The Power & Beauty of Dojo

Building Great Interfaces Is Like Arguing A Case At Trial

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Designers & Developers Serve Different Masters

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- User Model:
  - “What *should* it do when I click on this button?”
- System Model:
  - “What should the system do when it is told to take a particular action?”
- You can’t serve the user model and system models at the same time

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Ajax: Dawn Of The Second System Model

- Should the server be tracking all of the UI state?
  - Or just the UI state changes that act on data?
  - What is the role of the server-side presentation layer when browsers can speak REST?
- If the client owns state, how should the server pickle and rehydrate the state?
- How should we help designers think about these choices?

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There Is No “Right Way”, Only Cheap vs. Expensive

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Some Things Were Always Cheap

- Markup is a fast way to prototype
- Adding an Ajax-y “delete” button
- Editing the values of items in input elements in-place
- Simple animations
- In-place updates to semi-static data

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Some Things Are (Less) Expensive

- Navigating huge data sets
  - Infrastructure for managing pagination and virtual scrolling
  - Widgets and visualizations built for performance
- Data-driven charting
- Offline and local data caching
- Script-based app layouts
- Querying the DOM for information

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Some Stuff Is Still Expensive

- On IE, nearly everything...
  - ... and nearly everyone is on IE
- Component models still absent
- Network latency
- Image manipulation, vector graphics, visual “flare”
  - Rounded corners, drop-shadows, 9-up backgrounds
- Rich-text editing
- Video/audio

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What Does All Of This Mean For Designers?

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More Options != Progress

- “Design Patterns” show up in Design too ;-)
- New tech means creating/learning new patterns
  - Constraints of the medium bounds what happens and when
  - E.g.: Ajax emerged when networks got fatter, browsers had spare cycles, and CSS had been fully explored
- Progressive enhancement matters even more in script-driven world

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New Tools For Each Level Of Concern

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New Tools For Each Level Of Concern

- “I just want to make this div turn yellow when I click and tell the server about it”
  - dojo.query(), dojo.behavior, dojo.anim(), dojo.connect(), dojo.xhr()

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New Tools For Each Level Of Concern

- “I just want to make this div turn yellow when I click and tell the server about it”
  - dojo.query(), dojo.behavior, dojo.anim(), dojo.connect(), dojo.xhr()
- “I want a slider control that I can style, and it needs to be accessible and I need to build some other things”
  - dijit.*, custom layers on top of dojo.query()

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New Tools For Each Level Of Concern

- “I just want to make this div turn yellow when I click and tell the server about it”
  - dojo.query(), dojo.behavior, dojo.anim(), dojo.connect(), dojo.xhr()
- “I want a slider control that I can style, and it needs to be accessible and I need to build some other things”
  - dijit.*, custom layers on top of dojo.query()
- “I want charts and graphs and grids and a full-blown desktop-style UI that mashes up lots of stuff”
  - dijit.layout, dojox.charting, dojox.grid, dojox.layout, dojo.data, dojo.rpc, dojox.data

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Every Layer Is Additive

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Example: Event Handler Style

```
// when the page loads, find all the deleteButton nodes and
// give ‘em an onclick handler
dojo.addOnLoad(function(e){

  dojo.query(“.deleteButton”).onclick(function(e){
    var n = e.target;

    dojo.style(n, “opacity”, 0.5);

    dojo.xhrPost({
      url: “doStuff.php”,
      content: { action: “delete”, item: n.id },
      load: dojo.hitch(dojo, “anim”, n, { height: 0 }),
      error: dojo.hitch(dojo, “style”, n, “opacity”, 1)
    });
  });

});
```

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Example: Component Style

```
dojo.declare(“my.InventoryItem”,
  [ dijit._Widget, dijit._Templated ],
  {
    id: “”,
    onDelete: function(){
      // ...
    },
    // ... other action handlers here...
    templateString: “<div dojoAttachEvent=’onclick: onDelete’
    dojoAttachPoint=’deleteButton’>delete</div> ...”
  }
);

var ii = new my.InventoryItem({
  id: “thinger”,
  // ...
});
```

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“<” > “createElement(”

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New Patterns For Markup

```
<div dojoType="dijit.layout.BorderContainer">
  <div dojoType="dijit.layout.ContentPane"
    href="leftContent.html"
    splitter="true"
    minSize="150"
    region="left">
  </div>
  <div dojoType="dijit.layout.ContentPane" region="center">
    ...
  </div>
  <div dojoType="dijit.layout.ContentPane"
    href="bottomContent.html"
    splitter="true"
    minSize="150"
    region="bottom">
  </div>
</div>
```

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Power Is...

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Control, But Only When You Need It

```
<!-- customizing behavior isn't magic,
and doesn't require subclassing -->
<div dojoType="dijit.layout.BorderContainer"
  ... >
  <script type="dojo/connect" event="layout">
    // whenever the layout event is called, code here is executed
  </script>
</div>
```

```
// ...but subclassing is easy
dojo.require("dijit.layout.BorderContainer");
dojo.declare("MyAwesomeContainer",
             dijit.layout.BorderContainer,
  {
    layout: function(){
      this.inherits();
      ...
    }
  }
);
```

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Control, But Only When You Need It

```
// handling markup-driven creation can be in your control

dojo.declare("MyAwesomeClass", null, {
  constructor: function(thinger, blah, blah){ ... },
  markupFactory: function(obj, node){
    return new MyAwesomeClass(obj.thinger, obj.blah, obj.blah);
  }
});
```

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A Consistent Appraoch

```
// things which expect a single result in the
// future always return instances of dojo.Deferred

dojo.xhrGet({ url: “thinger.txt” }).addCallback(
  function(data){ ... }
);


var store = new dojox.data.FlickrStore({ ... });
store.fetch({ tags: “dojo” }).addCallback(
  function(items){ ... }
);
```

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A Consistent Approach

```
// Everything is an event if you want it to be

dojo.connect(dojo, “xhr”, function(args){
  console.debug(“fetching: “, args.url);
});

var n = dojo.byId(“someNode”);
dojo.connect(n, “onclick”, function(e){ // e is always passed
  console.debug(“clicked on:”, e.target);
});

var w = dijit.byId(“toggleButton”);
dojo.connect(w, “onClick”, function(){ ... });

// shortcuts also help us keep it readable
w.connect(“onClick”, function(){ ... });
```

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A Consistent Approach

```
// Markup == Code
var w = new dijit.widget.Button({
  id: “myButton”,
  label: “howdy!”,
  onClick: function(){ ... }
}, “myButton”);
```

```
<!-- Markup == Code -->
<div dojoType=”dijit.widget.Button”
  id=”myButton”
  jsId=”w”
  label=”howdy!”>
  <script type=”dojo/method” event=”onClick”>
    ...
  </script>
</div>
```

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A Consistent Appraoch

```
// things that take data expect the same data store interface

var grid = new dojox.grid.DataGrid({
  store: storeRef,
  query: { name: “*” },
  ...
});

var autoCompleter = new dijit.form.FilteringSelect({
  store: storeRef,
  query: { type: “country” },
  ...
});
```

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Beauty Is...

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A Plan For Right Now, And For The Future

```
<!-- upgrade some markup to be “stampable” -->
<div dojoType="dijit.Declaration"
  widgetClass="foo.Bar"
  defaults="{ label: ‘blah’ }" >
    ...some markup...
  <button dojoType="dijit.form.Button">
    ${label}
  </button> ... more markup
</div>

<!-- create and configure instances on the same page -->
<div dojoType="foo.Bar" label="foo"></div>
<div dojoType="foo.Bar" label="bar"></div>
```

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A Plan For Right Now, And For The Future

```
// moving our widget to a class
dojo.provide(“foo.Bar”);
dojo.require(“dijit.dijit”);
dojo.require(“dijit.form.Button”);
dojo.delcare("foo.Bar", [ dijit._Widget, dijit._Templated ],
  {
    templatePath: dojo.moduleUrl(“foo”, “templates/Bar.html”),
    widgetsInTemplate: true,
    label: ‘blah’
  }
);
```

```
<div>
  ...some markup...
  <button dojoType="dijit.form.Button">
    ${label}
  </button> ... more markup
</div>
```

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A Plan For Right Now, And For The Future

```
// moving our widget to a class
dojo.provide(“foo.Bar”);
dojo.require(“dijit.dijit”);

dojo.require(“dojox.dtl._Templated”);

dojo.require(“dijit.form.Button”);
dojo.delcare("foo.Bar",
  [ dijit._Widget, dojox.dtl._Templated ],
  {
    templatePath: dojo.moduleUrl(“foo”, “templates/Bar.html”),
    widgetsInTemplate: true,
    showButton: false,
    label: ‘blah’
  }
);
```

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A Plan For Right Now, And For The Future

```
<div>
  ...some markup...
  {% if showButton %}
  <button dojoType="dijit.form.Button">
    {{label}}
  </button>
  {% endif %}
  ... more markup
</div>
```

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Control, But Only When You Need It

```
<head>
  <style type="text/css">

    @import "dojoroot/dijit/themes/tundra/tundra.css"

    .tundra .dijitMenu {
      border: 2px solid #7eabcd;
      ...
    }

  </style>
</head>
<body class="tundra">
  <!-- ... -->
</body>
```

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Some Quick Demos

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Questions?

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Thank You!

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