

**A Dialog Control Framework  
for Hypertext-based Applications**

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GI-Informatiktage, November 8, 2002 1/26

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  - Motivation
- Dialog Flow Notation
  - Dialog Elements and Graphs
  - Dialog Modules and Nesting
- Dialog Control Framework
  - Dialog Flow Specification Language
  - Framework Architecture

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**Evolution of Web Sites**

Complexity

+ ideal thin clients  
- limited user interface

Information Interaction Transaction Application

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**Hypertext Application (Step 1)**

www.MatthiasBook.de  
Discussion Forum

Forum	Topics	Posts	Last Post
General	0	0	No Posts
Travel	4	9	Sat Apr 27, 2002 8:44 am [Last Post]
Papers	0	0	No Posts

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**Hypertext Application (Step 2)**

www.MatthiasBook.de  
Discussion Forum

**Travel**

Topics	Replies	Author	Views	Last Post
Norway trip	2	stasaa	3	Sat Apr 27, 2002 8:44 am [Last Post]
Alaska	1	danonaid	2	Sat Apr 27, 2002 8:40 am [Last Post]
Igneous Falls	1	stasaa	4	Sat Apr 27, 2002 8:38 am [Last Post]
Going someplace warm...	1	stasaa	3	Sat Apr 27, 2002 8:26 am [Last Post]

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**Hypertext Application (Step 3)**

www.MatthiasBook.de  
Discussion Forum

Please enter your username and password to login

Username:

Password:

Log me on automatically each visit:

Powered by phpBB 2.0.0 © 2001 phpBB Group

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### Hypertext Application (Step 4)

The screenshot shows a Netscape browser window displaying a registration form. The form is titled 'Registration Information' and includes fields for Username, Email address, Password, and Confirm password. Below this is a 'Profile Information' section with fields for ICQ Number and AIM Address. The browser's address bar shows the URL 'http://www.matthiasbook.de/forum/protile.php?mode=register&step=4'.

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### Hypertext Application (Step 5)

The screenshot shows the same browser window after registration. A message box states: 'Thank you for registering, your account has been created. You may now login with your username and password. Click [here](#) to return to the Index.' The browser's address bar shows the URL 'http://www.matthiasbook.de/forum/protile.php'.

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### Hypertext Application (Step 6)

The screenshot shows the forum index page. It features a table with columns for Forum, Topics, Posts, and Last Post. The 'Travel' forum is highlighted, showing 4 topics and 9 posts. The browser's address bar shows the URL 'http://www.matthiasbook.de/forum/index.php'.

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### Conceptual Models of Dialog Flows

**Window based application**

**Hypertext based application**

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### Media Dependent Dialog Flows

**Example: Online Shop Checkout**

The diagram illustrates the flow of data between three devices: a laptop, a PC, and a mobile phone. 
 

- The laptop sends 'Address, shipping and billing data' to the PC.
- The PC sends 'Address mask', 'Shipping mask', and 'Billing mask' to the mobile phone.
- The mobile phone sends 'Address data', 'Shipping data', and 'Billing data' back to the PC.

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### Need for a Dialog Control Framework

- Problems:
  - Dialog flows cannot be nested
  - Dialog flows vary on different media
  - Dialog control logic often complex, neglected
- Wanted:
  - Reusable solution for any app
  - Dialog Control Framework
  - Dialog Flow Notation

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## Dialog Graph

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## Dialog Module

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## Nesting Dialog Modules

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## Event Semantics

- events are results of elements, not calls to them
  - same event generated by same element may lead to different elements in different contexts
- module reusability and flexibility

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## Multiple Presentation Channels

Example: Online Shop Checkout

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### Key Notation Features

- Consecutive, fine-grained actions or masks
  - flexible dialog graphs
- Dialog modules encapsulate dialog graphs
  - reuse in different contexts, nesting
- Events are results, not calls
  - dialog control not performed by model or view
- Advanced features (*not shown here*)
  - complex dialog structures

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### From Spec to Implementation

- Req Analysis, Specification, Design phase
  - dialog flow specification refined incrementally
- Implementation Phase
  - smooth, efficient transition desired
  - diagrams serve as input for framework

Translation

XML Dialog Flows Doc XML Dialog Elems Doc

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### User Authorization Flow Spec

```

<dfs-flows>
...
<in-module name="User Authorization">
  <channel name="HTML">

    <on-init>
      <call-action>check login status</call-action>
    </on-init>

    <ex-action name="check login status">
      <on-event name="not yet logged in">
        <call-mask>Login</call-mask>
      </on-event>
      <on-event name="already logged in">
        <call-action>has admin rights?</call-action>
      </on-event>
    </ex-action>
  ...
  
```

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### Front Controller Architecture

- Dialog Flow Specification, Dialog Control Logic distributed over all actions
  - inflexible dialog flow specification
  - limited dialog control capabilities
  - no support for different channels' interaction patterns

Client Controller View Model

Request Set view Dispatch Forward Extract Update

Response

Dialog Spec, Control Logic Application Logic Action

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### Dialog Ctrl Framework Architecture

Client Channel Interface Dialog Controller Mask Model


Request Event Forward Extract Update

Response

Compound Stack OO Dialog Flow Model XML Dialog Flows Doc XML Dialog Elems Doc

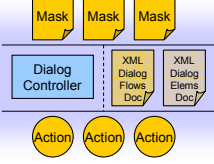
push, pop, top Look up Import


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### Advantages of DCF Architecture

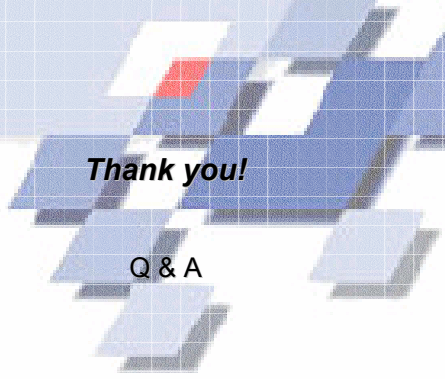
- strict separation of tiers
  - presentation logic
  - dialog control logic
  - dialog flow specification
  - application logic





- reusability, maintainability
- presentation channel independence
- support for complex dialog structures
- black-box reuse of framework

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**Thank you!**

Q & A

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