



Web Terminal

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Small company (only 6 employees)

- ❑ Founded by Wouter and Mathieu van Echtelt

Amsterdam **G**roningen 2005



- ❑ Competence management for Fire Departments
- ❑ Automate administrative tasks
- ❑ Web application

Visit us at <http://cosmocows.com>

Agenda

- Brief history
- Architecture
- Client side
- Server side
- Demo



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Agenda

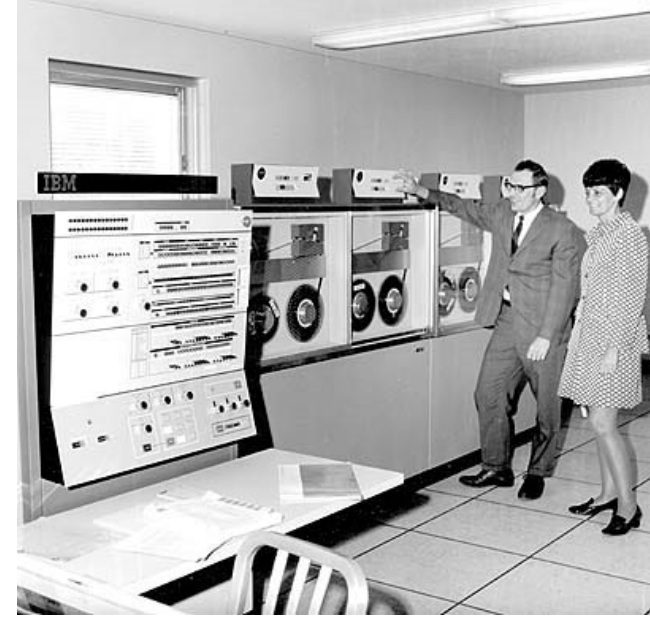
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In the beginning...

- Mainframe era
- Client is text terminal
- Pros:
 - Centralized application management
- Cons:
 - Client is powerless without server



The computer gets personal

- PC era
- Computing power for the masses
- Pros:
 - Application 'freedom'
- Cons:
 - Decentralized application management



The rise of the GUI



- **W**indow **I**con **M**enu **P**ointer
- Rich desktop applications
- Pros:
 - Adoption of **M**odel-**V**iew-**C**ontroller
- Cons:
 - Increased complexity
- Multidisciplinary development teams



Web applications mature

- **Rich Internet Applications**
- Client/server architecture is back
- Pros:
 - Centralized application management
- Cons:
 - Even more complexity to deal with...



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Client/server architecture



Modern browser

- ❑ IE6+, Firefox2+, ...

Javascript support

- ❑ No Flash or other plugins

Behind firewall

- ❑ Simple request/response
- ❑ No Comet for server push

Only for dynamic content

- ❑ Apache for static resources

Use MVC

- ❑ Separate presentation from domain objects
- ❑ Reuse existing domain logic
- ❑ Rebuild presentation logic



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Web Terminal



Render rich user-interface

- ❑ Input field, image, button, ...

Record user-interactions

- ❑ Selections, text entry, ...

Report changes to server

- ❑ XMLHttpRequest
- ❑ Server responds with user-interface updates.

Compute user-interface

- ❑ Maintain MVC objects

Replay user-interactions

- ❑ Talk to controller objects

Update user-interface

- ❑ Record view updates

Report updates to terminal



Delta protocol



Synchronize user-interface

- ❑ Rich user-interface on client side
- ❑ Virtual user-interface on server side

Communicate significant changes

- ❑ Ignore mouse/keyboard events

Use high-level UI components

- ❑ Not bitmaps like X Window System



Common GUI widgets

- *Non-interactive*: Label, image, ruler, ...
- *Buttons*: Pushbutton, link button, image button
- *Input*: Text input, date input, checkbox, ...
- *Selection*: Listbox, radio list, tab list, tree list, ...
- *Group*: Panel, grid layout, widget table, ...
- *Holder*: Groupbox, widget holder, page
- *Special*: Hyperlink, HTML container

Sufficient for administrative applications...



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Browser technologies

- Javascript is only available option
- Prototype library
 - Classes and inheritance (`$super`)
 - Added our own mixin implementation
- jQuery
 - Date picker and other jQuery plugins
- Xinha
 - Rich text editor



Browser issues

- DOM manipulation can be very slow
 - Only Internet Explorer, but ...
 - Rewrote rendering mechanism to avoid DOM
- Annoying browser differences
 - Poor CSS support in IE6
 - Event handling
- Missing or poor debugging support



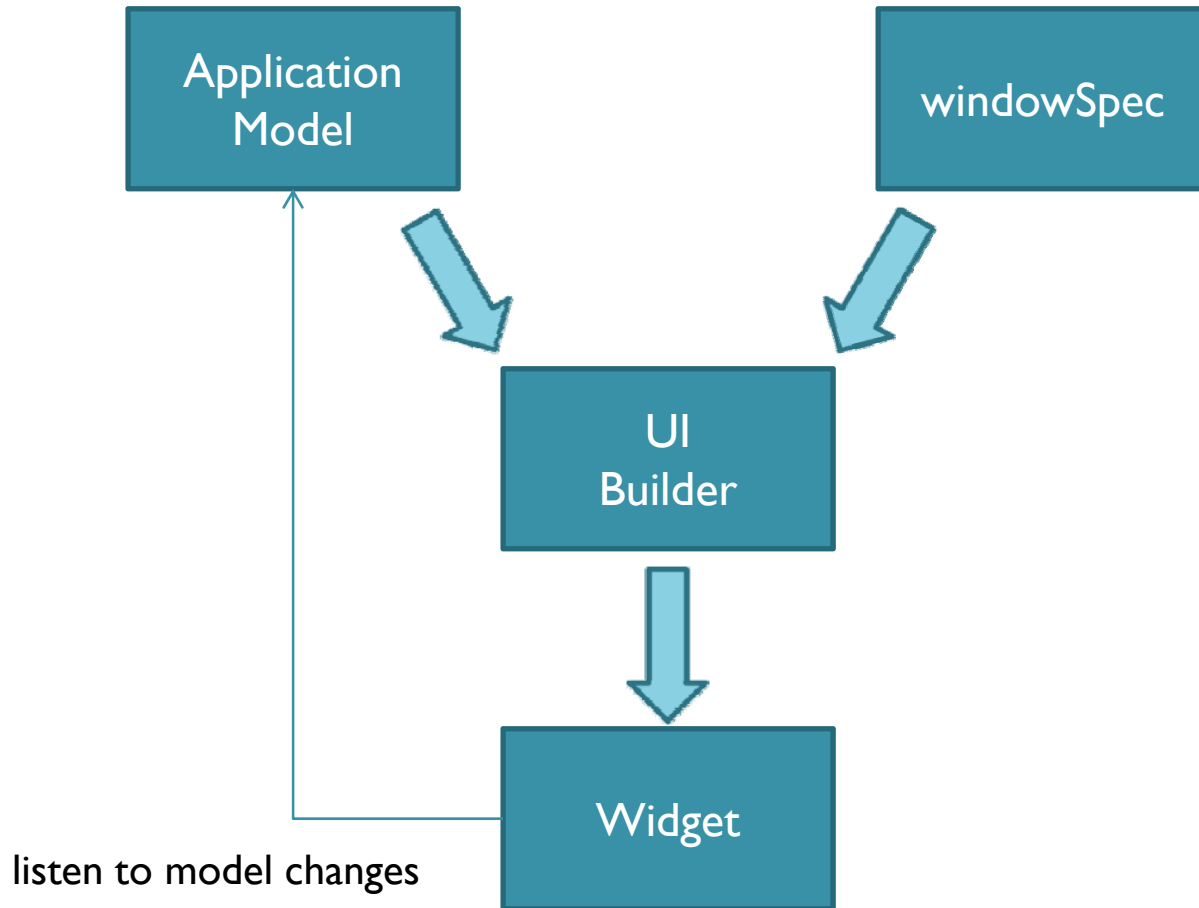
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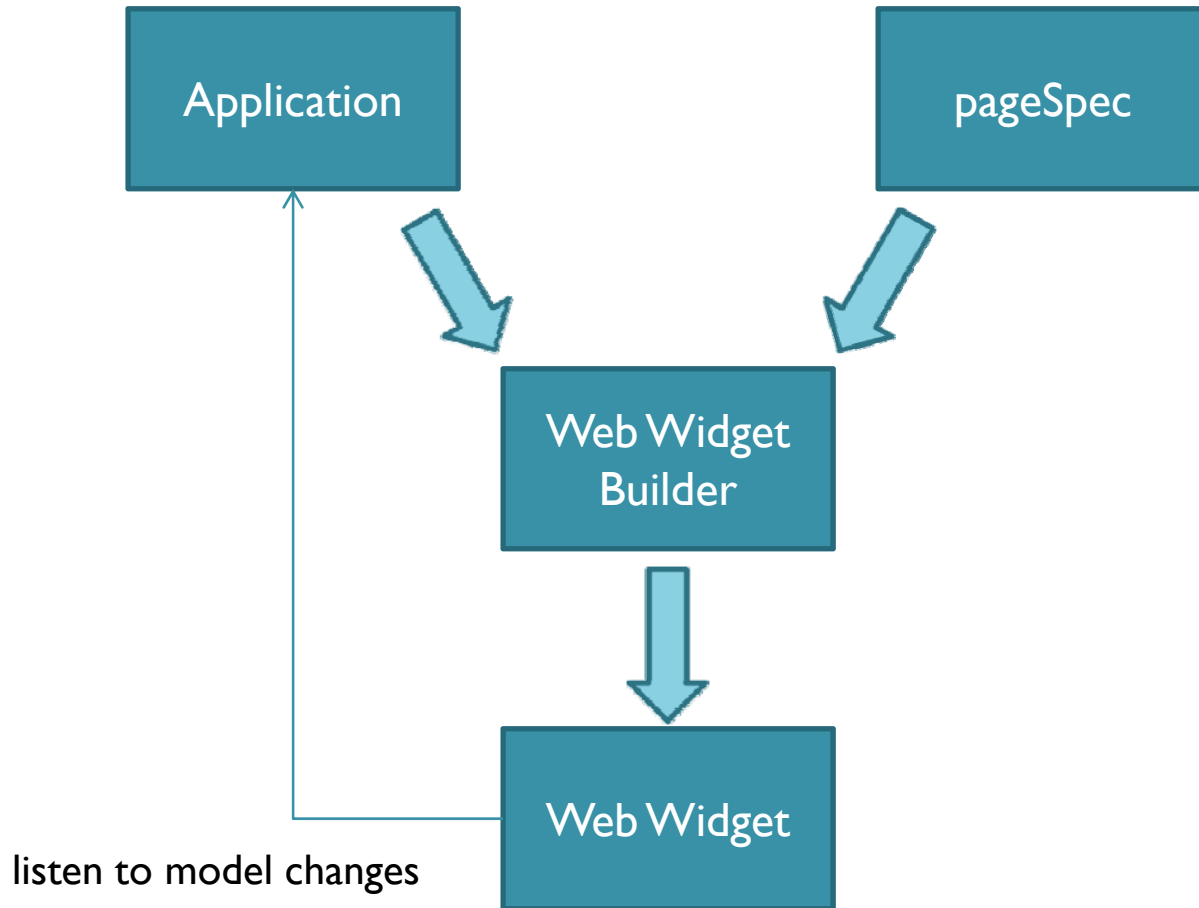
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Smalltalk applications



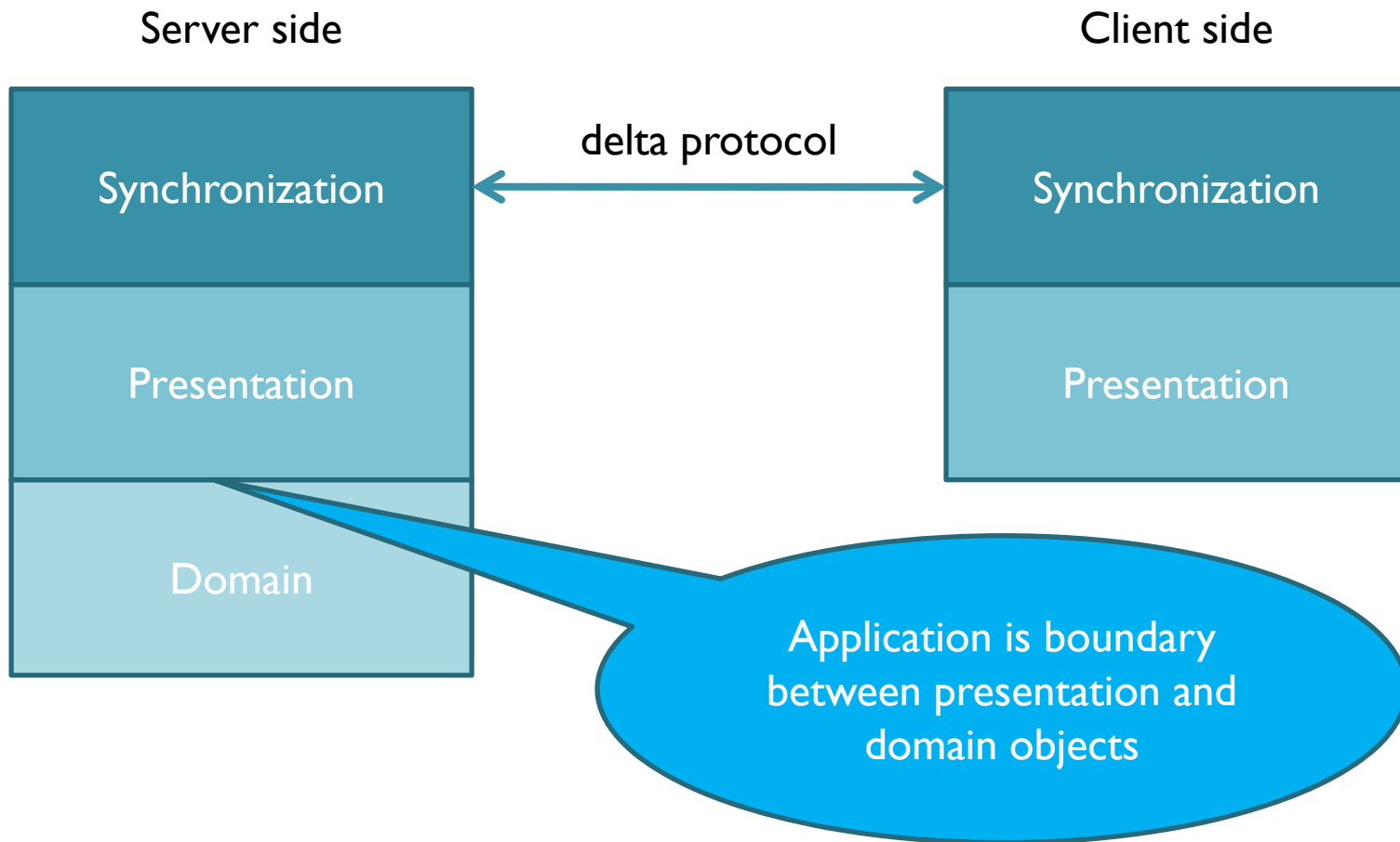
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Web Terminal applications



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Software stacks



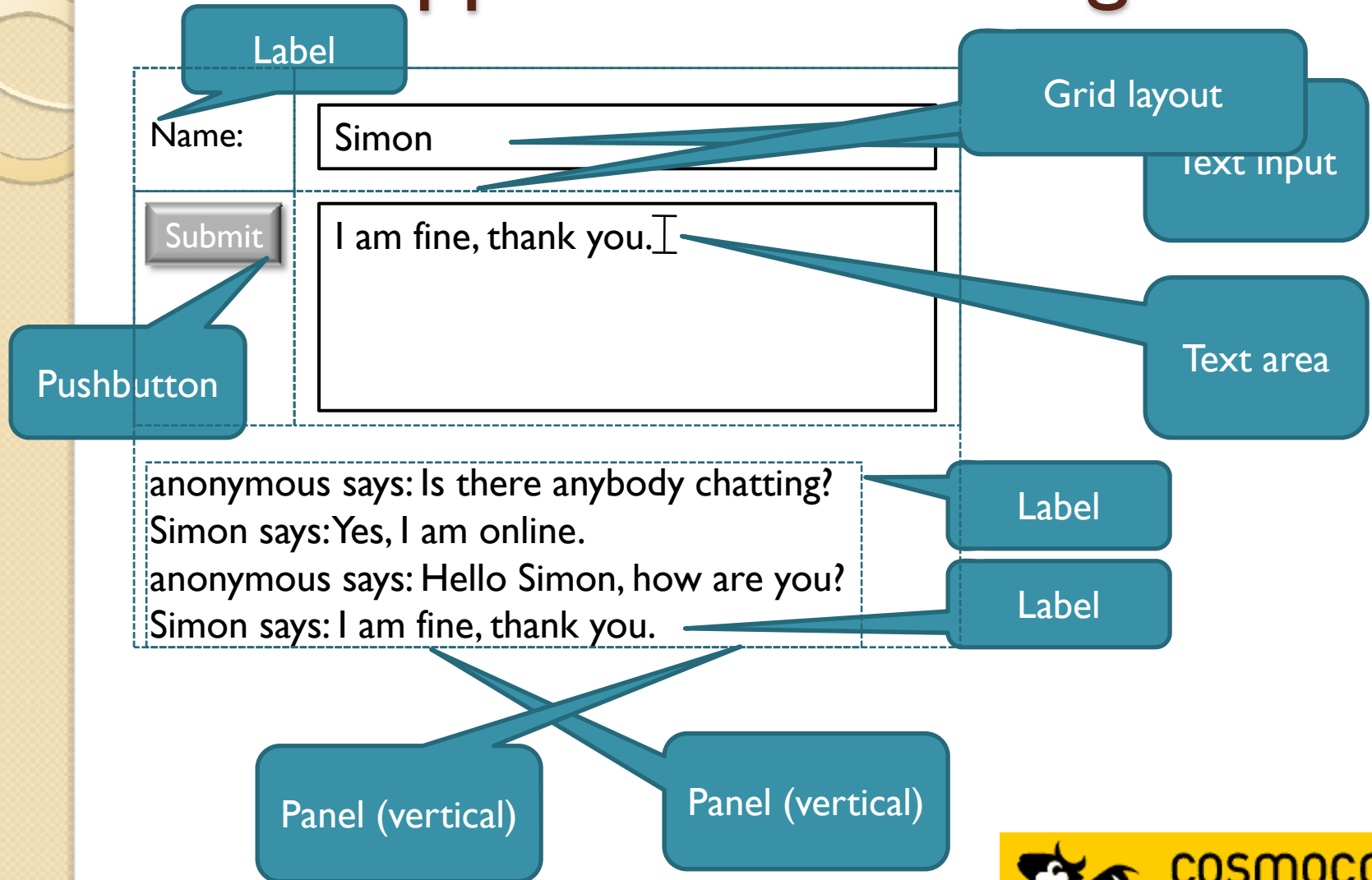
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Chat application: UI design



Chat application: pageSpec (1/2)

```
(PanelSpec new)
  beVertical;
  addSpec:
    ((GridLayoutSpec new)
      columnWidths: (Array with: 100 px with: 'auto');
      rowHeights: #(#auto #auto);
      specAt: 1 @ 1 put: (LabelSpec label: 'Name:');
      specAt: 2 @ 1 put: (TextInputSpec new aspect: #name);
      specAt: 1 @ 2 put: ((PushButtonSpec new)
        label: 'Submit';
        aspect: #submit;
        acceleration: 'enter';
        yourself));
```



Chat application: pageSpec (2/2)

```
specAt: 2 @ 2 put: ((TextAreaSpec new)
                    aspect: #text;
                    rows: 5;
                    yourself));
```

addSpec:

```
((RepeaterSpec new)
 collectionAspect: #messages;
 spec: ((FX.WebTerminal.LabelSpec new)
        labelAspect: #yourself;
        yourself);
 yourself)
```

yourself



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