



Tool-supported Evolutionary Web Development: Rethinking Traditional Modeling Principles

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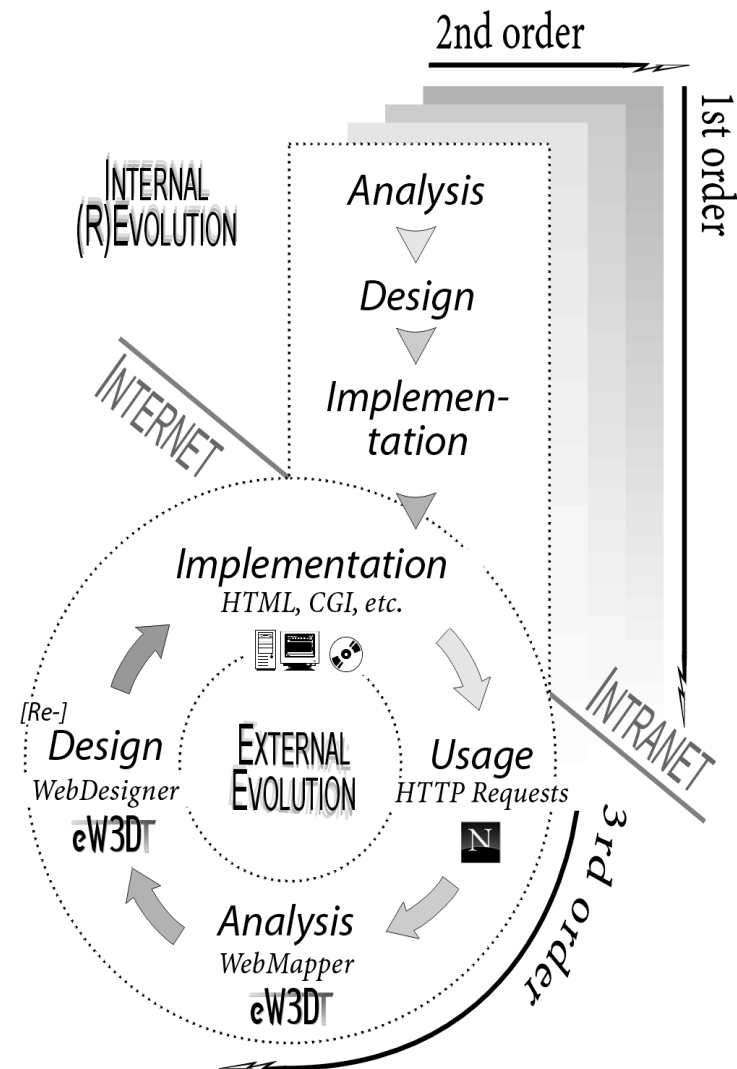
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Development Process

(<http://webdev.wu-wien.ac.at/>)

- **Internal Evolution**
 - Product Innovation (1st order)
 - Process Innovation (2nd order)
- **External Evolution**
 - Business Ecosystem (3rd order)



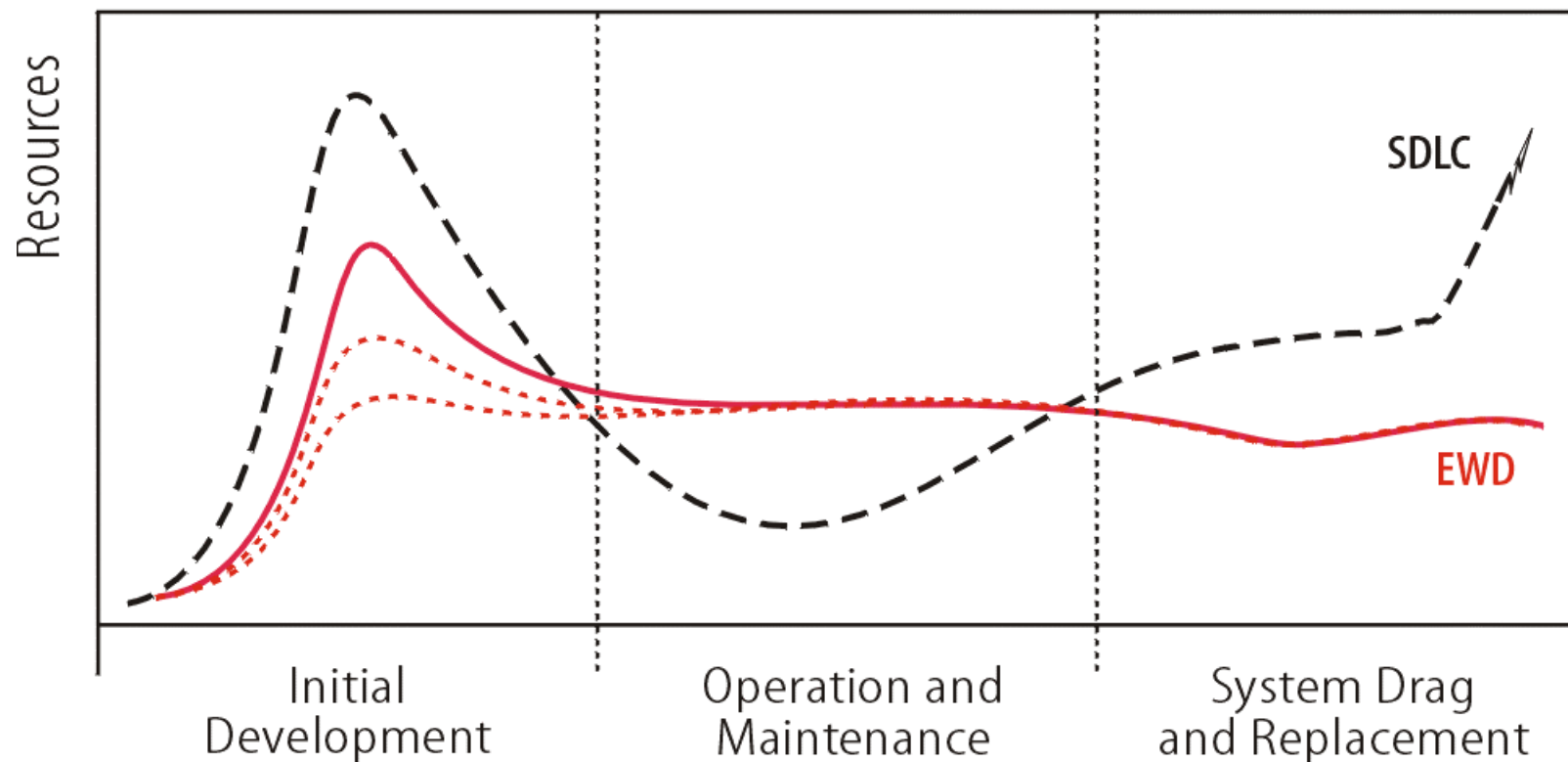
Business Ecosystem

... “an **economic community supported by a foundation of interacting organizations and individuals** - the organisms of the business world. This economic community produces goods and services of value to customers, who themselves are members of the ecosystem. ... **Over time they co-evolve their capabilities and roles, and tend to align themselves with the direction set by one or more central companies**”.

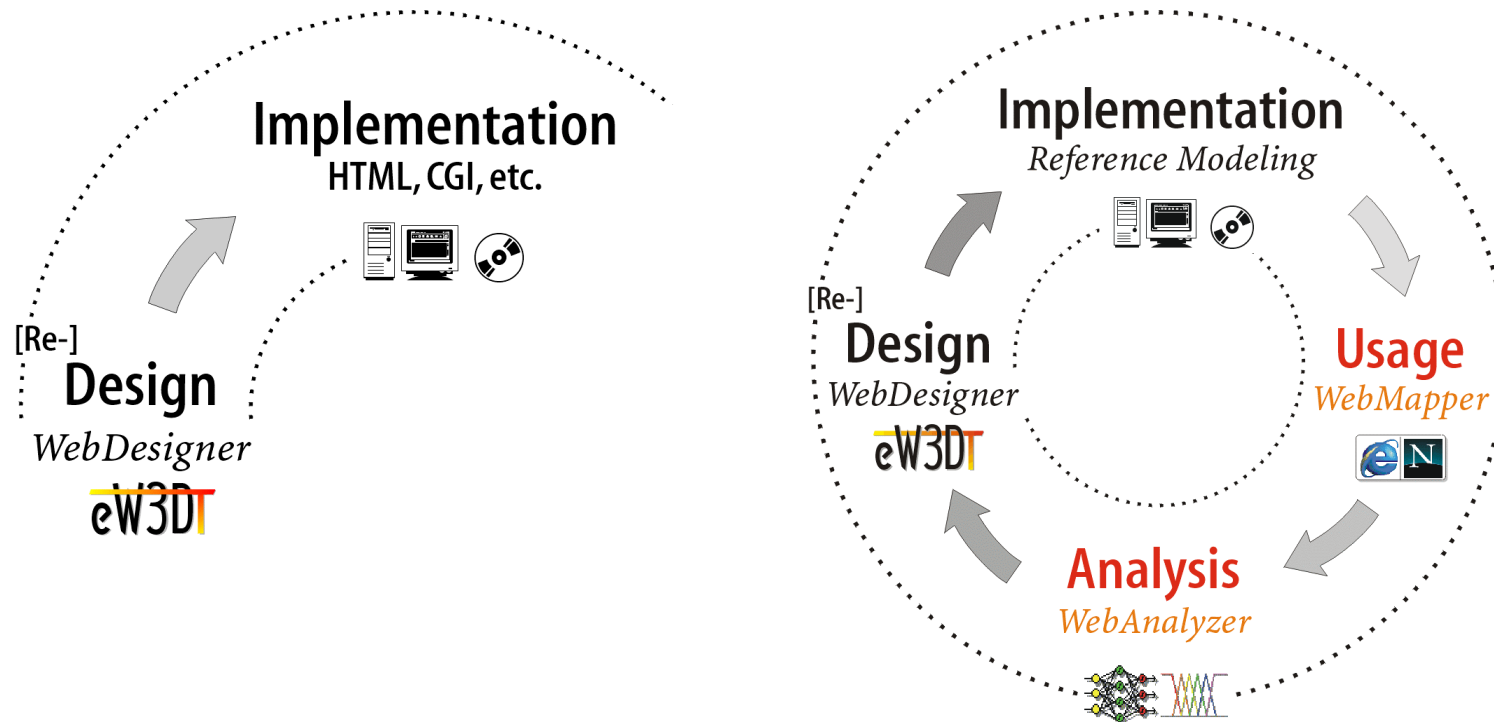
(Moore 1997)

Alternative Life Cycle Economies

EWD = Evolutionary Web Development
SDLC = Standard Systems Life-Cycle



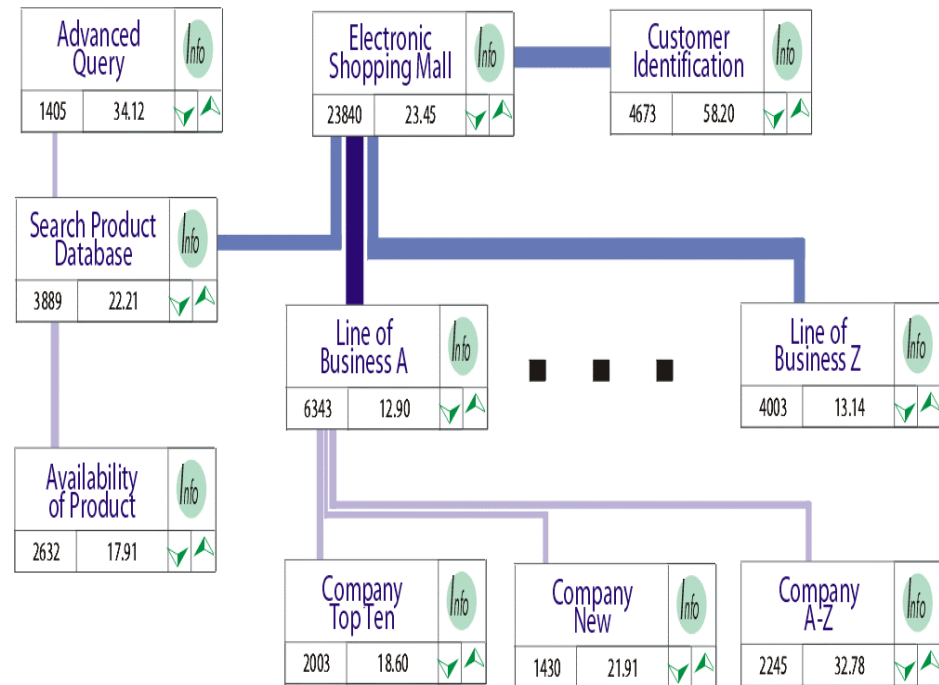
Static vs. Dynamic Web Development



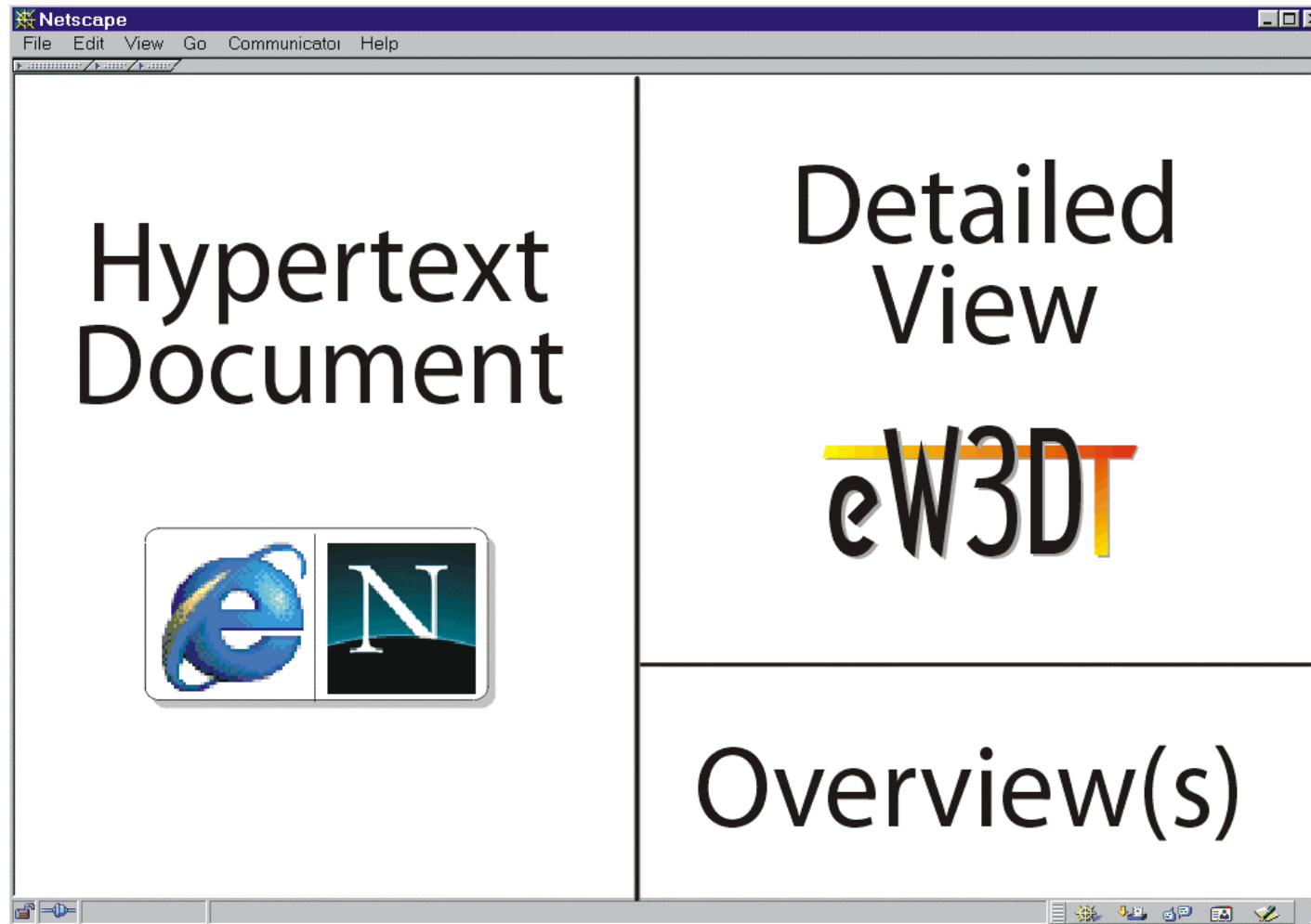
Customer Tracking



Web
Mapper



Tightly-Coupled Views (Conceptual)



Tightly-Coupled Views (Compaq)

The screenshot shows a Netscape browser window displaying the Compaq website. The website layout includes a header with the Compaq logo and navigation links, a main content area with a 'Product Showroom' section, and a footer with search and navigation options. A navigation diagram is overlaid on the right side of the browser window, illustrating the hierarchical structure of the website's views.

The navigation diagram shows a central 'P PRODUCT SHOW ROOM' view (3.0 MKT IS) which is tightly coupled to three main product categories: 'NEW PRODUCT EXPRESS' (3.1 MKT IS), 'NEWSFLASH' (3.1 MKT IS), and 'NEWS <X>' (4.0 MKT IS). The 'NEW PRODUCT EXPRESS' view is further coupled to 'NEW P PRODUCT <X>' (4.0 MKT IS). The 'NEWSFLASH' view is coupled to 'NEWS <X>' (4.0 MKT IS). The 'NEWS <X>' view is coupled to 'DESKTOPS [POWER]' (4.0 MKT IS), 'NOTEBOOKS [PORTABILITY]' (4.0 MKT IS), and 'MONITORS [VIEWING]' (4.0 MKT IS). The 'DESKTOPS [POWER]' view is coupled to 'COMPAQ CLASSICS' (4.0 MKT IS). The 'NOTEBOOKS [PORTABILITY]' view is coupled to 'HANDHELD'S [C SERIES 2015c]' (4.0 MKT IS). The 'MONITORS [VIEWING]' view is coupled to 'PRINTERS [PRODUCTIVITY]' (4.0 MKT IS). The diagram also shows a 'BUILT FOR YOU' view (4.0 MKT IS) which is coupled to the 'NEW PRODUCT EXPRESS' and 'NEWSFLASH' views.

The website content includes a 'Product Showroom' section with a navigation menu on the left (Product Showroom, Online Store, Buyer's Guide, Service & Support, My Presario) and a search bar at the bottom. The search bar contains the text 'Product Express' and a 'GO' button. The footer includes links for 'HOME', 'search', 'products', 'service', 'worldwide', and the 'COMPAQ' logo.

Methodology

A Select Business Sector(s)

- *Automotive*
- *Finance (Banking and Insurance)*
- *Information Technology*
- *Media and Entertainment*
- *Non-Profit Organizations*
- *Retailing*
- *Telecoms and Utilities*
- *Tourism, Travel, and Transport*
- *Pharmaceuticals*

B Data Gathering

- *Sample Specification*
- *Site Mirror (HTTrack)*
- *Data Archive (CD-ROM)*

C Data Extraction

- *Attribute Definition*
- *Structural Parameters*
(WebAnalyzer; Perl Scripts)
- *Textual Parameters*
(WordSmith Tool Set)

D Preprocessing

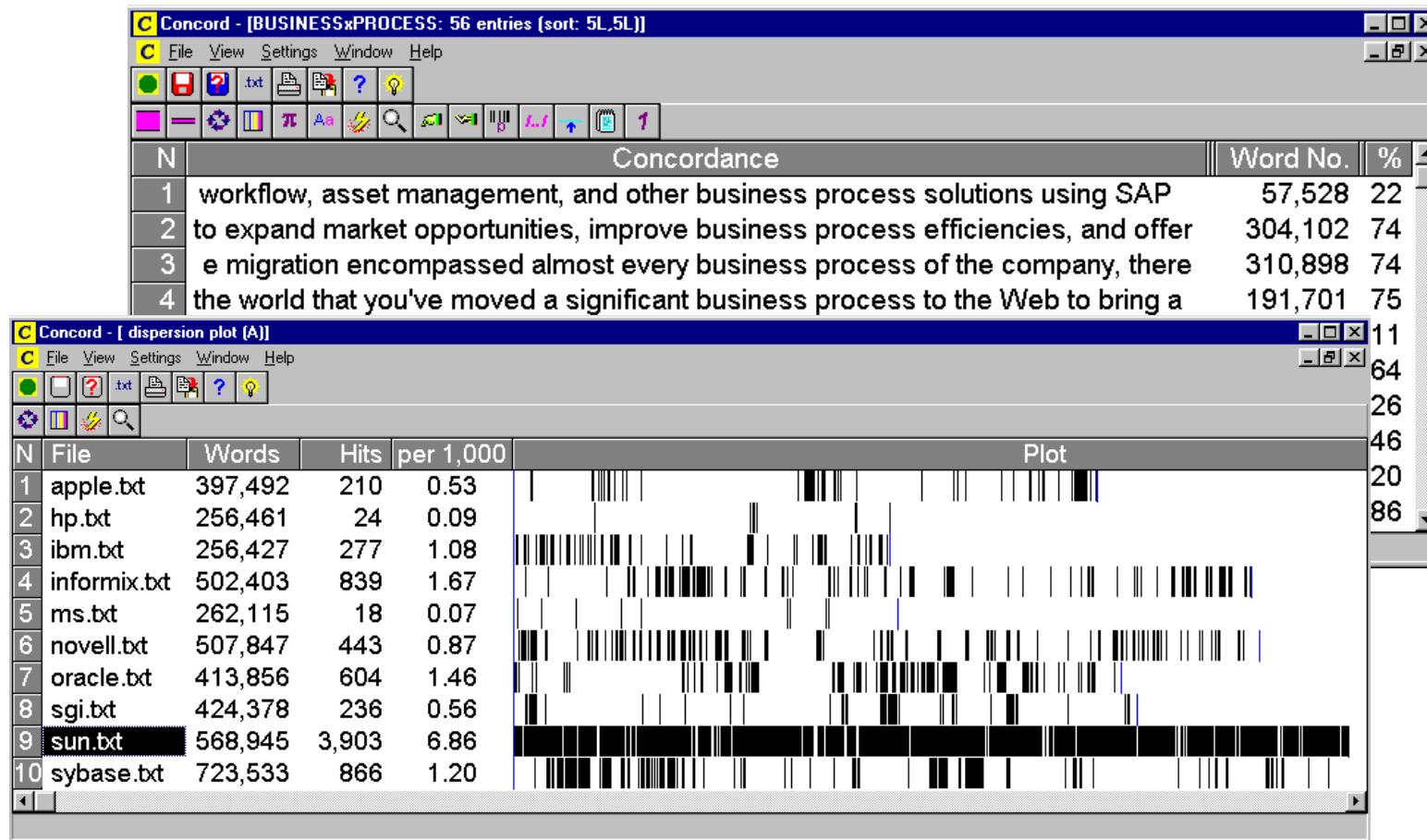
E Application

- *Snapshot Analysis (static)*
- *Logitudinal Analysis (dynamic)*
- *Comparative Analysis*
- *Test of Specific Hypotheses*

Structural Parameters

Criteria	Variables	Criteria	Variables
Content	# Documents [total]	Navigation	# Frames [total]
	Kilobytes downloaded [total text only]		# Internal Links [total distinct broken]
	# File Types [distinct extensions]		# External Links [total distinct]
	# Images [total distinct]		# Anchors [total distinct]
Interactivity	# Forms [total distinct fields]		# Links to Anchors [within between documents]
	# Scripts [total]		# SSL Links [total distinct]
	# Java Applets [total distinct]	Textual	# Words [types / tokens / ratio]
	# MailTo-Links [total distinct]		Average Length [words sentences documents]

Concordances / Dispersion Plot



Conclusion

- The dynamic nature of electronic markets suggests an evolutionary approach to developing Web-based applications
- Different from (rapid) prototyping, there are no official releases at certain intervals
- The Web development cycle contains the phases (re-)design, implementation, usage and analysis
- Interactive visualization and analytical tools enable decision makers to actively participate in Web development