Reagent

a ClojureScript interface to React

React Amsterdam Meetup
12 Feb. 2015

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- Clojure(Script) developer at 

- Clojure since 2009
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Full Clojure stack example @ Finalist

Commercial app.

Fairly complex UI

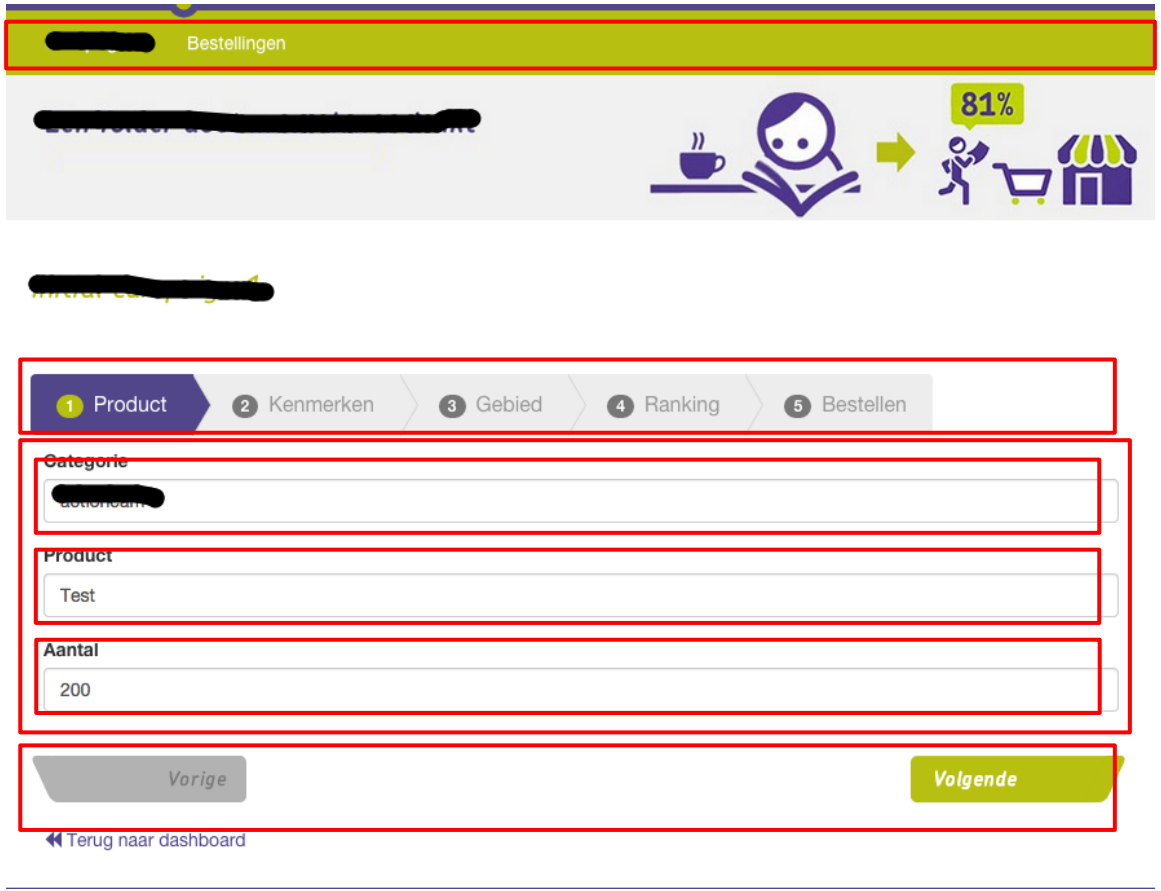
- Menu: 2 "pages"

Page 1:

Dashboard. Create new or select existing entity to work on.

Then:

- Wizard 1
  - Step 1..5
  - Each step has a component
- Wizard 1 - Step2
  - Wizard 2
    - Step 1'
    - Step 2'

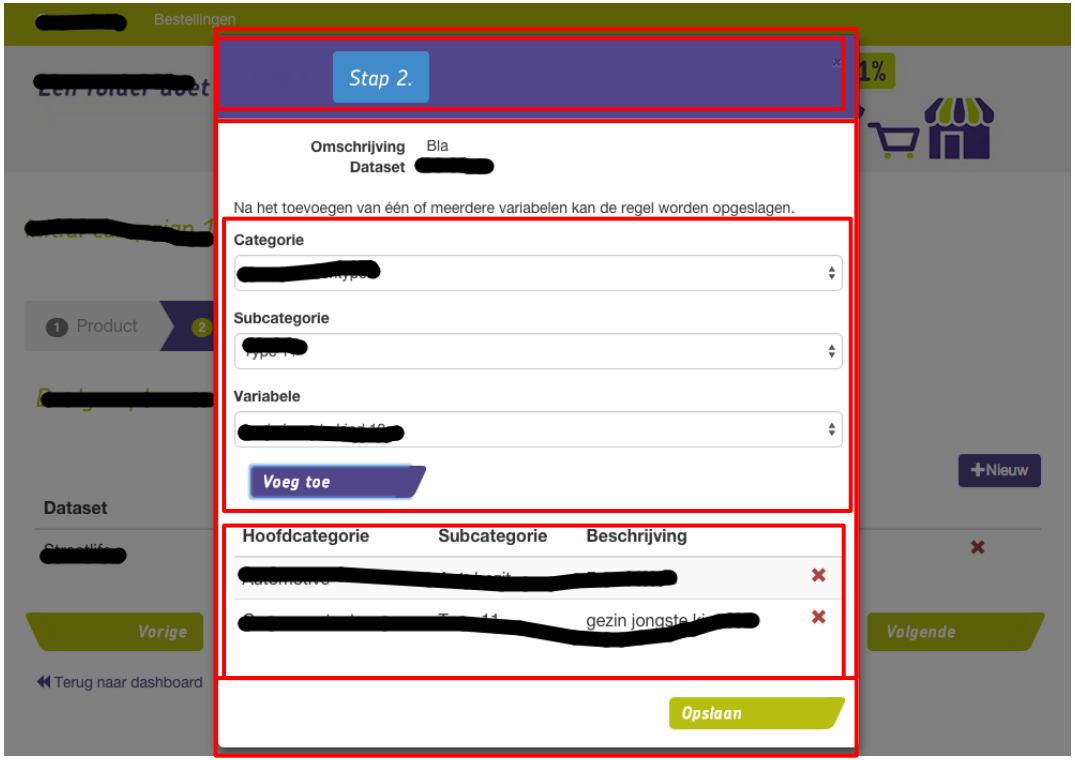


Full Clojure stack examples @ Finalist

Step 2 of inner wizard:

- Three dependent dropdowns + backing ajax calls
- Crud table of added items + option to remove
- When done: create something based on all of this on server and reload entire "model" based on what server says

Because of React + Om we didn't have to think about updating DOM performantly or keeping "model" up to date.



Agenda

- Intro
- A little Clojure syntax
- Hiccup
- ClojureScript atoms
- Reagent

Syntax

```
f(x) ->    (f x)
```

Syntax

```
if (...) {
   ...
} else {
   ...
}
```

->

```
(if ...
    ...
    ...)
```

Data literals

```
Symbol:       :a
Vector:       [1 2 3 4]
Hash map:     {:a 1, :b 2}
Set:          #{1 2 3 4}
List:         '(1 2 3 4)
```

Hiccup

```
[:a {:href "/logout"}
   "Logout"]
```

```
<a href="/logout">Logout</a>
```

```
[:div#app.container
  [:h2 "Welcome"]]
```

```
<div id="app" class="container">
  <h2>Welcome</h2>
</div>
```

ClojureScript atoms

```
(def my-atom (atom 0))
@my-atom ;; 0
(reset! my-atom 1)
(reset! my-atom (inc @my-atom)) ;; bad idiom
(swap! my-atom (fn [old-value]
                 (inc old-value)))
(swap! my-atom inc) ;; same
@my-atom ;; 4
```

Reagent

ClojureScript library around React

Uses `RAtoms` for state (global or local)

Components are 'just functions'™ that

- **must** return something renderable by React
- **can** deref `RAtom(s)`
- **can** accept props as args
- **may** return a closure, useful for setting up initial state

Reagent

- Components should be called like `[component args]` instead of `(component args)`
- Components are re-rendered when
  - props (args) change
  - referred `RAtoms` change
- Hook into React lifecycle via metadata on component functions

```
(def component
  (with-meta
    (fn [x]
      [:p "Hello " x ", it is " (:day @time-state)])
    {:component-will-mount #(println "called before mounting")
     :component-did-update #(.focus (reagent/dom-node %))} ))
```

RAtom

```
(def count-state (atom 10))

(defn counter []
  [:div
   @count-state
   [:button {:on-click #(swap! count-state inc)}
    "x"]])

(reagent/render-component [counter]
                          (js/document.getElementById "app"))
```

```
(defn local-counter [start-value]
  (let [count-state (atom start-value)]
    (fn []
      [:div
       @count-state
       [:button {:on-click #(swap! count-state inc)}
        "x"]])))

(reagent/render-component [local-counter 10]
                          (js/document.getElementById "app"))
```

local
RAtom

CRUD!

Name	Species		
Aardwolf	Proteles cristata	Edit	×
Atlantic salmon	Salmo salar	Edit	×
Curled octopus	Eledone cirrhosa	Edit	×
Dung beetle	Scarabaeus sacer	Edit	×
Gnu	Connochaetes gnou	Edit	×
Horny toad	Phrynosoma cornutum	Edit	×
Painted-snipe	Rostratulidae	Edit	×
Yellow-backed duiker	Cephalophus silvicultor	Edit	×
		Add	

RAtom with set containing animal hash-maps

```
(def animals-state (atom #{}))

(go (let [response
          (<! (http/get "/animals"))
          data (:body response)]
      (reset! animals-state (set data))))
```

```
(...
 {:id 2,
  :type :animal,
  :name "Yellow-backed duiker",
  :species "Cephalophus silvicultor"}
 {:id 1,
  :type :animal,
  :name "Painted-snipe",
  :species "Rostratulidae"}
```

Render all animals from state

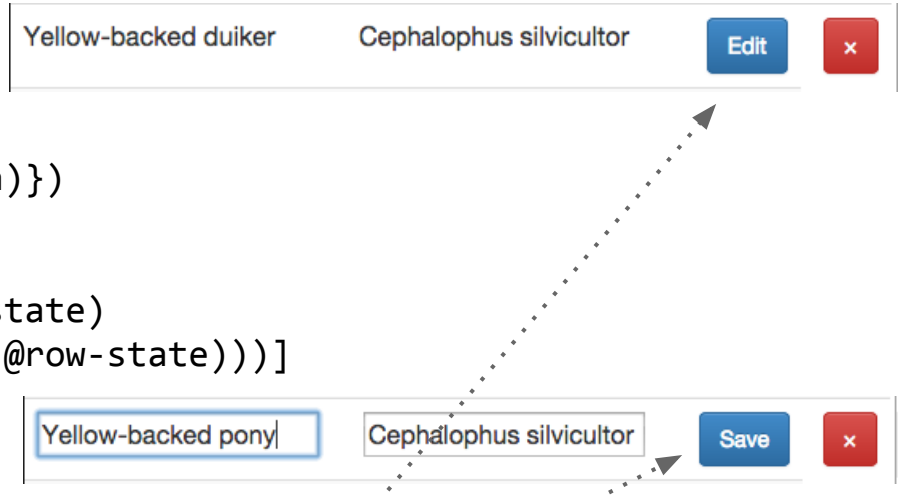
```
(defn animals []
  [:div
   [:table.table.table-striped
    [:thead
     [:tr
      [:th "Name"] [:th "Species"] [:th ""] [:th ""]]]
    [:tbody
     (map (fn [a]
            ^{:key (str "animal-row-" (:id a))}
            [animal-row a])
          (sort-by :name @animals-state))
     [animal-form]]]])
```

key needed for React to keep track of rows

a row component for each animal

form to create new animal

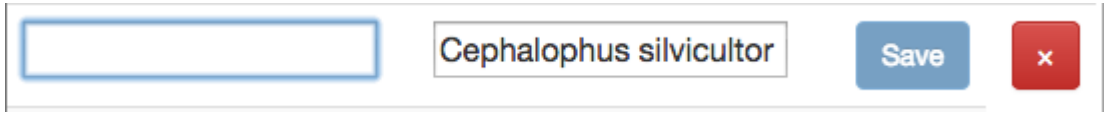
```
(defn animal-row [a]
  (let [row-state (atom {:editing? false
                         :name     (:name a)
                         :species  (:species a)})
        current-animal (fn []
                         (assoc a
                           :name (:name @row-state)
                           :species (:species @row-state)))]
    (fn []
      [:tr
       [:td [editable-input row-state :name]]
       [:td [editable-input row-state :species]]
       [:td [:button.btn.btn-primary.pull-right
             {:disabled (not (input-valid? row-state))
              :onClick (fn []
                         (when (:editing? @row-state)
                           (update-animal! (current-animal)))
                         (swap! row-state update-in [:editing?] not))}
             (if (:editing? @row-state) "Save" "Edit")]]
       [:td [:button.btn.pull-right.btn-danger
             {:onClick #(remove-animal! (current-animal))}
             "\u00D7"]]])))
```



```clojure
(defn field-input-handler
  "Returns a handler that updates value in atom map,
  under key, with value from onChange event"
  [atom key]
  (fn [e]
    (swap! atom
           assoc key
           (.. e -target -value))))

(defn input-valid? [atom]
  (and (seq (-> @atom :name))
       (seq (-> @atom :species))))

(defn editable-input [atom key]
  (if (:editing? @atom)
    [:input {:type     "text"
             :value    (get @atom key)
             :onChange (field-input-handler atom key)}]
    [:p (get @atom key)]))
```



```
(defn remove-animal! [a]
  (go (let [response
            (<! (http/delete (str "/animals/"
                                  (:id a))))]
        (if (= (:status response)
               200)
          (swap! animals-state remove-by-id (:id a))))))

(defn update-animal! [a]
  (go (let [response
            (<! (http/put (str "/animals/" (:id a))
                          {:edn-params a}))
            updated-animal (:body response)]
        (swap! animals-state
               (fn [old-state]
                 (conj
                   (remove-by-id old-state (:id a))
                   updated-animal))))))
```

if server says: "OK!", remove animal from CRUD table

replace updated animal retrieved from server

Code and slides at:

https://github.com/borkdude/react-amsterdam

Learn more at https://github.com/reagent-project