Information Services:
Customer Intelligence and Strategic Planning

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The Wind of Change ...

- ## Information Technique
  - *Information Market*
  - *Customer Perception*

- ## Company Conditions
  - *Budgetary Constraints*
  - *Input-Output-Orientation*

... Forces New Strategies

Strategic Planning ...

- Appropriate vs. Advanced Services
  - *Customer Relationship and Satisfaction*
  - *State of the Art (and Beyond?)*
  - *Skills and Resources of the Library*

- Expectations vs. Behaviour of Customers
  - *Traditional Views of Libraries*
  - *Internet-Oriented Everyday Life*
  - *Poor Information Competence*

 *... Entails Effective and Efficient Services*

The Customer's Point of View ...

- ## Public Surveys on
  - ### *Satisfaction with Established Services*
    - INFAS
    - LibQual+
  - ### *Preferred Services and Action Lines*
    - Conjoint-Analysis (DFG-Project, Bielefeld)
      - *Adaptive Conjoint-Analysis*
      - *Choice-Based Conjoint-Analysis*

- ## Measurement of Behaviour
  - ### *Data Warehouse*

... Must Be Accompanied by Expertise

Customer's Preferences ! ???

- Conjoint-Analysis with Respect to Searching
  - *Catalog, Articles, Meta-Search, Search Engine*

Search Facilities
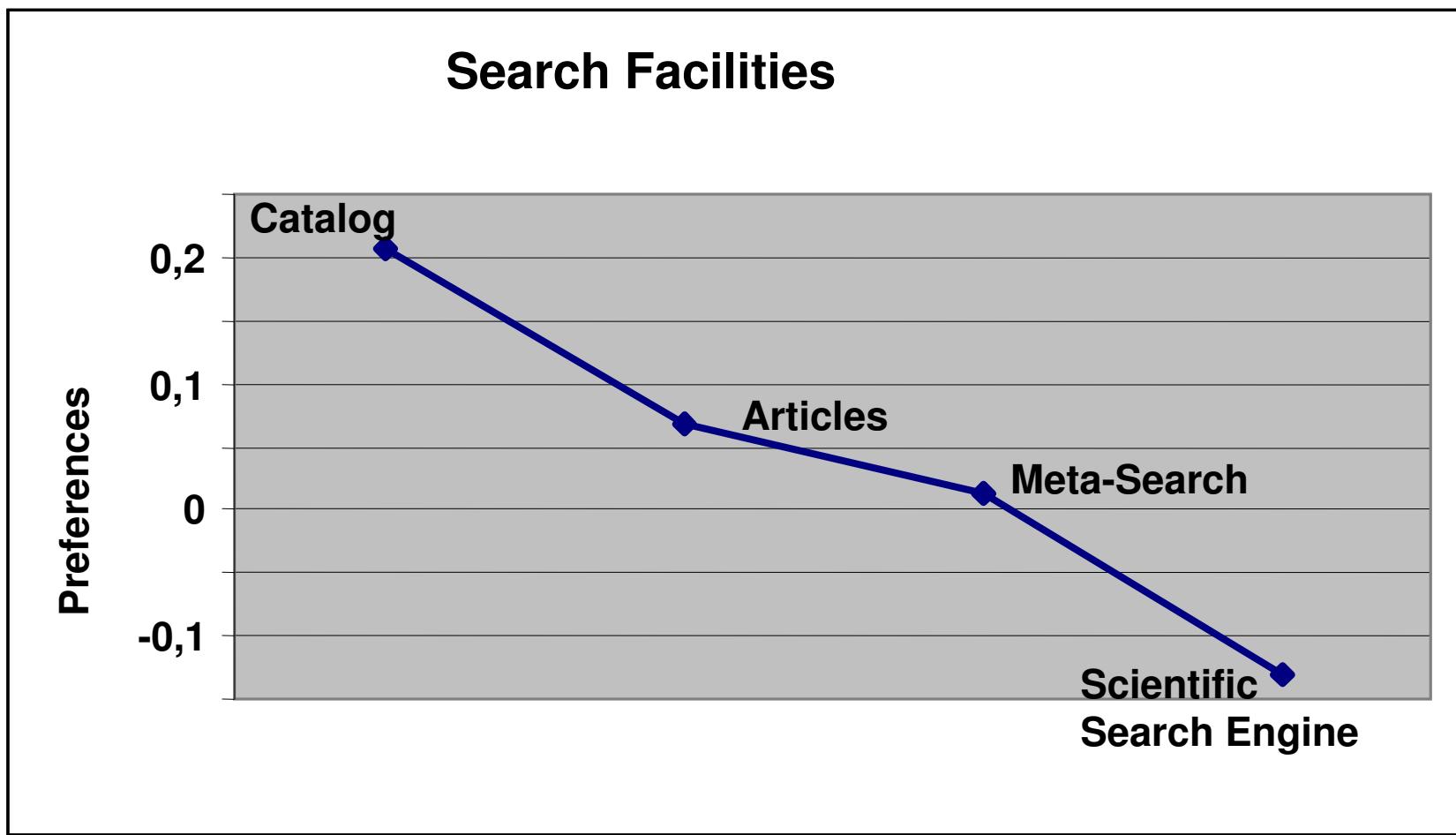
Effectivity of Services ...

- Mission Statement
  - *Guiding Principles*
  - *Address of Services*

- Catalog of Services
  - *Recognition, Transparency, and Reliability*
  - *Depending on Demands, Skills, and Resources*

- Service Level Agreements
  - *Measurements of Services*
  - *Reliability of Resources*

... Has to Be Accepted by all Parties

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Discussing Effectivity ...

- Generating Ideas of Services
  - *Screening the Environment*
  - *Expertise from Employees*
    - Matching with Expectations and Skills

- Finding Proper Services
  - *Staff Meetings, Steering Group*
  - *Working Groups, Editorial Group*
    - Description of 200 „Services" (or Routines)
    - Consolidation to Catalog of 50 Services

... Needs Involvement of Staff

Catalog of Services

- Content
  - *The (General) Library*
    - Scientific Literature
    - Comfortable Search
    - Customer Assistance
  - *My Library*
    - Personalized Portal/Services
    - Services on Demand
  - *A Place to Work ...*
    - Structure and Specialities
    - Research, Instruction, and Study
    - General Equipment

A Service Description

Produktname	Bücher, Zeitschriften, Artikel (inkl. Neuerscheinungen)	1.1.1.1
Produktgruppe	Die Bibliothek Sie finden bei uns Wissenschaftliche Literatur und mehr	1 1.1 1.1.1
Sie suchen (Ziele)	**Sie möchten sich einen Überblick verschaffen, ob und wo zu einem bestimmten Thema Literatur vorhanden ist.**	
Wir bieten (Was und wie)	In unseren fachübergreifenden Datenbanken können Sie nach Büchern, Zeitschriftentiteln, Zeitschriftenaufsätzen und anderen Veröffentlichungen suchen, die in der Universitätsbibliothek Bielefeld vorhanden, über Fernleihe aus anderen Bibliotheken bestellbar oder frei im Internet zugänglich sind.	
Zielgruppen	⊠ Alle ☐ Studienanfänger (1.-3. Semester) ☐ Fortgeschrittene Studierende inkl. Examenskandidaten ☐ Tutoren / Hilfskräfte ☐ Wissenschaftler ☐ Sonstige Hochschulangehörige ☐ Schüler ☐ Externe	
Angebote	▪ Bibliothekskatalog: Über 2 Mio. Bücher, Zeitschriftentitel und Publikationen aus Hochschulen und anderen wissenschaftlichen Einrichtungen, die entweder in der Bibliothek vor Ort oder online im Internet zugänglich sind. ▪ Aufsatzdatenbank JADE: Über 40 Mio. Zeitschriftenaufsätze. Direkte Anzeige der Zugriffsmöglichkeiten (gedruckt in der Bibliothek, online, per Fernleihbestellung). ▪ JASON (Fernleihe für Zeitschriftenaufsätze / Suche nach Zeitschriftentiteln): Suche nach Zeitschriftentiteln mit anschließender Bestellmöglichkeit eines Aufsatzes aus einer Zeitschrift. Nutzung ist sinnvoll, wenn eine Recherche im Bibliothekskatalog und in JADE keine Treffer erbringt. ▪ EZB (Elektronische Zeitschriftenbibliothek): Datenbank für online erscheinende Zeitschriften mit Anzeige der Abrufmöglichkeiten. Die Titel sind auch über den Bibliothekskatalog zu finden. ▪ Suche nach Neuerwerbungen: Liste der Neuzugänge der letzten 4 Wochen	

Efficiency of Performance ...

- Analysis and Optimisation
  - _Transactions and Workflow_
    - Organisational Development
    - Personnel Development

- Controlling
  - _Customer Satisfaction_
  - _Performance Indicators_
    - Reengineering of Business
    - Readjustment of Objectives

... Must Be Proofed Again and Again

Discussing Efficiency ...

- Identifying Fields of Activities
  - *Assistance of Customers*
  - *Performance Indicators*
  - *Data Processing as a Foundation of Most Services*
- Course of Discussion
  - *Weak-Point Analysis*
  - *Necessity of Transactions and Workflow so far*
  - *Interdependence of Quality and Resources*

... Must be Based on

Confidence of Staff and

Acceptance of Customers

Customer intelligence and DS

What does **"customer intelligence"** mean?

"CI aims at gaining a comprehensive understanding of customers by means of intelligent tools, which enable a more pointed customer contact and a higher degree of customer loyalty."

(IBM 2005)

Questions to be answered:

➢ Who are the customers?

➢ What needs do the customers have?

➢ How do they use the library services?

➢ How loyal are the customers?

➢ Who are the "valuable" customers?
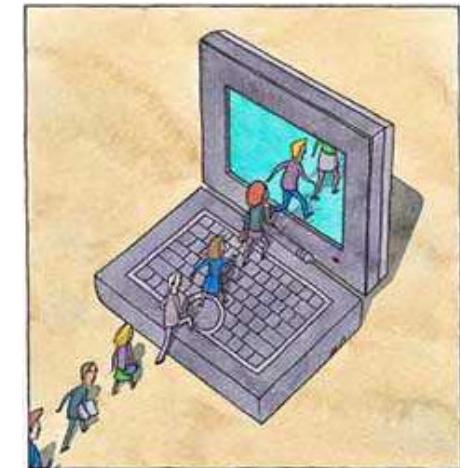
(Tomczak/Christofolini 2002; Janal 2000)

Customer intelligence and DS

CI and CRM:

Forrester Research (2005): "… 98 % of the marketers rate customer analysis and analytics as the most important database element in producing successful results."

The problem:

➢ No unanimous understanding of CI in science

➢ No clearly defined set of CI methods

But: Consensus regarding the use of data warehouse and data mining techniques in CI discussions

Customer intelligence and DS

The knowledge source:

1. Search and orientation
2. "Purchase"
3. Utilization and satisfaction
4. "Repeat purchase"
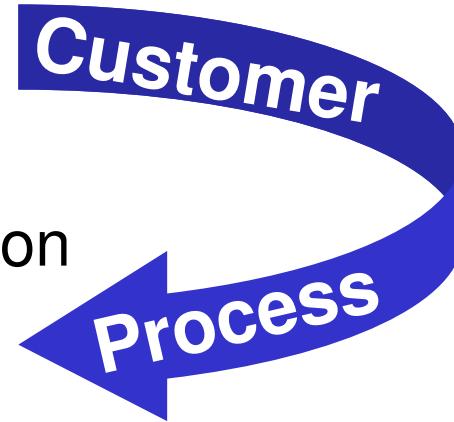
Customer

Process

Resulting tasks:

➢ Exact process definition

➢ Location and evaluation of customer information

➢ Method selection and application

Customer intelligence and DS

Data warehousing in libraries:

(LiMIS =
**Library Management
Information System)**
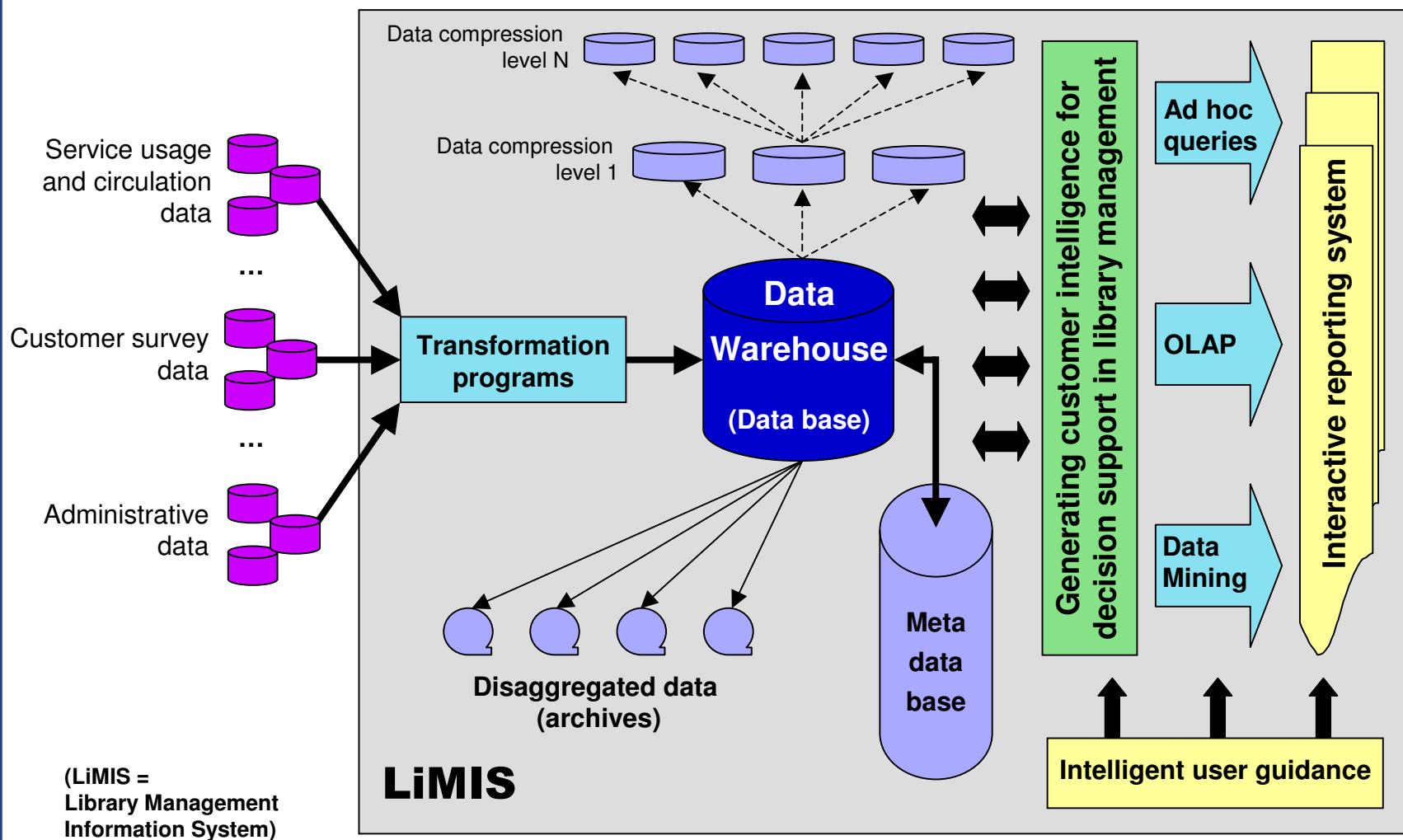
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OLAP of library data:

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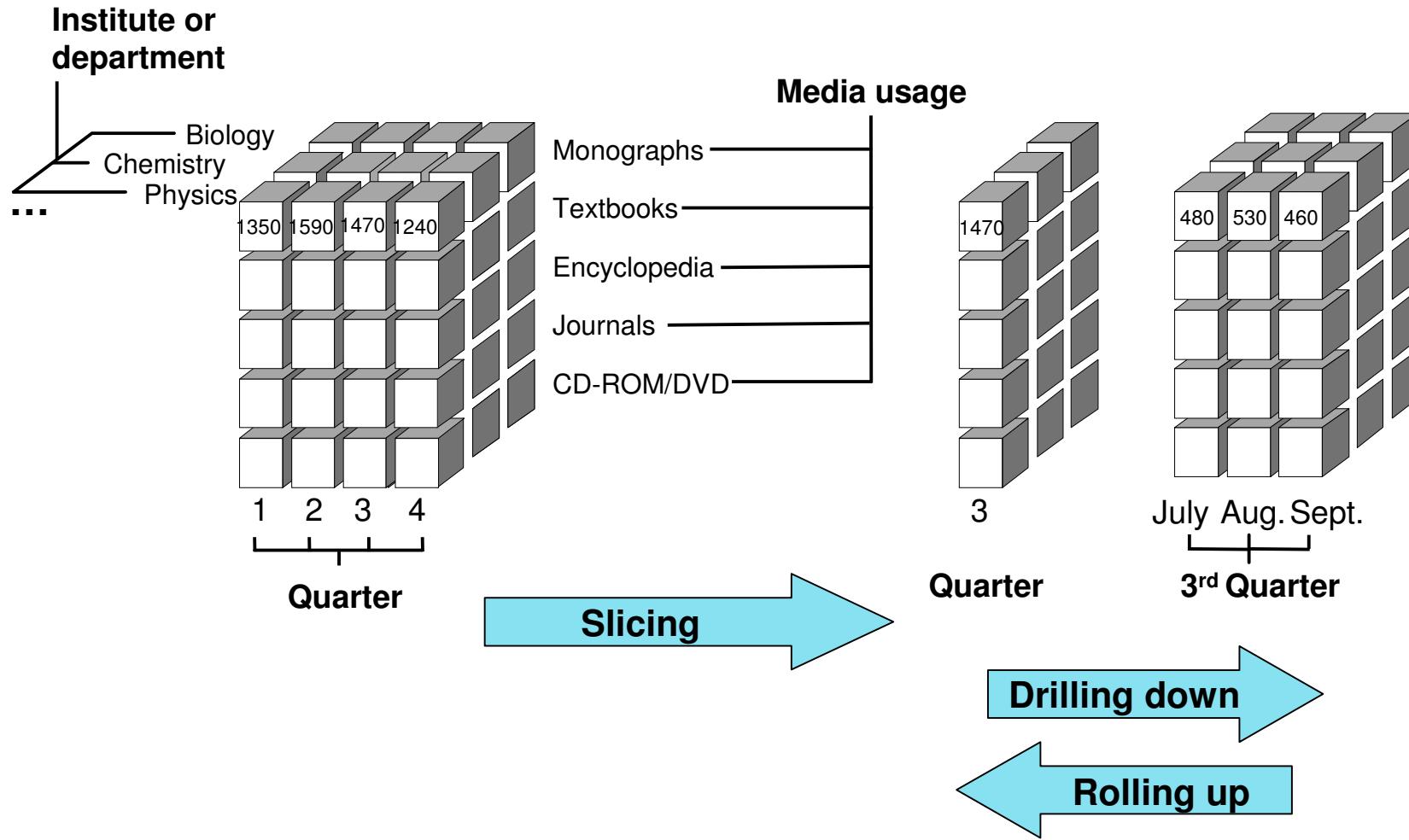
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CI development process:

1. Identifying the relevant data structures
   ? data heterogeneity

2. Determining the practical demands to LiMIS
   ? information type and aggregation level

3. Implementing the data warehouse
   ? separation of operative systems and DSS
   ? definition of data syntax and semantics

4. … the transformation interface
   **?** adequate level of automation

Customer intelligence and DS

5. … an OLAP and data mining front-end
    ? process model (goal driven vs. data driven)

6. … a data mining "toolbox"
    ? selection of adequate fields and methods

7. Design of survey and observation techniques
    ? dealing with qualitative data / latent information

8. Implementing a reporting system
    ? hierarchy of relevance
    ? concepts of interestingness

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Conclusion:
Meeting the CI challenge in libraries
is much more than investing
in modern IT infrastructure.
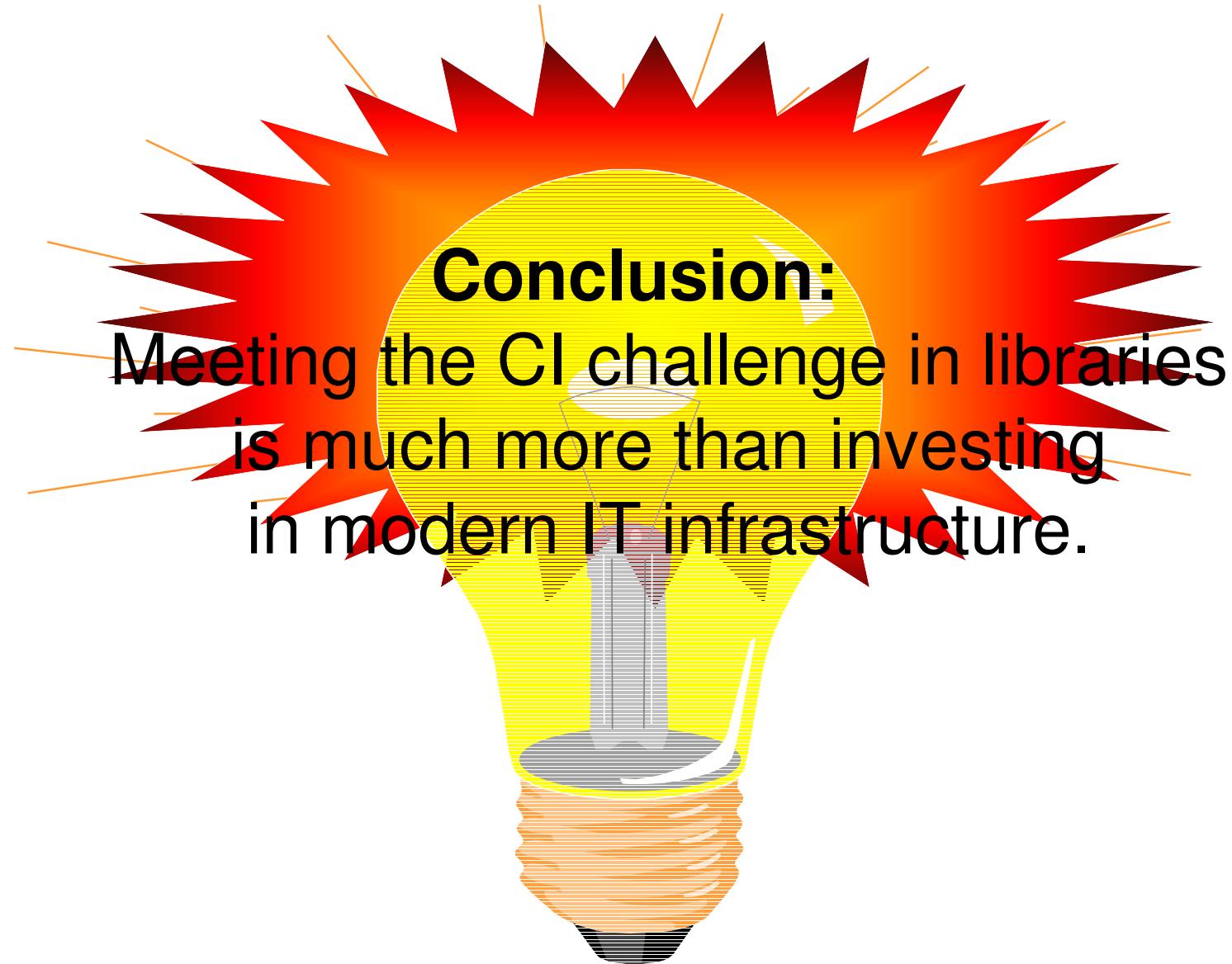
Data warehousing success

Study by Ariyachandra/Watson 2006:

Item 6: "Your data warehouse provides all the data needed by users and applications."

Item 20: "Users can access the data more easily and quickly because of the data warehouse."

Measure	Number of items	Range of ratings or values
Information quality	9	4.19 – 5.63 ($\varnothing$ 5.04)
System quality	9	5.04 – 5.90 ($\varnothing$ 5.39)
Individual impacts	5	5.03 – 5.91 ($\varnothing$ 5.59)
Organizational impacts	6	4.53 – 5.50 ($\varnothing$ 5.19)
Development costs	(3 arch.)	$ 1.4 – 2.4 million
Development time	(3 arch.)	8.8 – 11.4 months

(N = 454)

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DS with primary data

Preference measurement in academic libraries:

	Expansion of printed objects						
	Expansion of digital objects						
	Online reading lists						
	Educational software						
	Radio-archive						
	E-books						

> ➤ ACA and CBC
>
> ➤ N ≥ 3 500 (academic library users)

(Decker/Hermelbracht 2005)

DS with primary data

➢ Evaluation of service concepts by means of averaged part-worth utilities

Chart: Part-worth utility (y-axis) vs. Services (ACA attribute levels) (x-axis)

- Expansion of printed objects: **0.263**
- Expansion of digital objects: **0.159**
- Online reading lists: **0.134**
- E-books: **-0.022**
- Educational software: **-0.147**
- Radio-archive: **-0.152**

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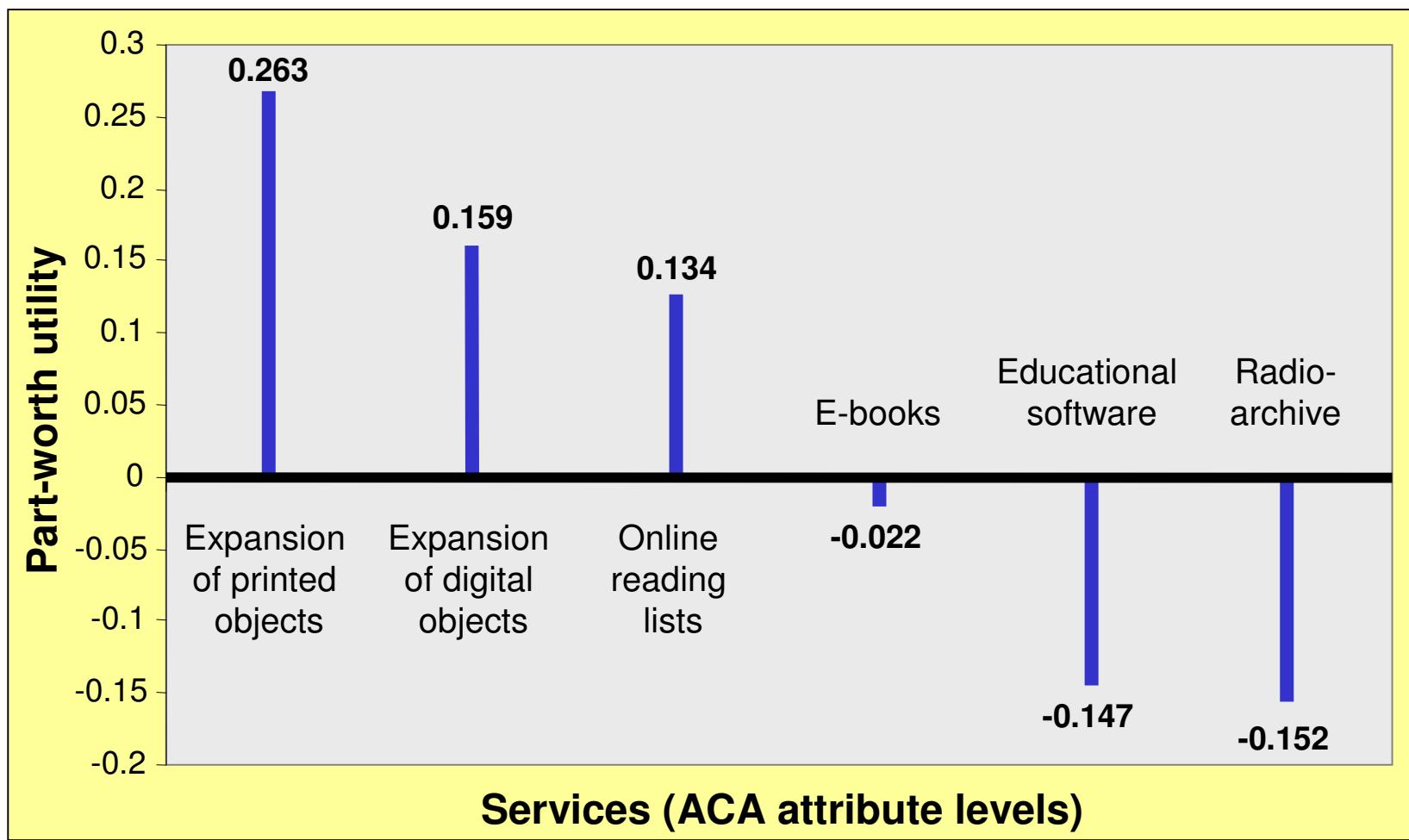
DS with primary data

Preference measurement in public libraries:
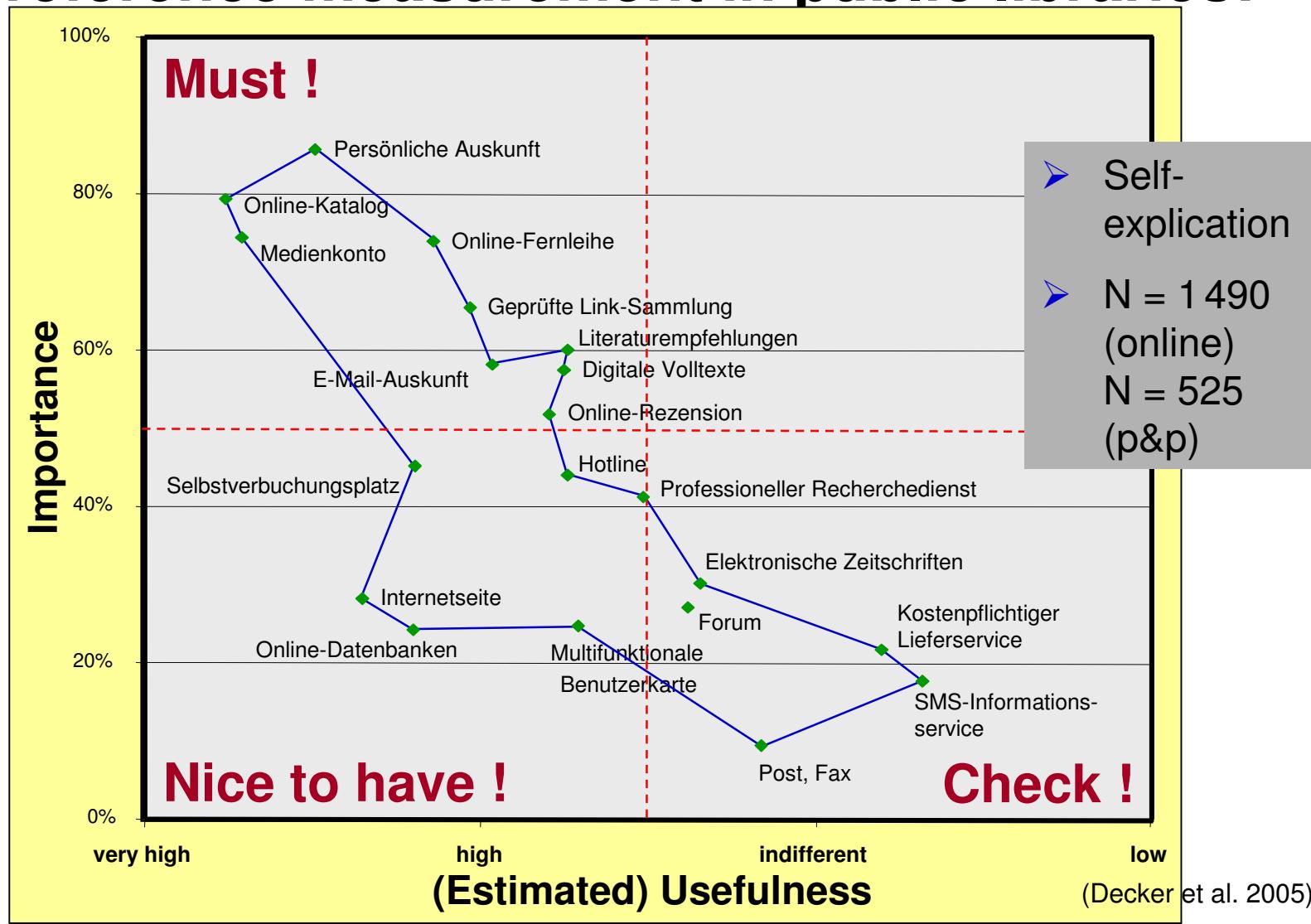
DS with secondary data

Library acquisition budget allocation:

➤ Circulation database mining with ID3

Department	Concentration	Connection	Budget [NTD]
Public communication	2.1175 (max.)	1.5175 (low)	44 469 **(min.)**
Industrial management	2.0299 (medium)	2.3211 (low)	61 453 (low)
Fiber engineering	2.0271 (medium)	3.2114 (medium)	80 779 (medium)
Environmental engineering	1.9923 (low)	6.3602 (max.)	149 001 **(max.)**

Premise: **The more a department makes use of its acquired materials in the present, the more budget it can get in the future.**

(Kao/Chang/Lin 2003)

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DS with secondary data

Pattern mining in media usage data:

➢ 3773 book profiles (34 items)
➢ Self-organizing neural network → 11 "prototypes"

Items (short forms of statements)	Prototype 1 (2655)	Prototype 2 (126)
Number of available copies	1.20	2.10
Number of pages	250	375
Last edition	1.12	2.25
Year of publication	1991	1994
Total number of lendings	0.89	5.25
Number of reservations	0.04	0.66
Number of biweekly lendings	0.13	5.19
Number of copies lent during the term	0.57	3.70

(Decker/Hermelbracht 2004)

Thank You, ... *and don't forget*

When the wind of change blows,

some build walls,
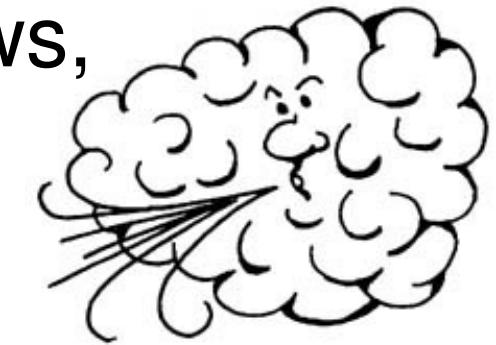
others windmills.

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