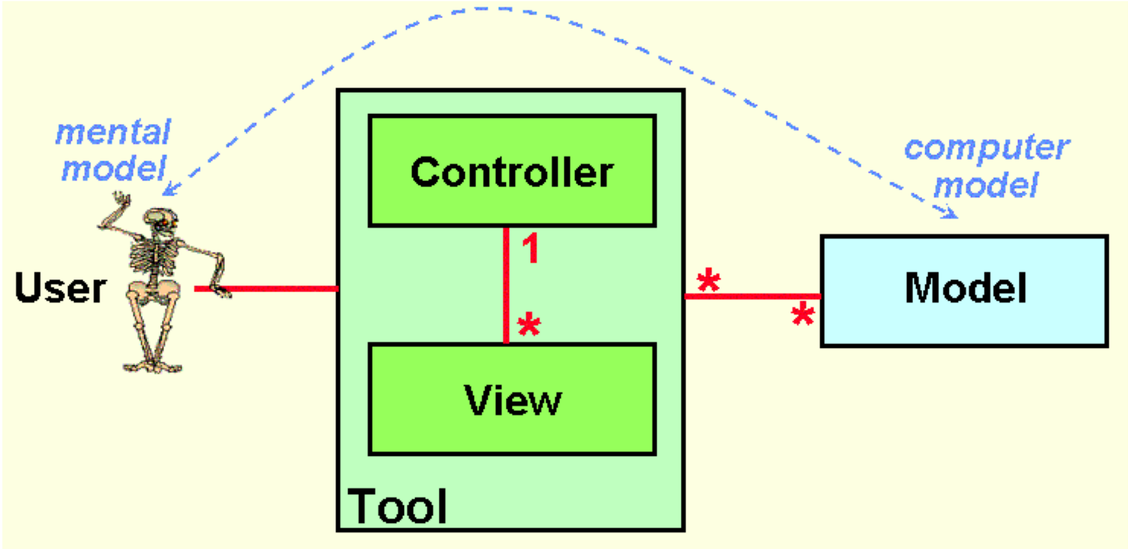
DOES ANYONE EVEN UNDERSTAND MVC?



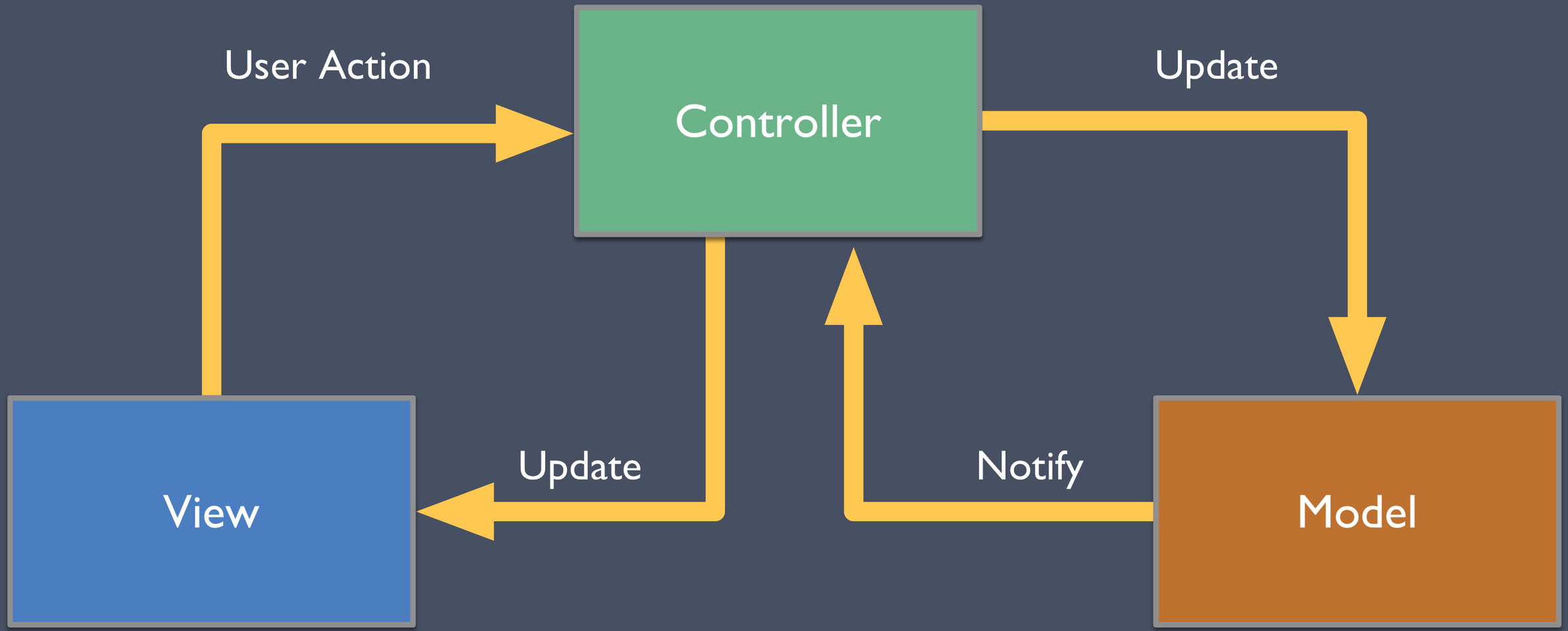
A Cookbook for Using View-Controller User the ModelInterface Paradigm in Smalltalk-80, September 1988



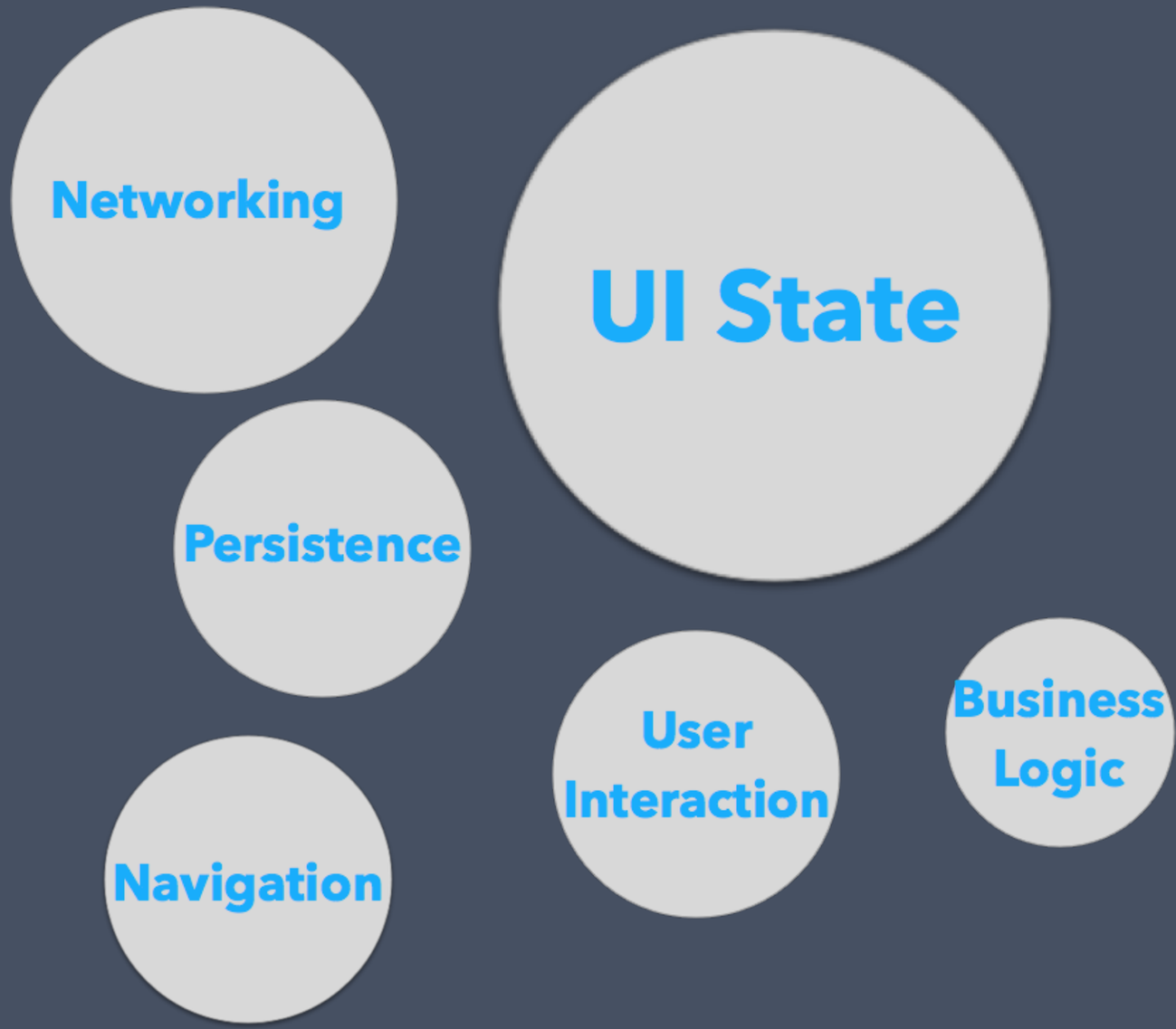
en.wikipedia.org/wiki/Model-view-controller#/media/File:MVC-Process.svg, 12/13/15



heim.ifi.uio.no/~trygver/themes/mvc/mvc-index.html, 12/13/15


User Action
Controller
Update
View
Update
Notify
Model

2016


Networking
UI State
Persistence
User Interaction
Business Logic
Navigation

MVC IS NOT A HOLISTIC APPLICATION ARCHITECTURE

PROBLEM #1:

VIEW CONTROLLERS ARE MICROMANAGERS

IMAGE CREDITS: NAKEDPASTOR.COM

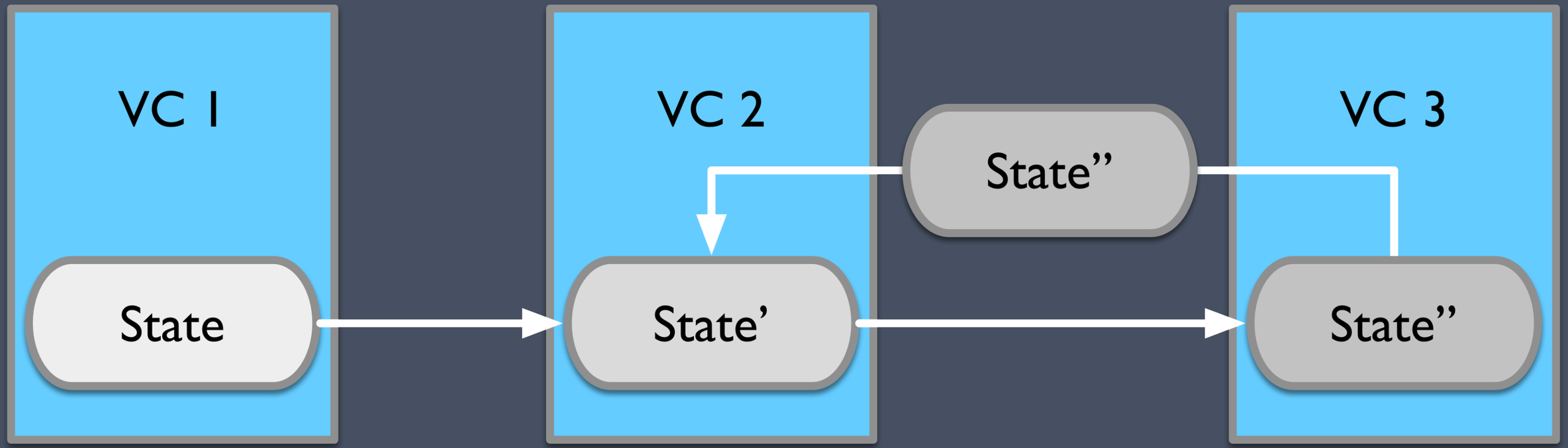
```
func userLoggedInWithUsername(username: String, password: String) {
    apiClient.authenticateUser(username, password: password) { response, error in
        if (error == nil) {
            let nextViewController = ...
            navigationController.pushViewController(nextViewController)
        } else {
            showErrorMessage(error)
        }
    }
}
```

PROBLEM #2: WHERE IS STATE?

WHERE IS STATE?

- CURRENTLY ACTIVE VIEWS
- CURRENTLY ACTIVE VIEW CONTROLLERS
- DATABASE
- SINGLETONS?

HOW DO I PASS INFORMATION BETWEEN VIEW CONTROLLERS?


VC 1
VC 2
VC 3
State
State'
State''
State''

PROBLEMS I HAVE WITH MVC

- VIEW CONTROLLERS NEED TO KNOW BUSINESS LOGIC DETAILS

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- VIEW CONTROLLERS NEED TO MANAGE SIGNIFICANT AMOUNT OF STATE (ALMOST ANYTHING THAT IS NOT STORED IN THE DB)

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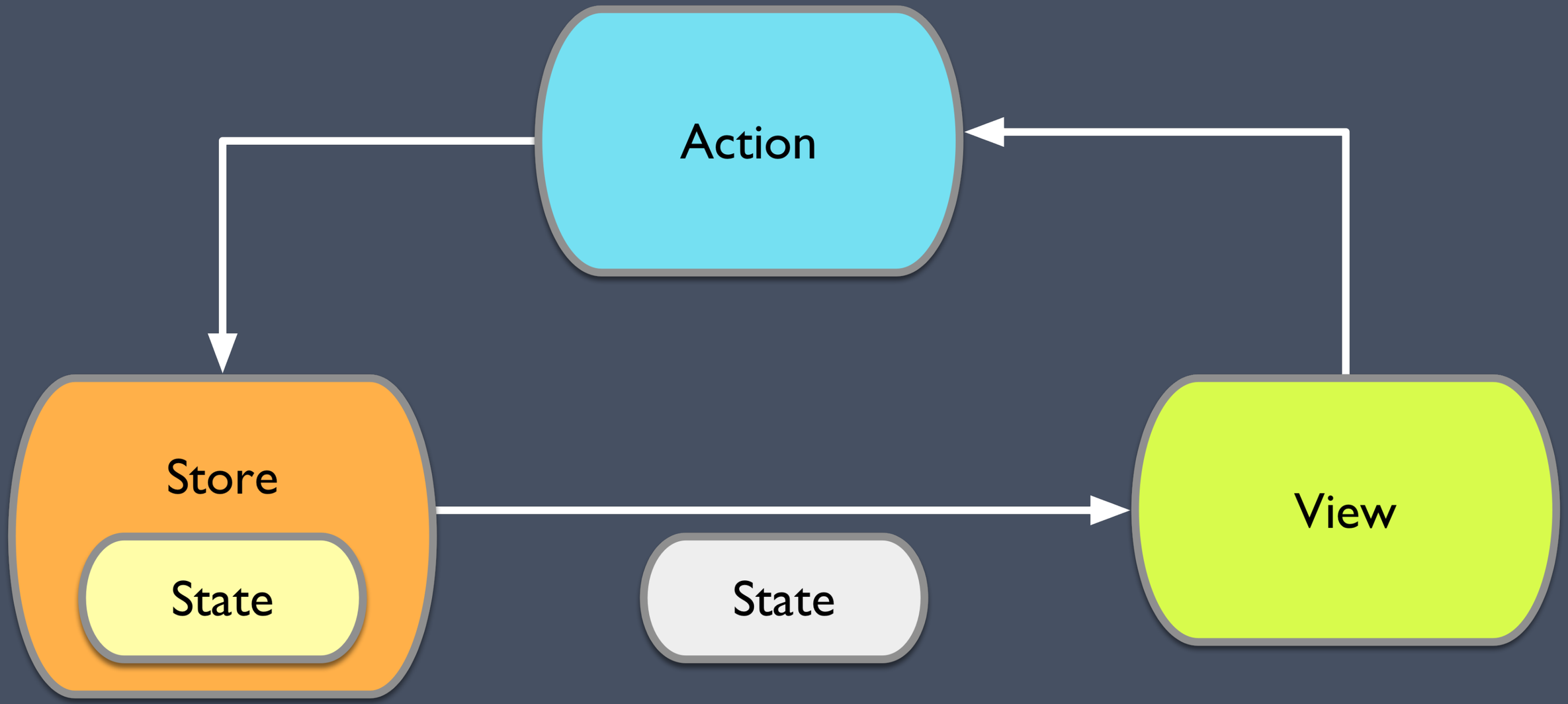
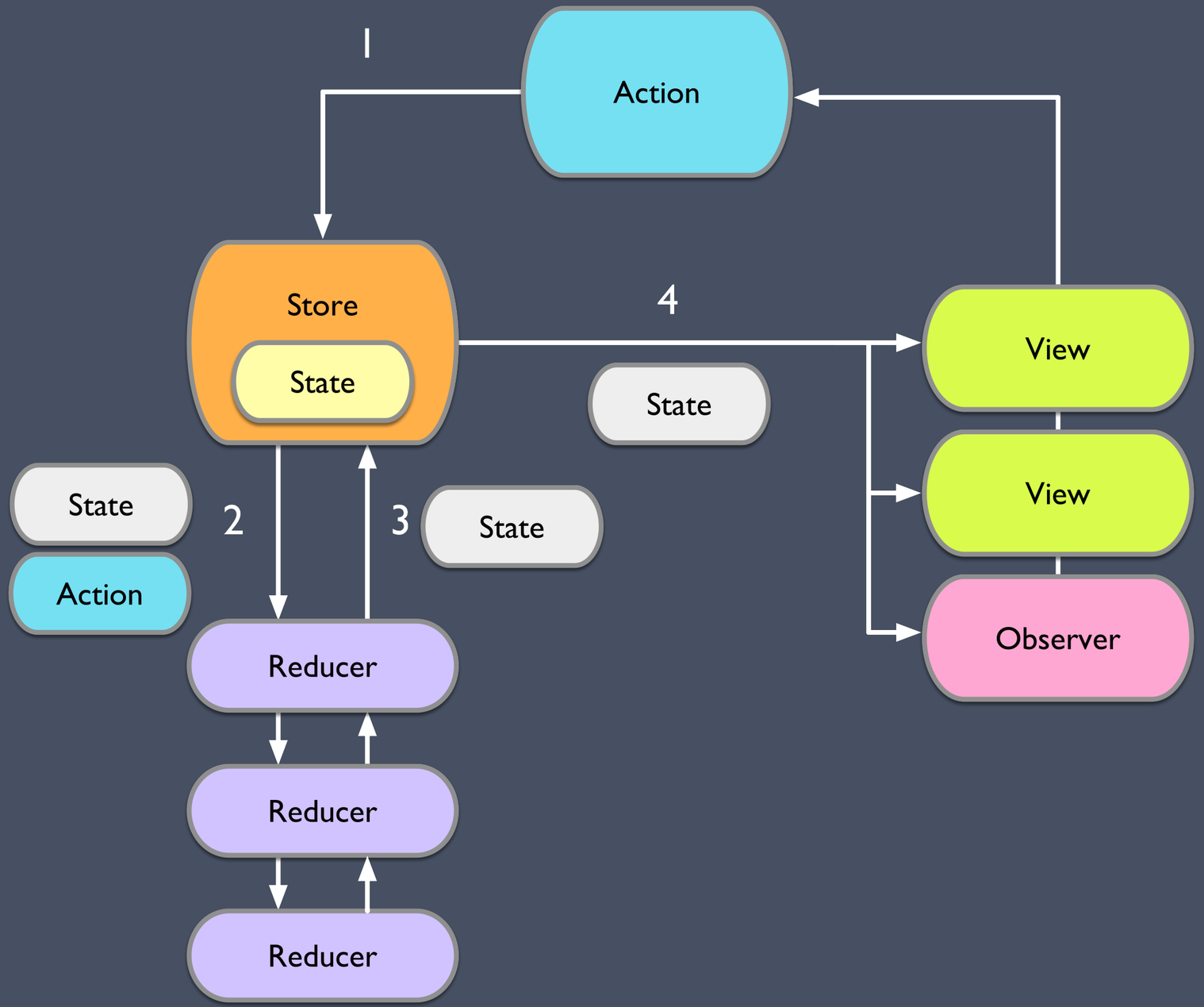
  - STATE MANAGEMENT & PROPAGATION HAPPENS AD-HOC
  - VERY DIFFICULT TO BUILD A MENTAL MODEL OF HOW AN APPLICATION WORKS

MEET REDUX!


Action
Store
State
State
View


1
Action
Store
State
4
State
View
View
Observer
State
2
3
State
State
Action
Reducer
Reducer
Reducer

REDUCERS:

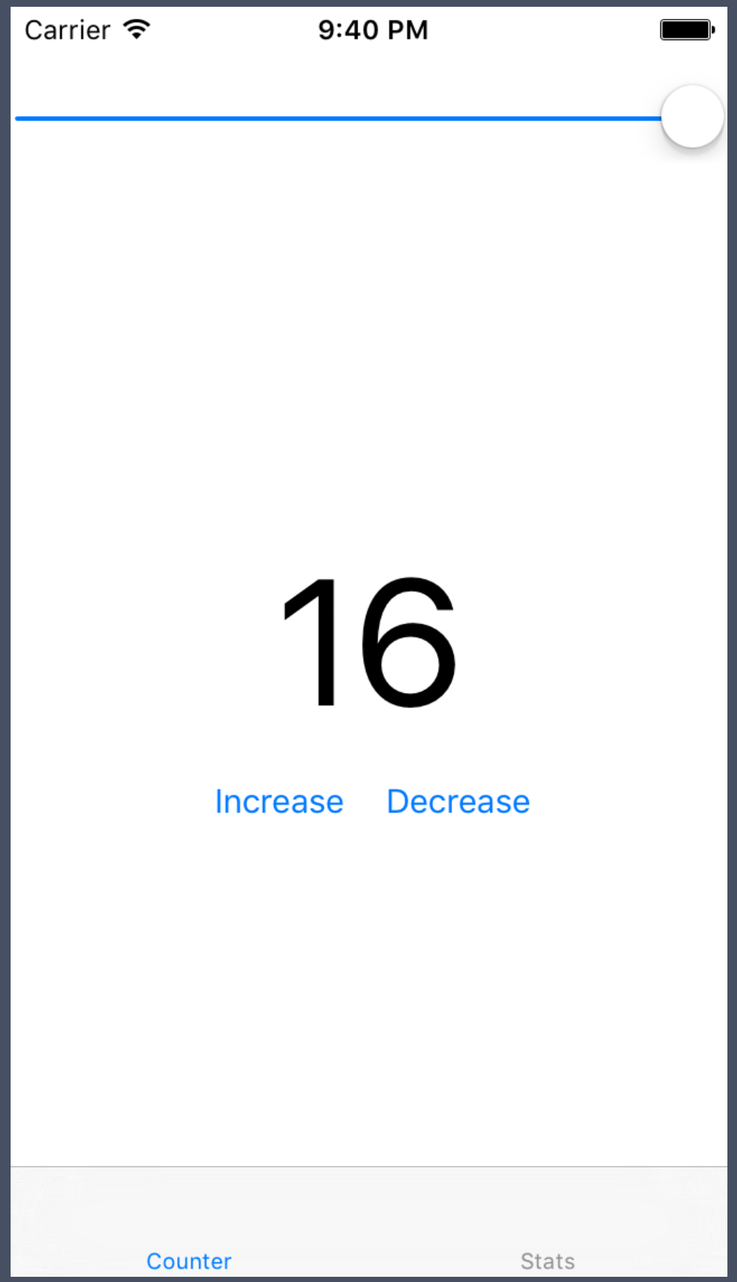
(STATE, ACTION) -> STATE

ACTIONS:

DECLARATIVE DESCRIPTION OF A STATE CHANGE

SWIFT FLOW

UNFINISHED OPEN SOURCE REDUX IMPLEMENTATION IN SWIFT

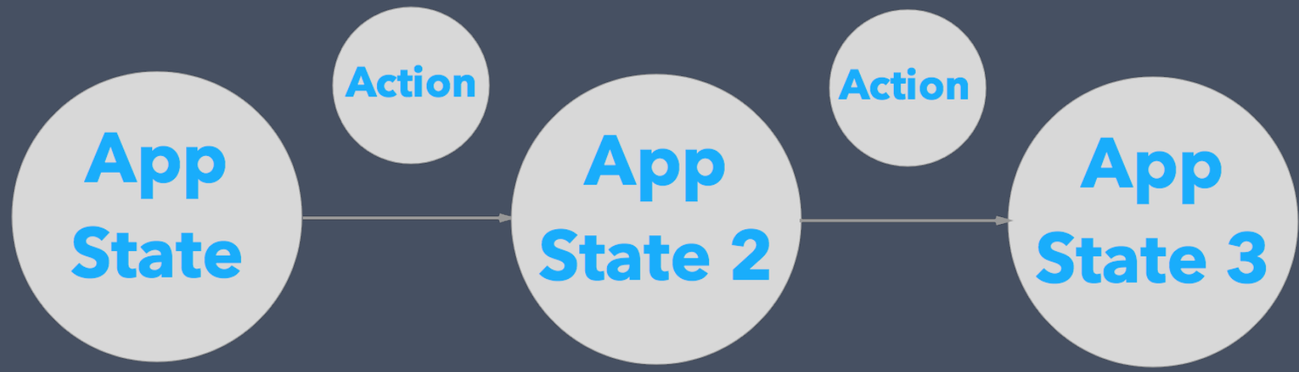

Carrier
9:40 PM
16
Increase
Decrease
Counter
Stats

```
struct AppState: StateType, HasNavigationState {
    var counter: Int = 0
    var navigationState = NavigationState()
}
```

```
func newState(state: AppState) {
    counterLabel.text = "\(state.counter)"
}

@IBAction func increaseButtonTapped(sender: UIButton) {
    mainStore.dispatch(
        Action(CounterActionIncrease)
    )
}

@IBAction func decreaseButtonTapped(sender: UIButton) {
    mainStore.dispatch(
        Action(CounterActionDecrease)
    )
}
```

```
struct CounterReducer: Reducer {

    func handleAction(state: AppState, action: Action) -> AppState {
        var state = state

        switch action.type {
        case CounterActionIncrease:
            state.counter += 1
        case CounterActionDecrease:
            state.counter -= 1
        default:
            break
        }

        return state
    }

}
```

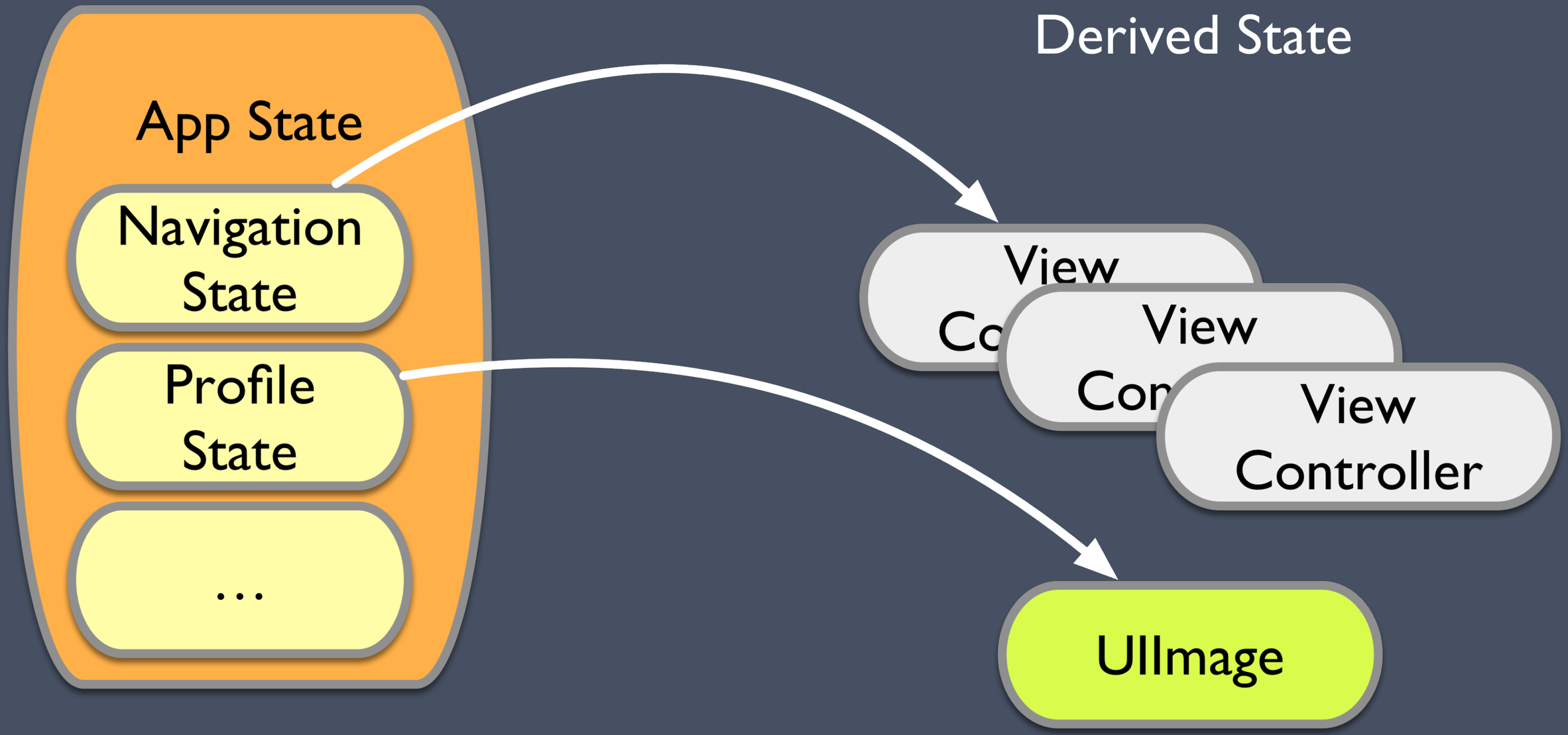
TIME TRAVEL!



DEMO

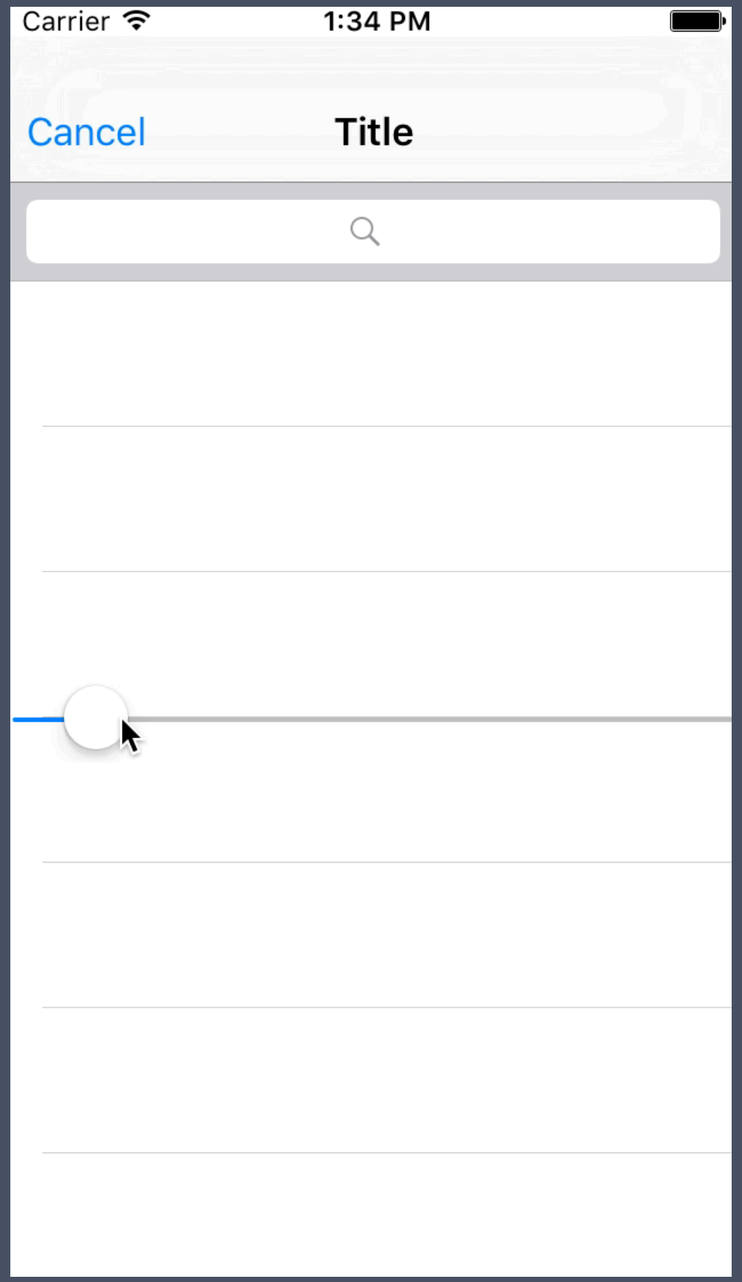
REAL WORLD EXAMPLES?

ENTIRE APP STATE IN ONE DATA STRUCTURE?


Derived State
App State
Navigation State
Profile State
…
View Controller
View Controller
View Controller
UIImage

WHAT ABOUT ASYNC?

```
func fetchUserList -> ActionCreator {
    return { state, store in
        self.apiClient.fetchUsers() { users in
            store.dispatch( SetUsers(users) )
        }
    }
}
```


Carrier
1:34 PM
Cancel
Title

CHALLENGES

- UIKIT
- ENCODING / DECODING
- RESTRICING ACCESS TO GLOBAL STATE

WHY SWIFT FLOW?

- SEPARATION OF CONCERNS

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- DECOUPLING OF INTENT AND IMPLEMENTATION

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- CLEAR, DECLARATIVE API

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- CLEAR, DECLARATIVE API
- PREDICTABLE, EXPLICIT STATE
- PROGRAM HAS A SHAPE

WHY SWIFT FLOW?

- SEPARATION OF CONCERNS
- DECOUPLING OF INTENT AND IMPLEMENTATION
- CLEAR, DECLARATIVE API
- PREDICTABLE, EXPLICIT STATE
- PROGRAM HAS A SHAPE
- AUTOMATIC STATE PROPAGATION

CREDITS

- GERALD MONACO (@DEVKNOLL) FOR INTRODUCING ME TO REDUX
- DAN ABRAMOV (@DAN_ABRAMOV) FOR BUILDING REDUX
- JAKE CRAIGE (@JAKECRAIGE) FOR FEEDBACK AND SUPPORT DURING IMPLEMENTATION

SPEAKERDECK.COM/BENJAMIN_ENCZ

GITHUB.COM/SWIFT-FLOW