

Rich Web Apps With



ExtJS 4

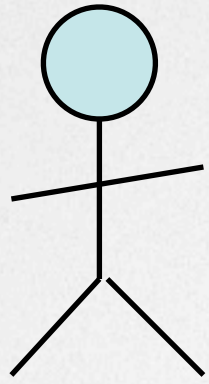


@bryntum

www.bryntum.com

Agenda

- Who am I?
- What is Ext JS?
- Ext Class system
- Dealing with data
- Widgets, Component Model
- Building a simple component



Mats Bryntse

- ❖ 36+ yrs old, from Helsingborg Sweden
- ❖ Background:
 - Previously a SW consultant: C#, ASP.NET, C
 - Found Ext JS in 2007, never looked back
 - Started Bryntum 2009
- ❖ Bryntum: JS components & testing tools.
- ❖ Twitter: **@bryntum**

Who has heard of Ext JS before?

What is Ext JS?

Ext JS is a client-side JavaScript framework for building rich web applications.

Ext JS background & facts

- Began as a YUI extension in 2006, now v4.1
- Company called  **Sencha** (100+ employees)
- Funded by Sequoia Capital (Google, Yahoo, PayPal)
- Community Forum >400k

Ext JS features

- Full UI application development suite
- Widgets: grids, forms, trees, charts
- Data package, class system, MVC, Designer
- Windows-like look & feel, layout engine

When to use Ext JS

- Write web **applications** not web sites
- Typically LOB applications, intranet apps etc.
- Data intensive apps, gathering, displaying, filtering

When not to use Ext JS

- Write web sites (bbc.com, google.com, hm.com)
- Write sites or apps targeting mobile/tablet.
Use Sencha Touch or jQuery Mobile
- If SEO matters
- If initial page load time is critical

Traditional web dev pain points



Too much time spent defining the user interface



Browsers quirks

```
body.ie6 { display:crap; }
```

=> need hacks => uncertainty

Multiple authors of UI code



=== inconsistent look & feel.

=== easy to end up with function spaghetti

Testing is often an afterthought



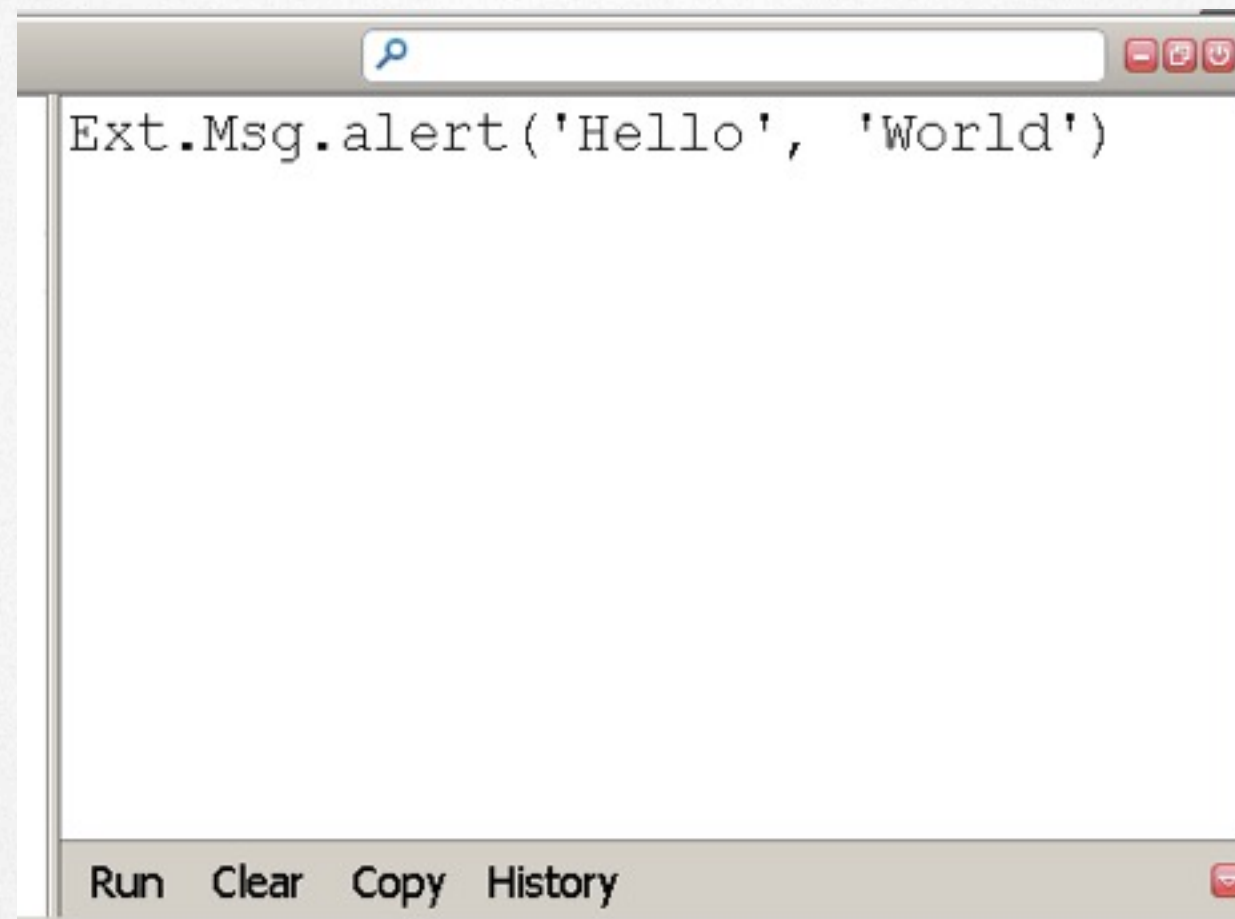
Pros of using Ext JS

- X-browser support, incl. the awesome **IE6**
- Simple, config-driven, standardized API
- Write business logic, not HTML tags
- You do not need a black belt in CSS.

Cons of using Ext JS

- Learning curve, huge API
- All eggs in one 1.3MB basket
- Can be tricky to theme
- Must like JavaScript

Hello World example



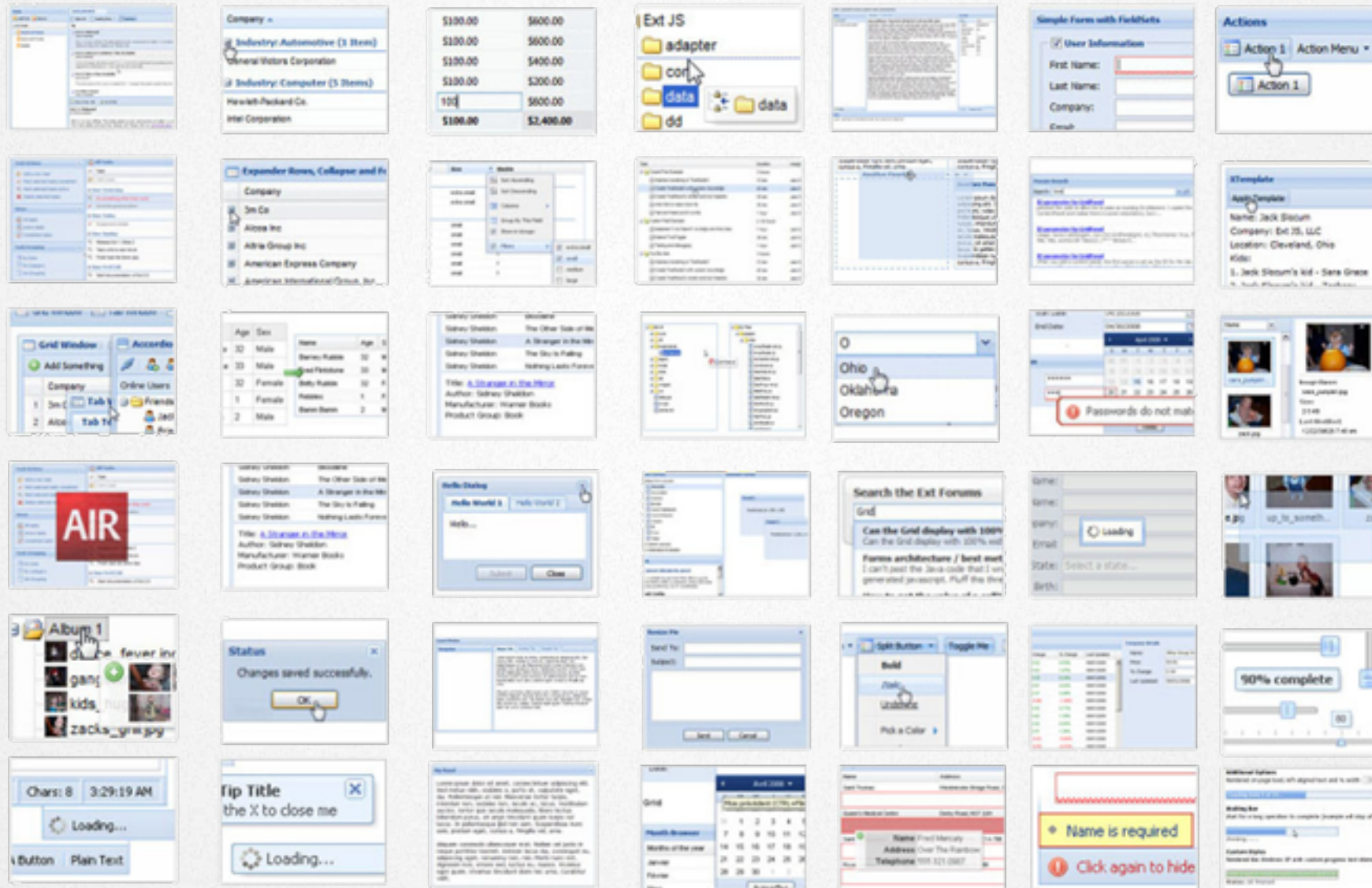
JavaScript centric

- Ext JS is all about OOP in JavaScript
- Only basic HTML/CSS skills required
- The Hello World alert one-liner:
 - generated a X-browser alert window.
 - no time was spent developing the UI/layout
- Typical Ext JS application is a single HTML page

Inside Ext JS 4

- Widgets
- Data package
- Class system / Component Model
- Layouts

Ext JS Widgets



Ext JS Widgets

- 80+ examples come with the Ext JS SDK
- Try yourself: <http://sencha.com/extjs/examples/>
- All widgets share a uniform API
- Any widget can be extended, features added.

Ext JS Grid Panel

Array Grid						
Company	Price	Change	% Change	Last Updated		
3m Co	\$71.72	0.02	0.03%	09/01/2010	⊖	⊕
Alcoa Inc	\$29.01	0.42	1.47%	09/01/2010	⊖	⊕
Altria Group Inc	\$83.81	0.28	0.34%	09/01/2010	⊖	⊕
American Express Company	\$52.55	0.01	0.02%	09/01/2010	⊖	⊕
American International Group, Inc.	\$64.13	0.31	0.49%	09/01/2010	⊖	⊕
AT&T Inc.	\$31.61	-0.48	-1.54%	09/01/2010	⊖	⊕
Boeing Co.	\$75.43	0.53	0.71%	09/01/2010	⊖	⊕
Caterpillar Inc.	\$67.27	0.92	1.39%	09/01/2010	⊖	⊕
Citigroup, Inc.	\$49.37	0.02	0.04%	09/01/2010	⊖	⊕
E.I. du Pont de Nemours and Company	\$40.48	0.51	1.28%	09/01/2010	⊖	⊕
Exxon Mobil Corp	\$68.10	-0.43	-0.64%	09/01/2010	⊖	⊕
General Electric Company	\$34.14	-0.08	-0.23%	09/01/2010	⊖	⊕
General Motors Corporation	\$30.27	1.09	3.74%	09/01/2010	⊖	⊕
Hewlett-Packard Co.	\$36.53	-0.03	-0.08%	09/01/2010	⊖	⊕

Ext JS Grid Panel

"...that grid is badass! It does everything. It cooks you dinner. It washes your car. It starches your shirts"

Ext JS Grid Panel

- Powerful and flexible table component
- Arguably the #1 reason to use Ext JS (was for me)
- Out of the box: sorting, column resizing, column reordering, row drag drop, grouping, editing etc...
- Numerous extensions and plugins available

Ext JS Forms

Form Fields

Text field:	<input type="text" value="Text field value"/>
Password field:	<input type="password"/>
File upload:	<input type="text"/> <input type="button" value="Browse..."/>
TextArea:	<div><div>Textarea value</div></div>
Display field:	Display field value
Number field:	<input type="text" value="5"/>
Checkbox:	<input type="checkbox"/> box label
Radio buttons:	<input type="radio"/> radio 1 <input type="radio"/> radio 2
Date Field:	<input type="text"/> <input type="button" value="Calendar"/>
Time Field:	<input type="text"/> <input type="button" value="Time"/>



Ext JS Forms


- Great for editing and entering data
- Available field types: text, password, number, file upload, text area, checkbox, radio, date, time.
- A form field can use vtypes to validate its value
alpha, alphanum, email, url
- Validation on the entire form or on individual fields.

Composite Fields





FieldContainers

Email Address:


Date Range:  

 Details

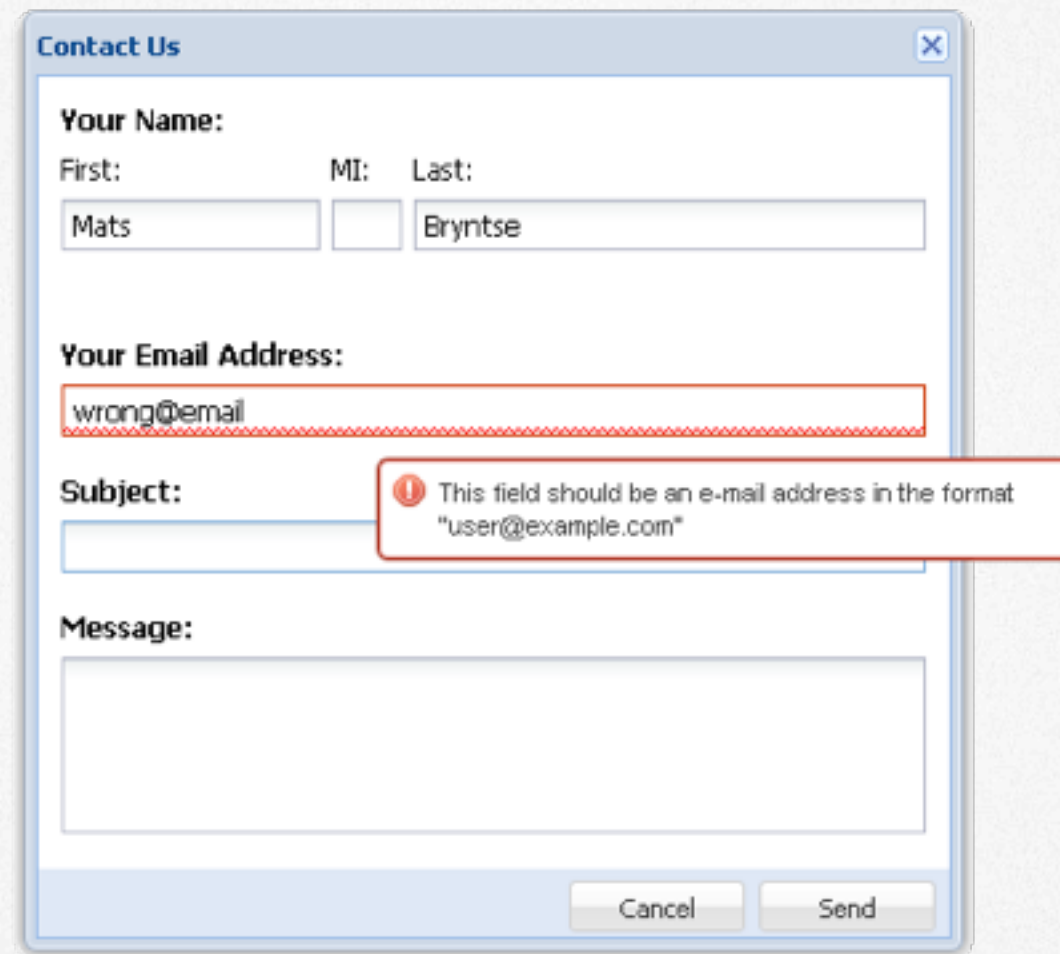
Phone: () -

Time worked:   hours   mins

Full Name:

Mrs 

Form validation



The image shows a 'Contact Us' form window. It contains the following fields:

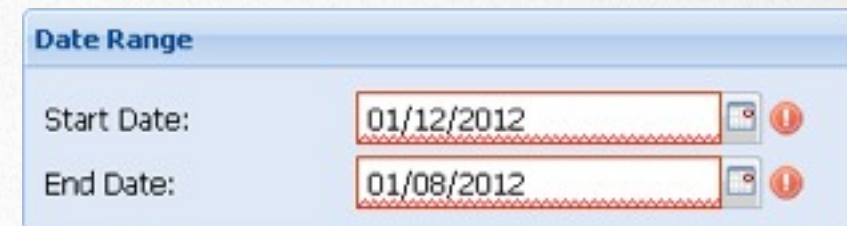
- Your Name:** Three input fields for 'First:', 'MI:', and 'Last:'. The 'First:' field contains 'Mats' and the 'Last:' field contains 'Bryntse'. The 'MI:' field is empty.
- Your Email Address:** An input field containing 'wrong@email'. This field is highlighted with a red dashed border, indicating a validation error.
- Subject:** An empty input field.
- Message:** A large empty text area.

A red error message box is displayed over the 'Subject' field, stating: 'This field should be an e-mail address in the format "user@example.com"'. At the bottom of the form are 'Cancel' and 'Send' buttons.

```
form.isValid(); // false
```


Ext JS Forms

- Flexible validation error messages
 - Individual, side
- Error summary

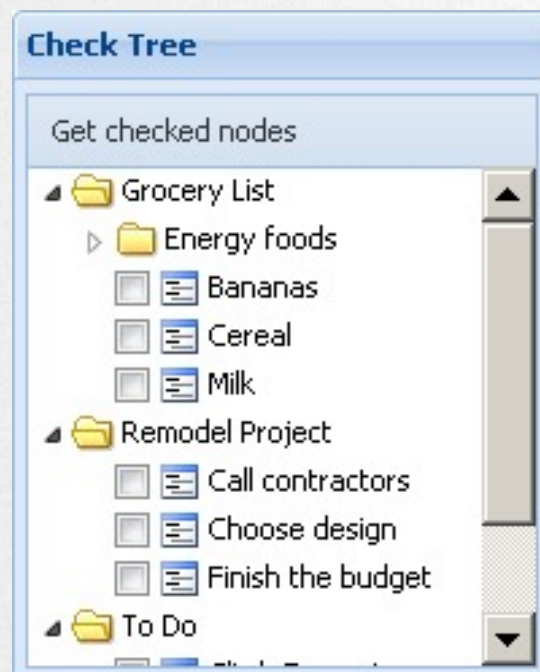


A snippet of a form titled "Date Range". It contains two input fields: "Start Date:" with the value "01/12/2012" and "End Date:" with the value "01/08/2012". Both input fields have a red dashed border and a red exclamation mark icon to their right, indicating validation errors.



A snippet of a form titled "Account Registration". It contains four input fields: "User Name:" with the value "Mats", "Email Address:" with the value "foo@bar", "Password:" with masked characters ".....", and "Repeat Password:" with masked characters "...". Below these fields is a checkbox labeled "I have read and accept the [Terms of Use](#)". At the bottom left, there is a red exclamation mark icon followed by the text "Form has errors". At the bottom right, there is a "Submit Registration" button.

Ext JS Tree Panel

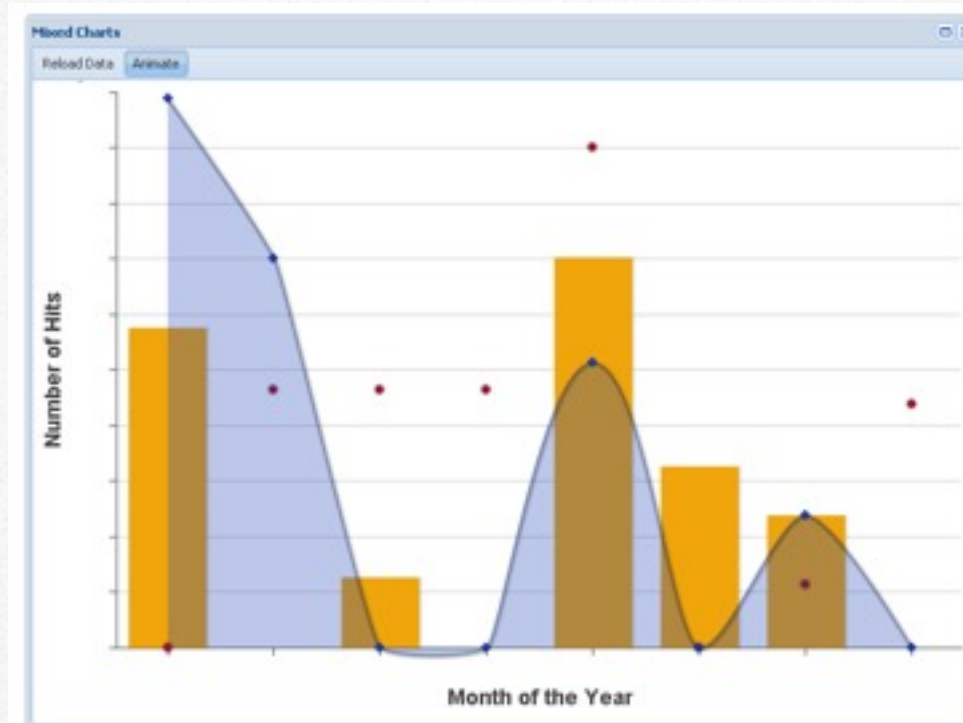


Core Team Projects		
Task	Duration	Assigned To
Project: Shopping	13h 15m	Tommy Maintz
Project: Testing	2h 0m	Core Team
Mac OSX	45 mins	Tommy Maintz
Windows	3h 45m	Darrell Meyer
Firefox	15 mins	Darrell Meyer
Safari	15 mins	Darrell Meyer
Chrome	15 mins	Darrell Meyer
Internet Explorer	3h 0m	Darrell Meyer
Linux	30 mins	Aaron Conran

Ext JS Tree Panel

- Great for displaying hierarchical data, backed by an **Ext.data.TreeStore**
- Supports animation, checkbox selection model, node reordering
- Also supports the features of GridPanel, column resize, reorder, hide/show, sorting etc.

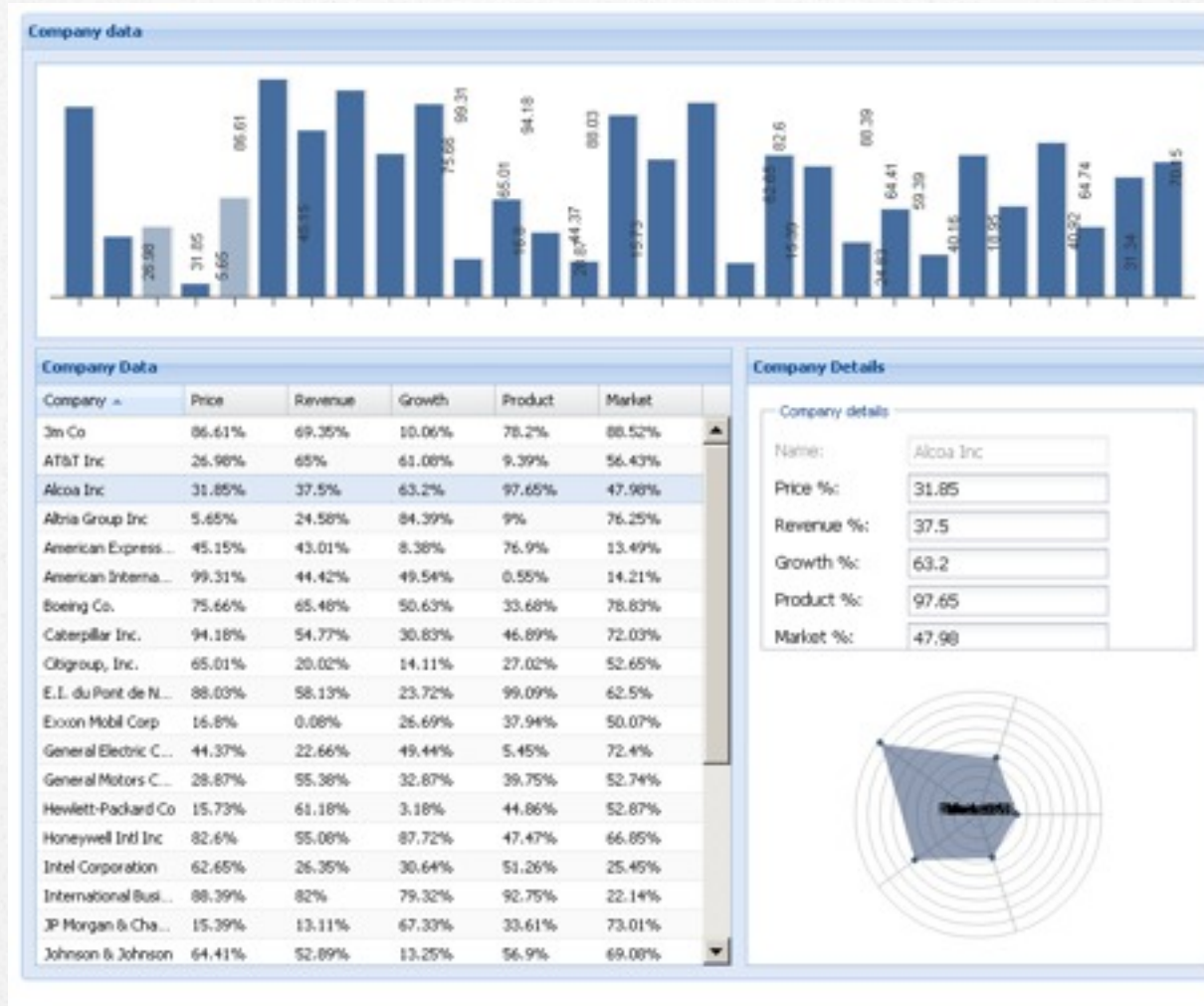
Ext JS Charts



Ext JS Charts

- Interactive X-browser charting package
- **SVG, VML** for (IE6/IE7/IE8)
- Rich interactivity, click, tooltips, animations

Charts Demo



Ext JS 4 Class System



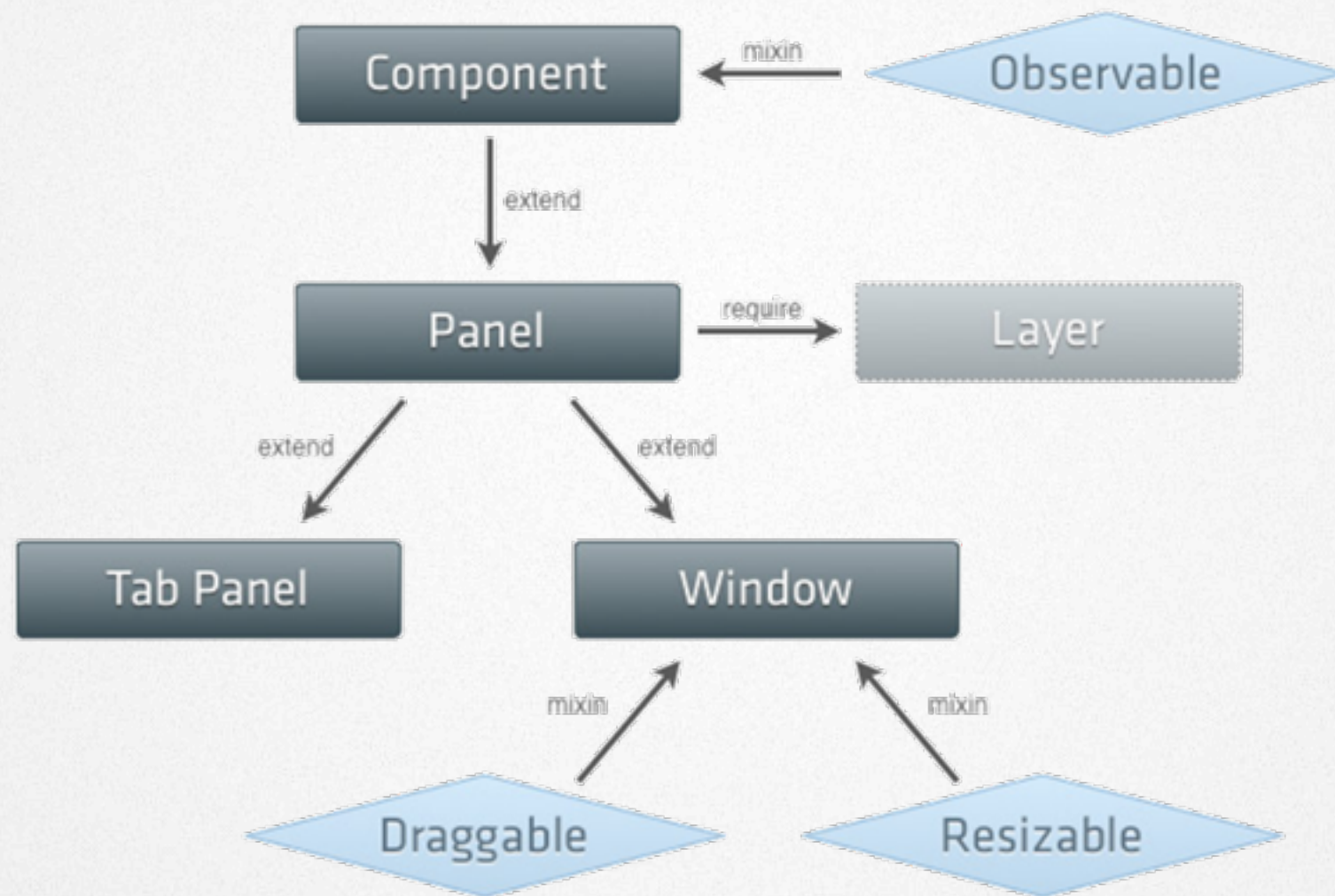
Ext JS 4 Class System

- Uniform way of defining classes and inheritance
- Classes are defined as strings
- **Mixins** allow you to define reusable behavior
=> multiple inheritance
- Dynamic class loading via Ext.Loader

Defining a simple class

```
Ext.define('MyWindowClass', {  
    requires    : ['SomeOtherClass'],  
    mixins     : ['Draggable' ],  
  
    myMethod  : function() { ... }  
});
```

Sample Ext Classes



Dynamic Loading

Why dynamic loading?

?

Classic JS app, week 1

```
<html>
  <head>
    <title>My App</title>
    <link href="style.css" rel="stylesheet" type="text/css" />

    <script type="text/javascript" src="class1.js"></script>
    <script type="text/javascript" src="class2.js"></script>

    <script type="text/javascript" src="app.js"></script>
  </head>
  <body>
  </body>
</html>
```

Classic JS app, week 5

```
<html>
  <head>
    <title>My App</title>
    <link href="style.css" rel="stylesheet" type="text/css" />

    <script type="text/javascript" src="somelib.js"></script>
    <script type="text/javascript" src="jquery.js"></script>
    <script type="text/javascript" src="wtflib.js"></script>
    <script type="text/javascript" src="foo.lib.js"></script>
    <script type="text/javascript" src="class1.js"></script>
    <script type="text/javascript" src="class2.js"></script>
    ...
    <script type="text/javascript" src="class73.js"></script>

    <script type="text/javascript" src="app.js"></script>
  </head>
  <body>    </body>
</html>
```


Instead:

```
Ext.define('MyWindowClass', {  
    extend : 'Ext.Window',  
    requires : ['SomeOtherClass'],  
    mixins : ['Draggable']  
});
```

Ext JS Data Package



Benefits of the data package

- Uniform way of loading and writing data
- Most Ext JS UI components use stores & models
- UI components have no inherent knowledge about the data they display

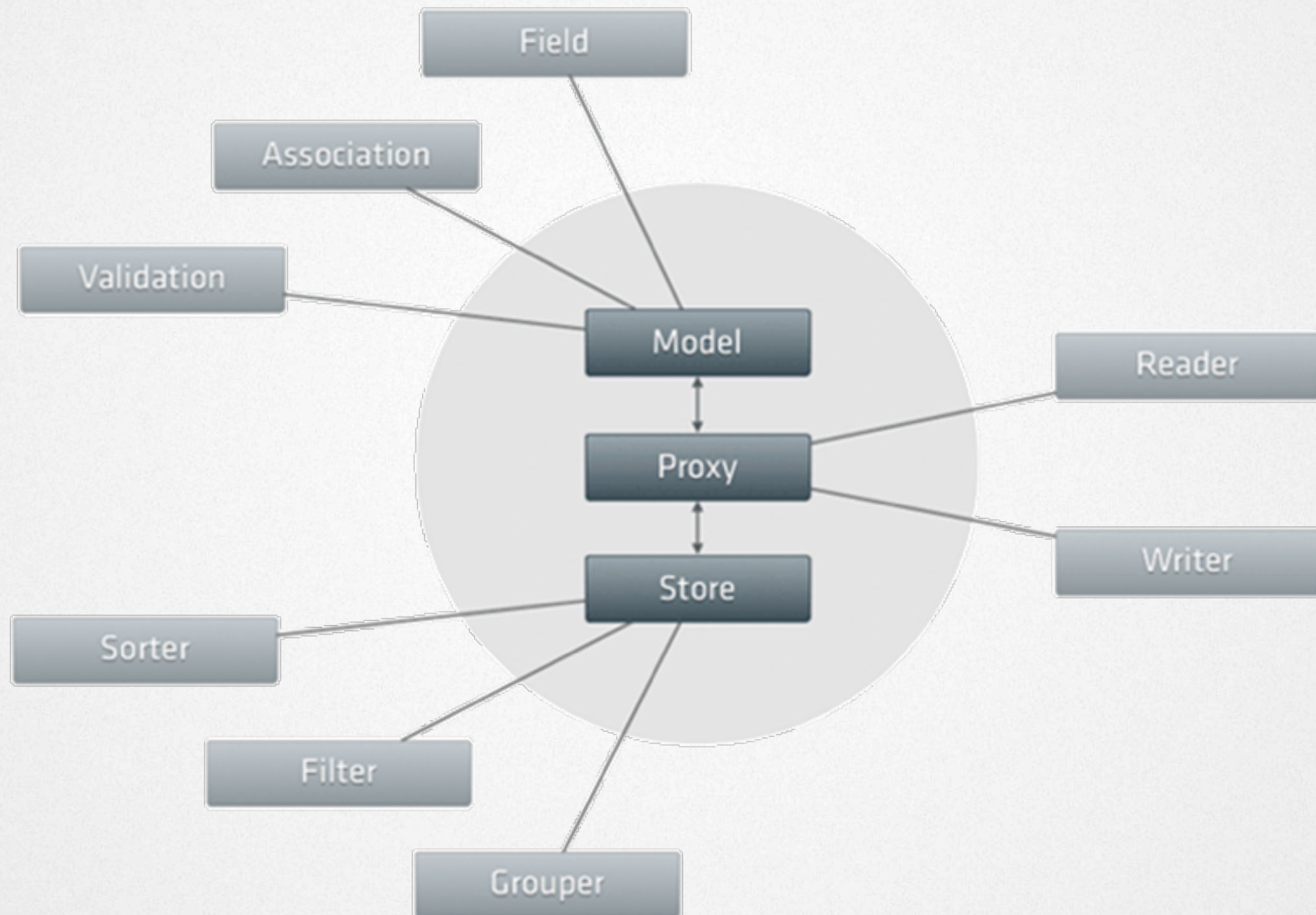
DataReader & Proxy

- A DataProxy fetches raw, unformatted data from different types of sources.
HttpProxy, JSONP, LocalStorage, SessionStorage etc
- A DataReader is used to parse the raw data into a **Model** instances (e.g. after an AJAX request)
Built-in support for JSON, XML and arrays

Model & Store

- A Model is a client side representation of a DB table (User, Order, OrderRow). A model
 - * has a number of fields (e.g. "id", "name", "email")
 - * keeps track of its field changes
 - * usually belongs to a **Store**
 - * can be Associated with other Models
- A Store represents a client side cache of **Model** objects.
 - * Provides input data for GridPanel, ComboBox
 - * Store supports filtering, grouping, sorting etc.

Ext JS 4 Data Package



DEMO: Complex App

Review: Web Desktop

- Powerful web app simulating a desktop interface
- All widgets:
 - user treelist
 - company table
 - system status charts

=> all backed by the Ext.data.Store class
- No time spent inventing advanced CSS layouts.

Ext JS Component Model



Component Model

- Ext.Component: base class for all Ext components
- Popular components:
 - Ext.form.TextField
 - Ext.TreePanel
 - Ext.GridPanel
 - Ext.Window
- Managed life cycle, template method hooks
 - constructor
 - initComponents
 - onRender
 - afterRender
 - onDestroy

Component Model

```
Ext.define('MyUserForm', {  
    extend : 'Ext.FormPanel',  
    height : 200,  
  
    initComponents : function() {  
        this.nameField = new  
Ext.TextField(..);  
  
        this.callParent(arguments);  
    }  
});
```

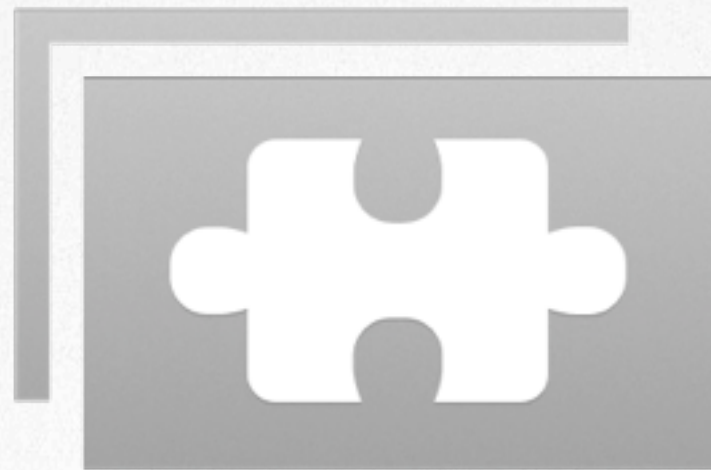
Extending Components

- Very simple to extend existing components
- Add your own custom features and functionality
- Benefit from the Ext Component lifecycle, managed instantiation and destruction
- Our Bryntum Gantt chart extends Ext.TreePanel

Extending Components

```
Ext.define('My.GanttChart', {  
    extend      : 'Ext.tree.Panel',  
    requires    : ['My.TaskStore'],  
  
    initComponents: function() {  
        // Do stuff...  
        this.callParent(arguments);  
    },  
    renderBars    : function() { ... }  
});
```

Custom Components



- Sencha forum section for community extensions
- <http://market.sencha.com> => share, buy or sell

Ext JS 4 Layouts

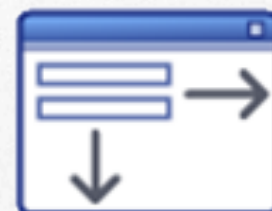


Ext JS 4 Layouts

- An Ext.Container can contain child Components
- Choose from several built in layouts:
border, absolute, column, hbox, table, card, etc.
- Easy to produce complex layout structures. Nest as deep as you want.

Ext JS 4 Layouts

- Example: Complex layout



Let's build something

Mission: Build a simple scrum board

Testing Ext JS apps

- Jasmine
- Selenium (tricky)
- Siesta
- PhantomJS (headless WebKit)

Additional Resources

- sencha.com/learn
- sencha.com/docs
- sencha.com/forum/
- sencha.com/blog/

Thanks for listening!

Questions?



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[@bryntum](https://twitter.com/bryntum)