

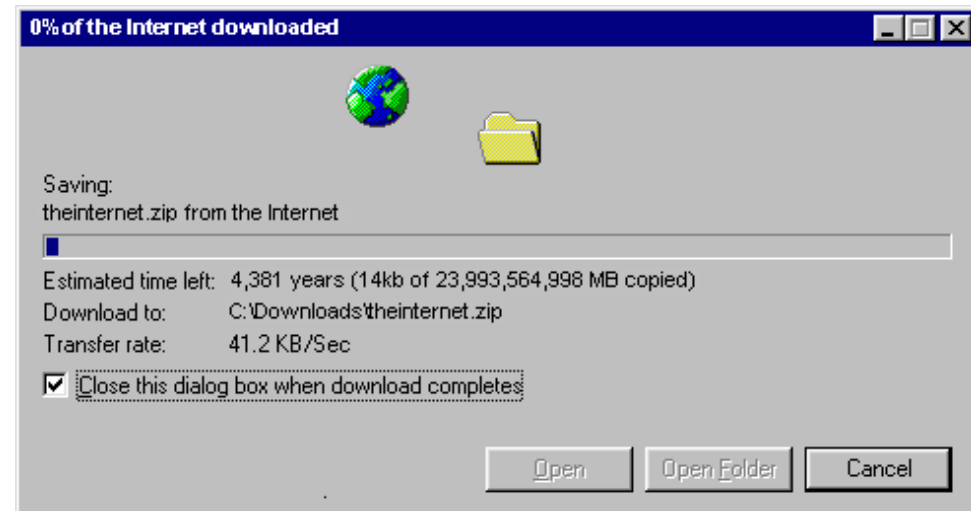
Web-Enabled Information Systems

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Components of Data-Intensive Systems

■ Presentation

- Primary interface to the user
- Needs to adapt to different display devices (PC, PDA, cell phone, voice access, ...)

■ Application (“business”) logic

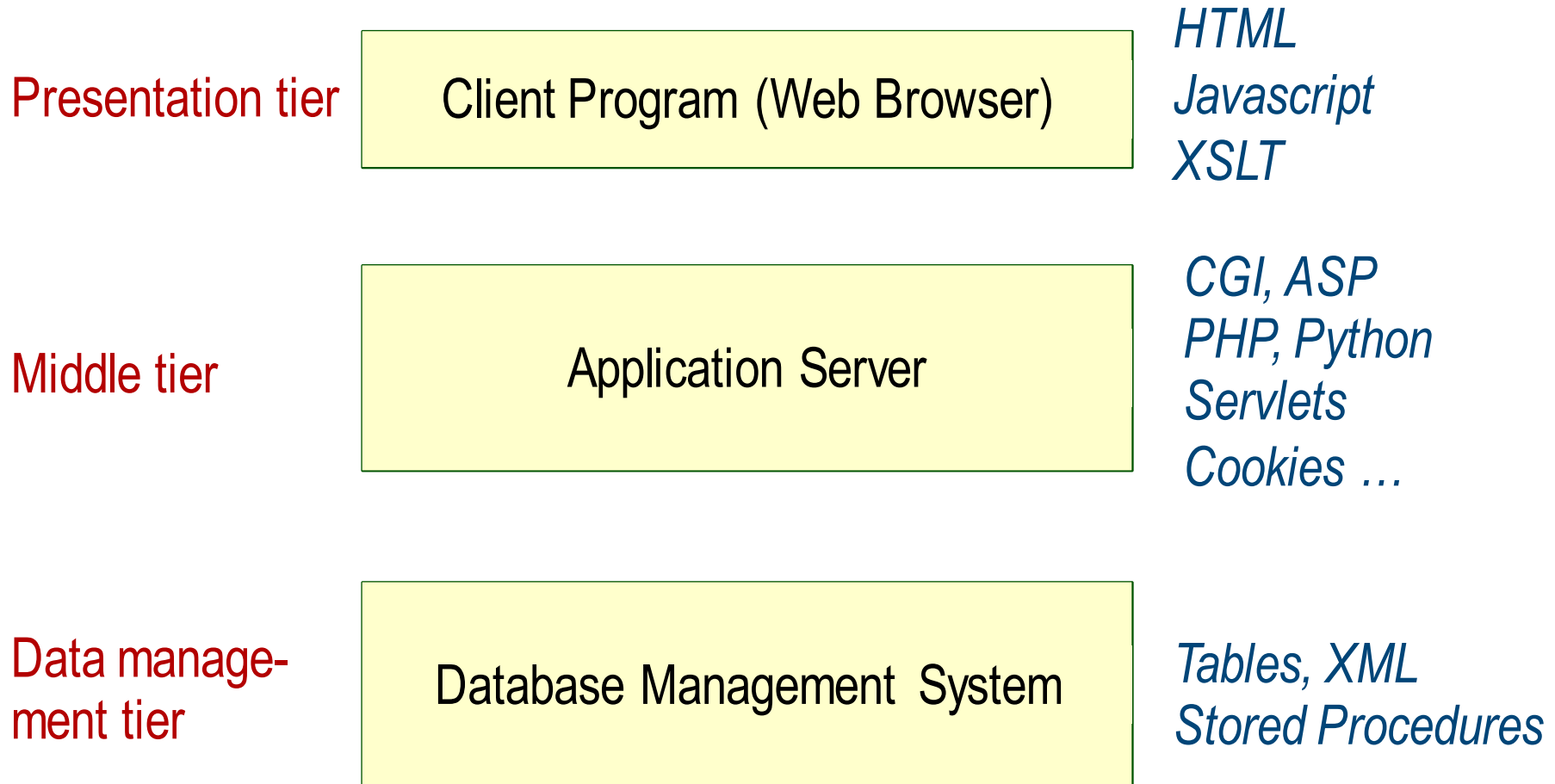
- Implements business logic (implements complex actions, maintains state between different steps of a workflow)
- Accesses different data management systems

■ Data management

- One or more standard database management systems

■ single system or distributed

Three-Tier Architecture



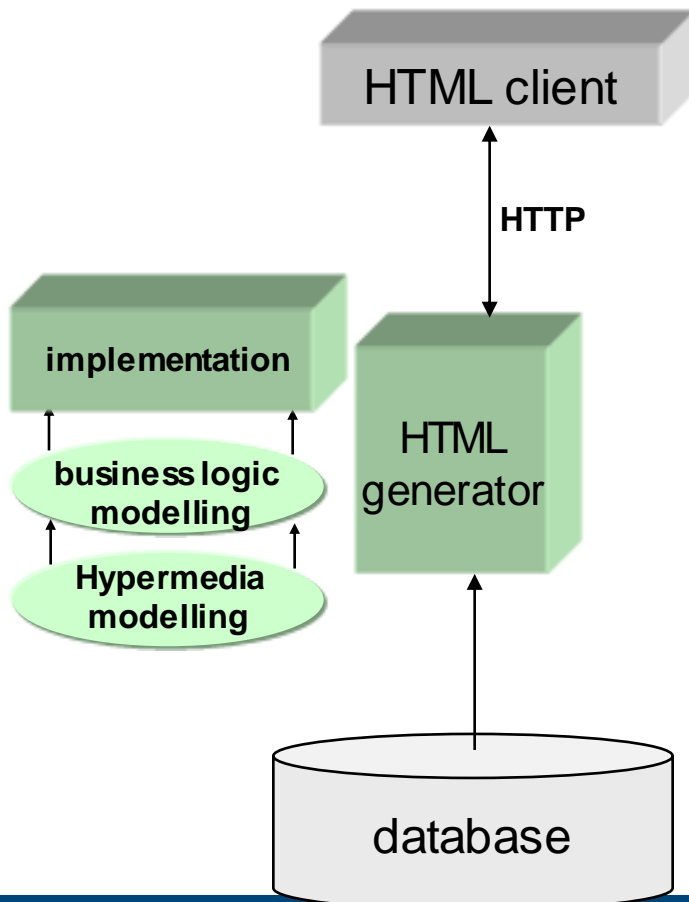
Content Management Systems

- Historically: **Document Management Systems (DMS)**
 - (scanned) documents = facsimile + searchable records
 - Company internal
- Then: **Content Management Systems (CMS)**
 - Everything *maintained electronically*
 - text, images, audio, video + links
 - Company internal
- Now: **Web Content Management Systems (WCMS)**
 - Browser as GUI (web authoring), High emphasis on appearance, availability, security
- **Component / Enterprise CMS**
 - Use componets to build up douments (single source of information)
 - The latter is focused on whole business management, not just web authoring

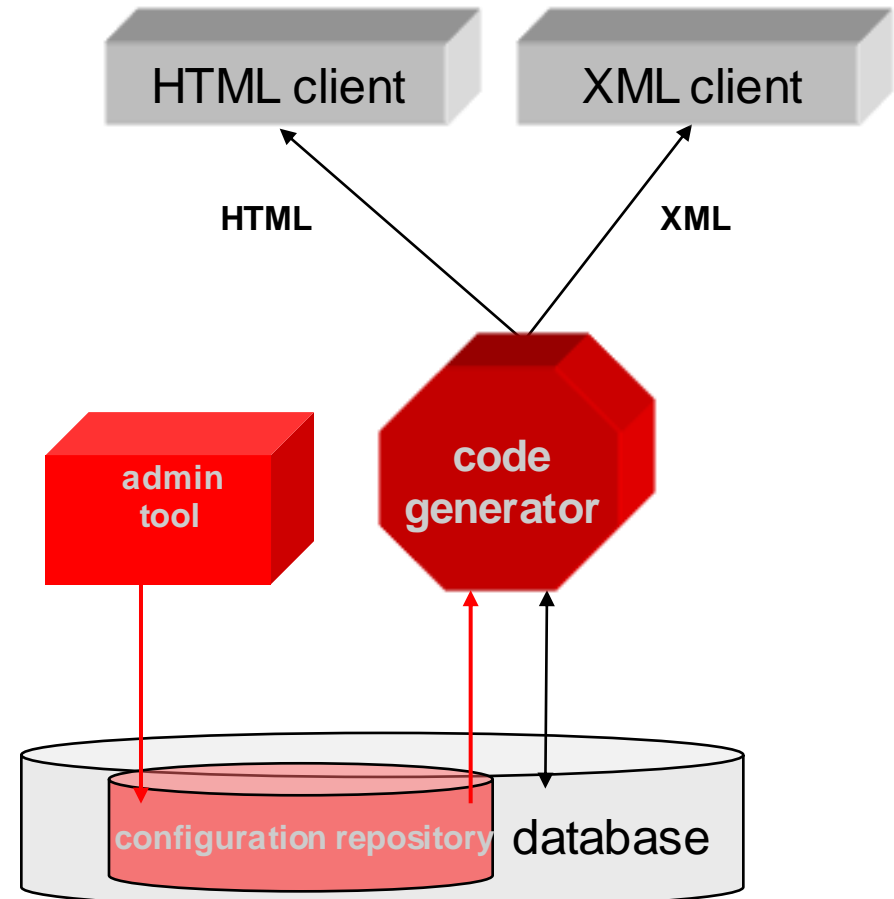
related:
**Workflow
Management
Systems (WMS)**

Schematic WCMS Architecture

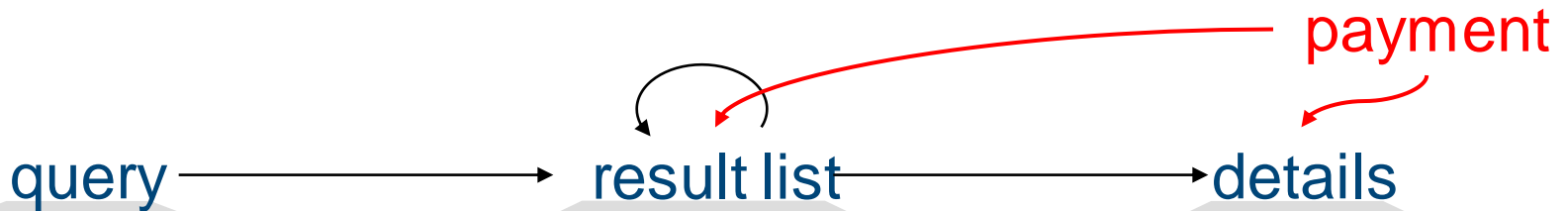
- Variant 1:
hard-coded business logic



- Variant 2:
configured business logic



Standard Web Retrieval Cycle



Volltextsuche

Suchbegriff:

Dieses Menü bietet die Möglichkeit sowohl der gruppenbezogenen als auch der werkstoffübergreifenden Materialsuche. Hier können Sie einen beliebigen Suchbegriff angeben, wobei gilt:

- Je kürzer der Suchbegriff, desto höher die Trefferwahrscheinlichkeit
- Ein Trunkierungszeichen (joker, wild card, z.B. *) darf nicht verwendet werden.
- Die Beachtung von Groß- bzw. Kleinschreibung ist nicht notwendig.

Als Suchergebnis erhalten Sie eine Liste von Werkstoffen, die den gesuchten Text enthalten. Über [Anzeigen](#) rufen Sie die Werkstoffdaten des einzelnen Werkstoffes auf. Eine mehrfach verfeinerte Suche innerhalb der gefundenen Treffermenge ist möglich, d.h. die Treffermenge lässt sich durch Eingabe von Kennwerten, des Werkstoffnamens oder der -gruppe sowie über erneute Volltextsuche weiter eingengen.

Beispiel:
Bei Eingabe von "vergüt" werden alle Werkstoffe ausgegeben in denen der Wortstamm "vergüt" vorkommt: Vergütungsstahl, vergütet, vergütbar, Vergütungsquerschnitt, Vergütungsstahlguss usw. Geben Sie hingegen das Wort "Vergütungsquerschnitt" ein, dann werden nur die Werkstoffe gefunden, bei denen das Wort "Vergütungsquerschnitt" explizit im Datenblatt enthalten ist.

Volltextsuche

Suchbegriff:

Nr.	Werkstoff	Details
6	Werkstoffnum: 1.0605 Kurzbezeichnung: C75 / C 75 / Normbezeichnung: DIN 17222 / Beschreibung: Federstahl	Anzeigen
7	Werkstoffnum: 1.0606	Anzeigen
8	Werkstoffnum: 1.0606	Anzeigen
9	Werkstoffnum: 1.0607	Anzeigen
10	Werkstoffnum: 1.0607	Anzeigen

<<< vorherige Treffer insgesamt: 139 nächste >>>

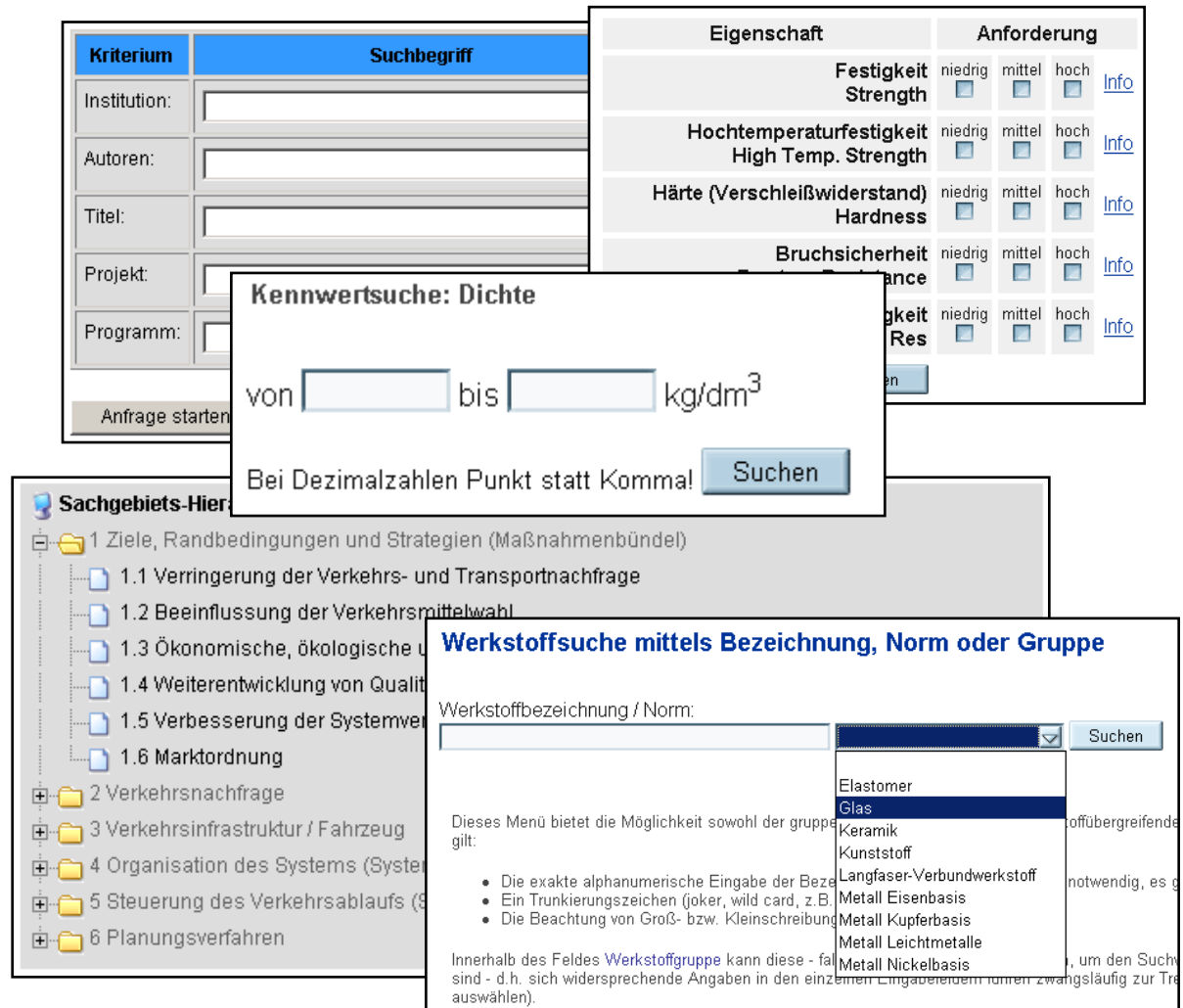
Werkstoffdaten

Werkstoffbezeichnung:	neue Kurzbez.: GE300 / alte Kurzbez.: GS-60.3 /
Normverweis:	Norm: E DIN 17205-3 /
Werkstoffgruppe:	Metall Eisenbasis
Zustand:	normalisiert
Beschreibung:	Stahlguss für allgemeine Anwendungen
Eigenschaften:	mechanisch und thermisch physikalisch weitere

automatic scroll controls

Query Mechanisms

- One or more form entries
- Qualitative / fuzzy search
- Advanced search criteria, including joins
- Drop-down lists generated from database contents
- Tree-based & other representations using JavaScript

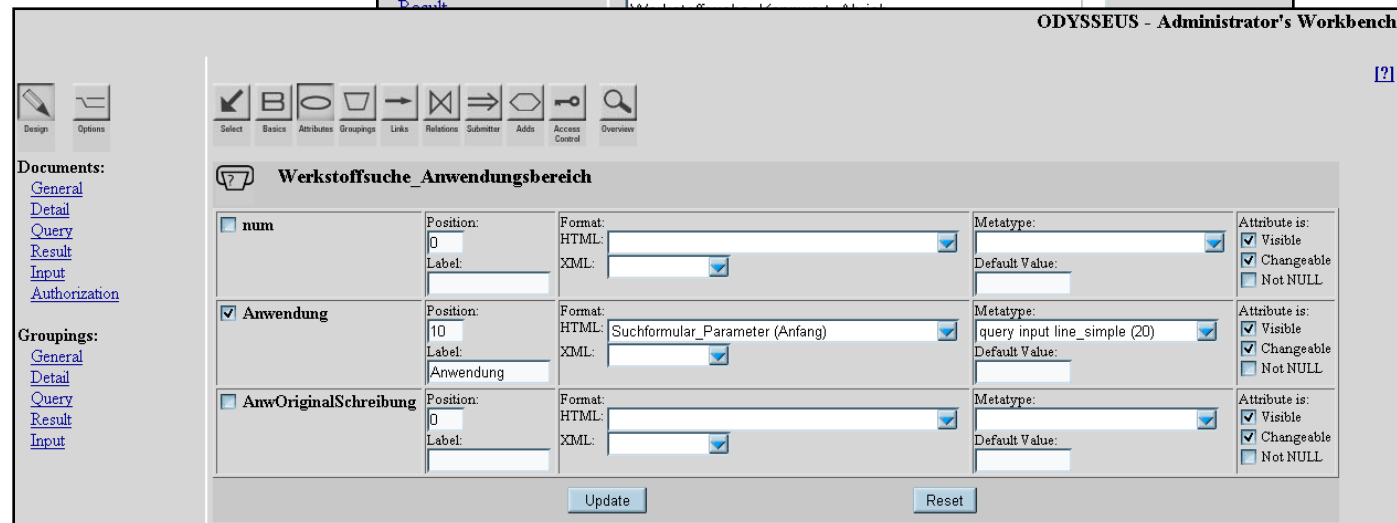
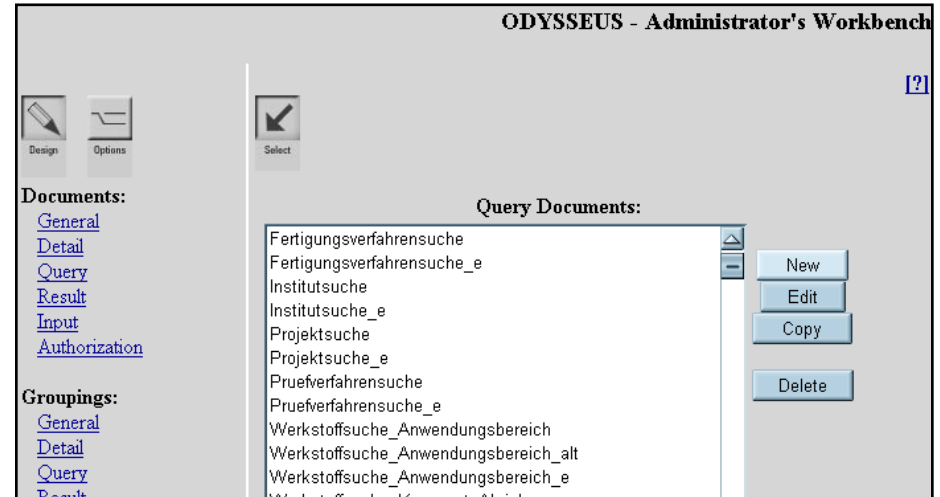


The interface displays several search mechanisms:

- Form-based Search:** A table with columns 'Kriterium' and 'Suchbegriff' for searching by Institution, Autoren, Titel, Projekt, and Programm. Below it is a 'Kennwertsuche: Dichte' (Keyword Search: Density) form with input fields for 'von' and 'bis' followed by 'kg/dm³', a checkbox for 'Bei Dezimalzahlen Punkt statt Komma!', and a 'Suchen' button.
- Property Requirement Table:** A table with columns 'Eigenschaft' and 'Anforderung'. It lists properties like Festigkeit (Strength), Hochtemperaturfestigkeit (High Temp. Strength), Härte (Verschleißwiderstand) (Hardness), and Bruchsicherheit (Fracture Resistance), each with three checkboxes for 'niedrig', 'mittel', and 'hoch', and an 'Info' link.
- Tree-based Navigation:** A 'Sachgebiets-Hierarchie' (Subject Area Hierarchy) tree showing a structure of goals, traffic demand, infrastructure, system organization, traffic flow control, and planning procedures.
- Material Search:** A 'Werkstoffsuche mittels Bezeichnung, Norm oder Gruppe' (Material Search by Name, Standard, or Group) form with a dropdown menu for material groups. The dropdown is open, showing options like Elastomer, Glas, Keramik, Kunststoff, Langfaser-Verbundwerkstoff, Metall Eisenbasis, Metall Kupferbasis, Metall Leichtmetalle, and Metall Nickelbasis. A 'Suchen' button is next to the input field.

Modelling Tool

- Modular design
- User-defined layout elements
 - down to HTML/XML tags



Benefits and disadvantages of WCMS

Advantages:

- Low cost (many free systems)
- Rapid prototyping & deployment
 - for small installations
- Plugin / Add-on extensibility
- Personalisation, role-based access control, workflow control
- Web-based administration & maintenance
- Flexible target formats from one source

Disadvantages:

- Total costs of ownership (TCO)
 - May require training for efficient use, dedicated hardware maintenance or licensing costs (training for upgrades may also be needed)
 - If web provided as a service, forces to its continuous update
- Performance
 - Larger installations can incur performance issues due to under optimization (DBMS) or inadequate hardware capacity (peak workload, large data files)

WebApp Attributes—I

■ Network intensiveness

- Served and accessed over the network
- diverse community of clients (see browsers later on)

test use cases?

■ Concurrency

- large number of users may access at same time
- patterns of usage vary greatly

■ Unpredictable load

- number of users may vary by orders of magnitude from day to day

■ Performance

- If user must wait too long may go elsewhere
- (due to access, server-side processing, client-side formatting and display, ...)

WebApp Attributes—II

■ Availability

- 100 percent availability unreasonable
- Yet users often demand “24/7/365” access

■ Data driven

- primary function of many WebApps: use hypermedia to present text, graphics, audio, video content
- Document Management System (DMS), Content Management System (CMS), Web Content Management System (WCMS)

■ Content sensitive

- up-to date, comprehensive, customer-oriented, ...

■ Aesthetics

- As critical as technical design

WebApp Attributes—III

- **Immediacy**
 - time to market a few days or weeks
 - sophisticated Web pages within few hours using modern tools
- **Continuous evolution**
 - conventional software: evolves over planned, chronologically-spaced releases
 - Web applications: evolve continuously
- **Security**
 - protect sensitive content + provide secure transmission
 - HTTPS, SSL, ...

Testing WebApps

- **Deceptively easy-looking** – "we just see that it all works fine"
- Check, among others (client-side; what about server-side?):
 - Dangling links – systematically only with tool (eg, wget)
 - Plug-ins (Flash, ...) UI components (applets, Active X, ...) Security
 - Performance – load times on DSL, ISDN, modem; concurrent access stress test
 - Proper reaction on error situations (illegal user input, system failure, ...)

■ Browsers...

Stats can be biased,
but provide a good basis

Usage share of desktop browsers for March 2013

Source	Chrome	Internet Explorer	Firefox	Safari	Opera	Other
StatCounter	38.07%	29.30%	20.87%	8.50%	1.17%	2.09%
Wikimedia	44.06%	22.08%	18.17%	3.24%	3.38%	9.07 %
W3Counter	30.30%	24.60%	19.30%	16.30%	2.30%	7.20%
NetApplications	16.45%	55.83%	20.21%	5.31%	1.74%	0.20%
Clicky	35.13%	33.38%	21.18%	8.92%	1.15%	n/a%

source: http://en.wikipedia.org/wiki/Usage_share_of_web_browsers

Selenium: browser automation

- Selenium automates browsers, that's it...
well, it also enables content verification
 - <http://docs.seleniumhq.org/>
- Selenium IDE: Firefox add-on for record-and-playback of interactions
 - bug reproduction scripts
 - scripts for automation-aided exploratory testing
- Selenium WebDriver: language specific bindings to drive a browser
 - browser-based regression automation
 - distribute scripts across many environments

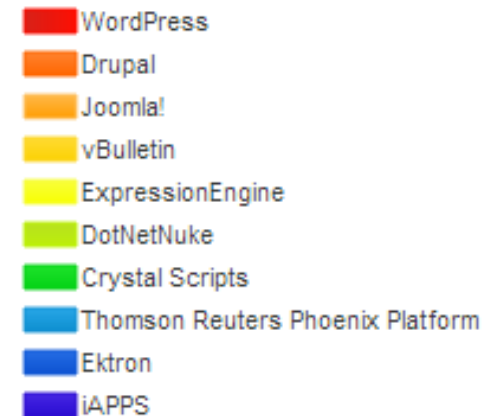
Which Open-Source WCMS?

Torge Schmidt, IRC-IT

- Free (See www.opensourcecms.com) / paid commercial / hosted
- IRC-IT has evaluated ~15 systems, here the creme:
 - MediaWiki
 - TYPO3
 - Mambo
 - Drupal
 - Xaraya
 - Xoops
 - Tiki-Wiki



CMS Distribution in Top 100,000 Sites



source: <http://trends.builtwith.com/cms>
April 2013