

Institute for Media  
and Communications Management



University of St.Gallen

# Fighting Knowledge Fatigue

The Role of Information Overload and  
Information Quality in KM Initiatives

Martin J. Eppler, Ph.D.

Vice Director

=mcm *institute*

University of St. Gallen

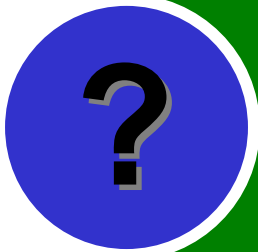
[martin.eppler@unisg.ch](mailto:martin.eppler@unisg.ch)

[www.knowledgemedia.org](http://www.knowledgemedia.org)

© =mcm *institute*

# Key Questions

---



- = What are some of the key problems and success factors of knowledge management initiatives?
- = Why is the notion of **information overload** crucial?
- = What are its symptoms, causes and countermeasures against it?
- = What is the role of **information quality** for KM programs?
- = What can you do about all this Monday morning?

# Knowledge Fatigue

---

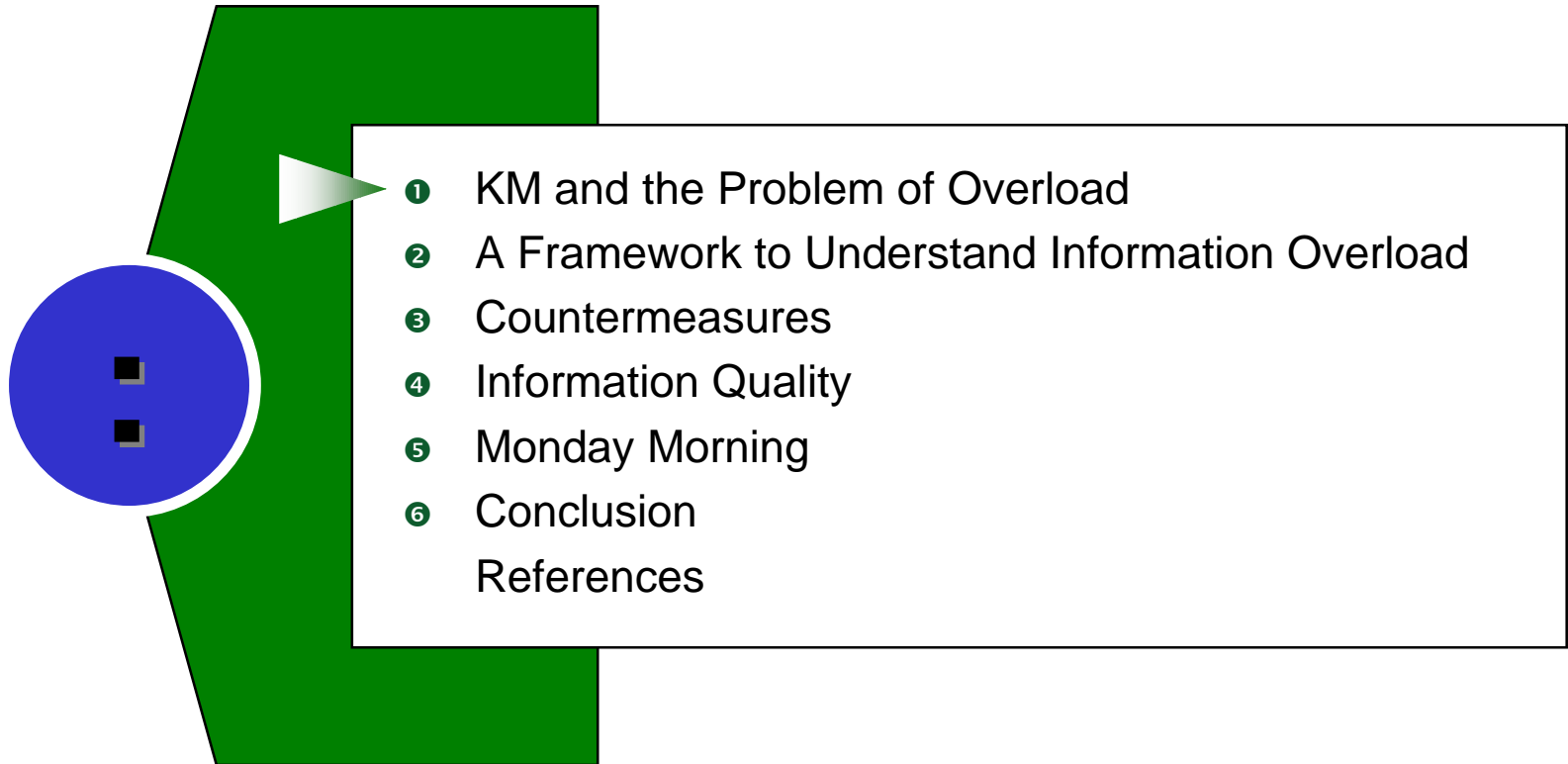
= The cognitive and motivational state where an employee is no longer able or willing to acquire new knowledge due to information overload or low information quality.



Source: Eppler (2002)

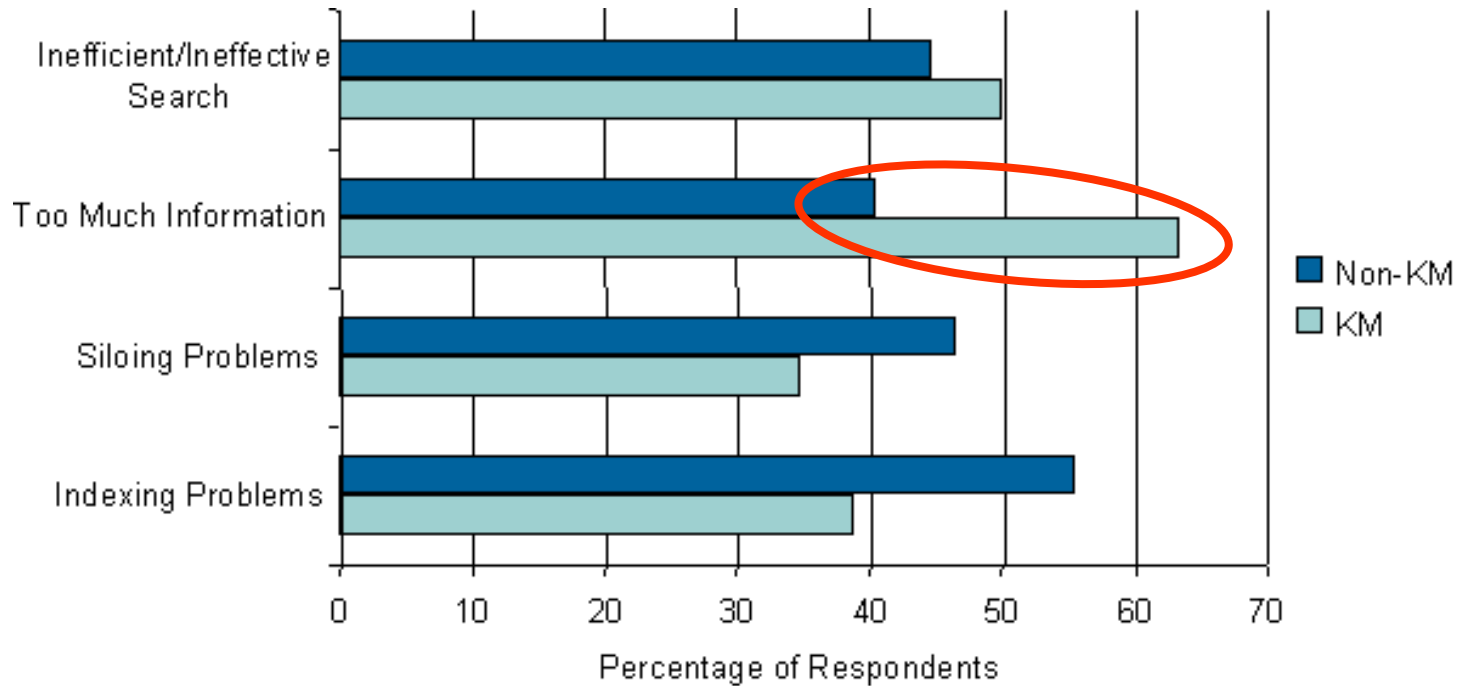
# Agenda

---



# Knowledge Management & Overload I

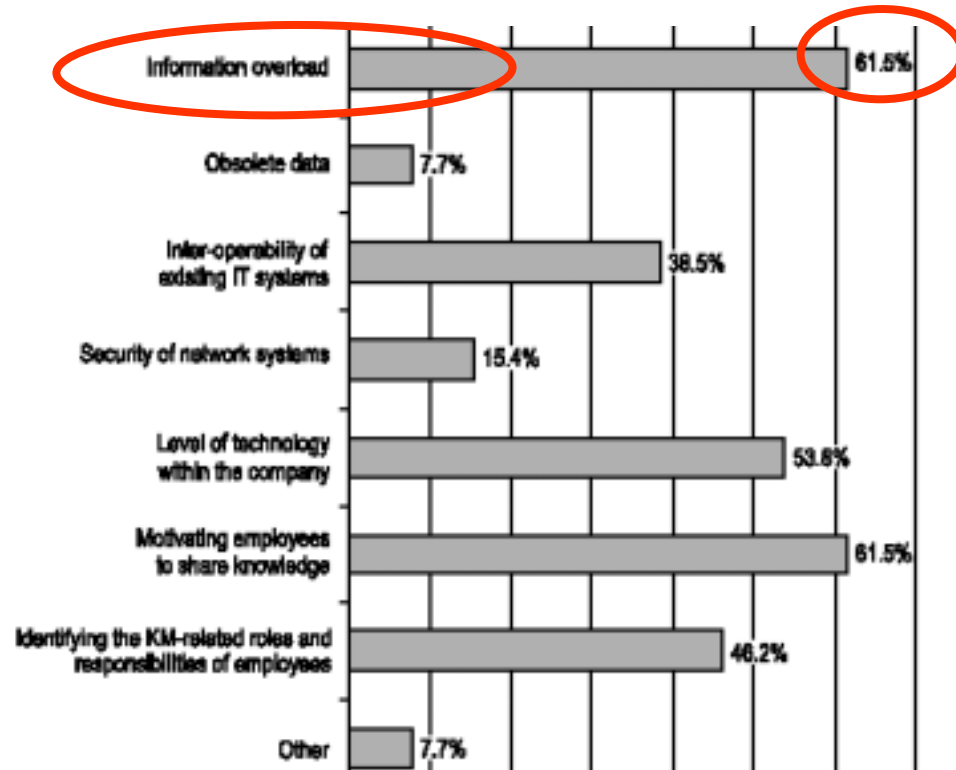
***KM programs lead to a higher perceived information overload.***



n = 316  
Source: Gartner (2001)

# Knowledge Management & Overload II

*Empirical evidence reveals overload as the dominant knowledge management project barrier.*



# Knowledge Management & Overload III

---

## *The KM focus on collection leads to knowledge glut.*

- = Nearly two-thirds (65%) of organizations with a KM program complained of information overload – the creation of a knowledge glut or an overwhelming collection of information for information's sake that can be difficult and painstaking to use.
- = 67 percent of respondents claimed they were suffering from information overload.
- = 56 percent and 50 percent respectively complained that employees duplicate processes and activities and have difficulty locating information.

Source: KPMG (2000)

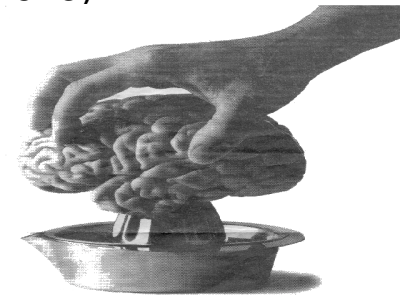
Methodology: "Knowledge Management Research Report 2000" surveyed 423 organizations across the U.K., mainland Europe, and the U.S. The enterprises reported at least \$300 million in revenue and were distributed across a number of industries including financial services, industrial products, consumer markets, technology, government, transportation, and others.

# Terms to describe Information Overload

---

*Too much information impedes effective action.*

- = Nerve Attenuation Syndrome (NAS)
- = Information flood
- = Knowledge Inertia
- = Information stress/burn-out
- = Attention Deficit Disorder (ADD)
- = Infobia
- = Information blackout
- = Information overkill
- = Cognitive overload (Vollmann, 1991)
- = Communication overload (Meier, 1963)
- = Paralysis by Analysis
- = Knowing-Doing Gap (Pfeffer & Sutton, 2000)
- = Sensory overload (Libowski, 1975)
- = Data smog (Shenk 1997)
- = Information anxiety (Wurman, 2000)



# Definition: Information Overload

*Perceived processing requirements vs. capacity determine overload.*

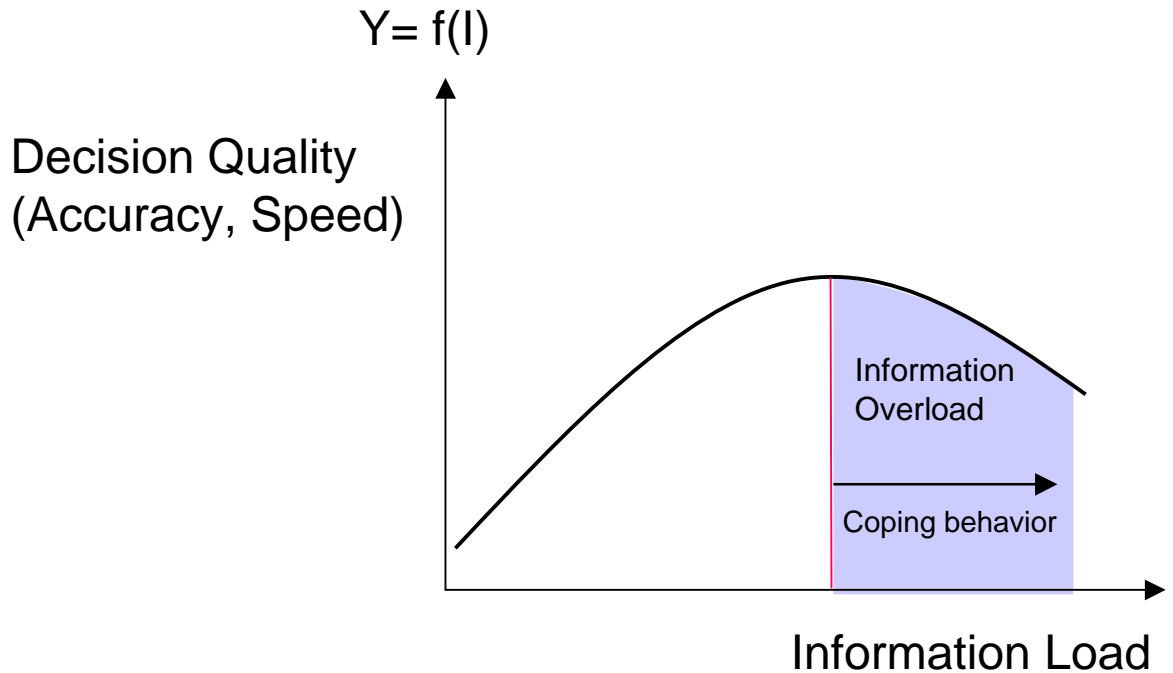
Information processing requirements  Information processing capacity

- ⇒ Inaccurate decisions
- ⇒ Process lags (paralysis by analysis)
- ⇒ Quality problems
- ⇒ Stress / reduced well-being
- ⇒ Knowing-Doing Gap (Pfeffer & Sutton, 2000)



# Overload as the Inverted U-Curve

*Human information processing is limited.*



A core problem for:

- = Consumers
- = Project Managers
- = Accountants
- = City people
- = Managers
- = Strategic Planners
- = Students

and:

- = Knowledge Managers

# Empirical Evidence: Gartner (2001)

---

## ***Overload is a significant problem that is not solved by KM programs.***

- = Nearly 90 percent of respondents said their enterprise's competitiveness was affected by problems handling information.
- = Respondents from consulting and government enterprises spend more time — about 60 percent of the time spent on all knowledge resources — on e-mail and personal networks than the average (i.e., about 50 percent).
- = Respondents from enterprises with knowledge management (KM) programs believe they get better support for all kinds of knowledge sources.
- = There is a widespread perception that personal networks (i.e., obtaining information from another person by phone, e-mail or in person) receive less support than they deserve, given their usefulness.

The survey received 316 responses: 81 from Brazil, 96 from Europe and 139 from the United States. Approximately 21 percent were technical or support staff, and the majority (70 percent) were managers, while 10 percent left their position unspecified.

---

# Empirical Evidence: Reuters (1997)

---

*The notion of overload is a widely recognized feeling.*

- = **61 % of managers believe information overload is present in their work place.**
- = **90 % of managers feel they cannot handle the quantity of information at some point.**
- = 80 % of managers believe this situation will get worse in the future.
- = **60 % believe the cost of gathering information outweighs its value (compared to 44% in 1996)**
- = 54 % worry about making poor decisions in spite of all the information at their disposal.

Methodology: 1000 confidential telephone interviews in October 1997 randomly amongst executives (42 % seniors) in Germany, UK, USA, Hong Kong, Singapore and Ireland.

# Further Empirical Evidence

---

*There is extensive evidence that overload is present in the workplace.*

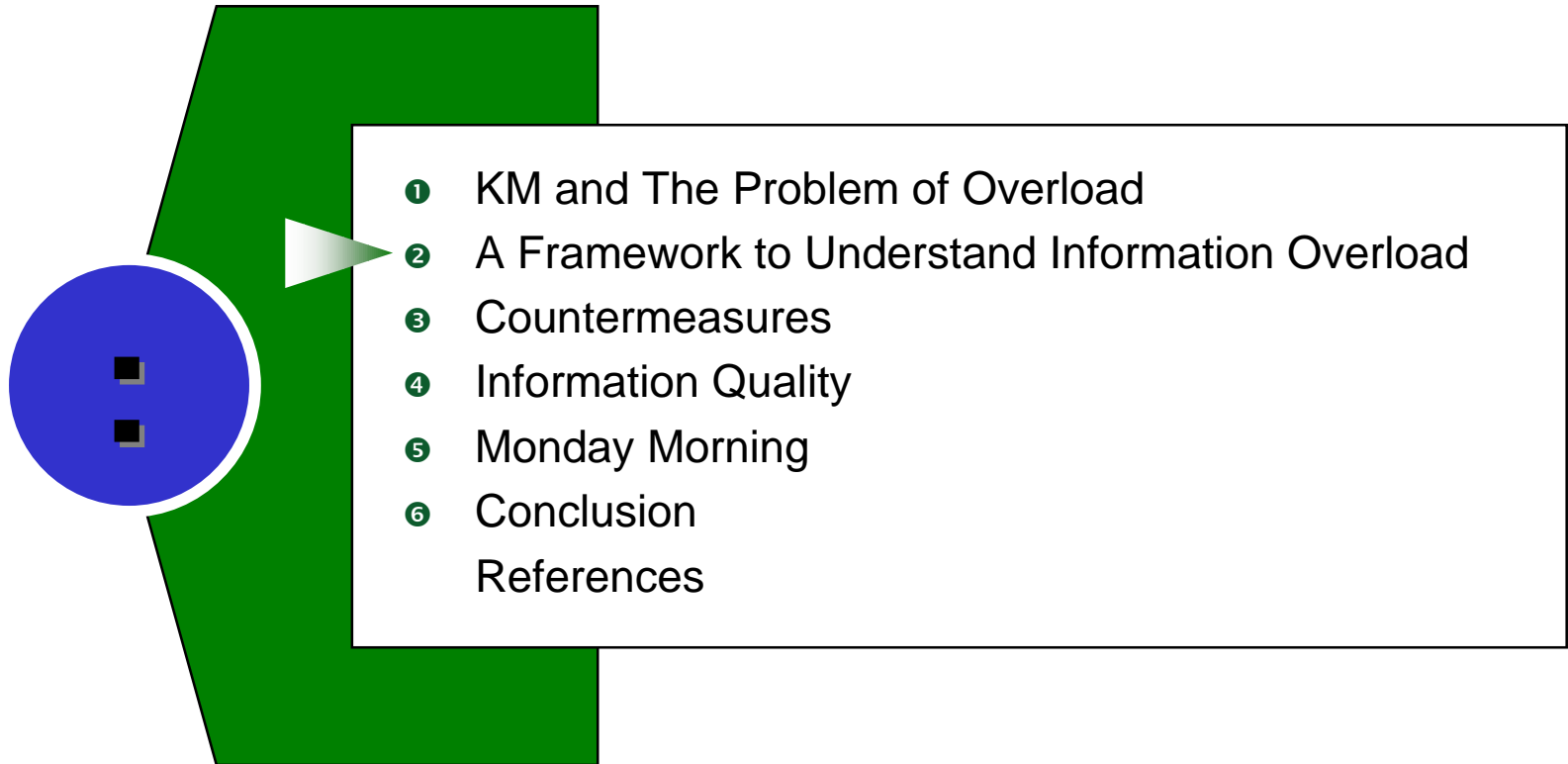
## Surveys:

- = Amacon, 1958: Presidents and Paperwork
- = Harvard 1988: Information Mosaic
- = Reuters 1996: Dying for Information
- = Gallup/Institute for the Future/SJU 1996: Managing Corporate Communications
- = Business Objects 1997: The Fact Gap
- = Deloitte & Touche 1997: IM Survey
- = Firefly/Reuters 1997: Glued to the Screen
- = Reuters 1998: Out of the Abyss
- = NetLibrary 1999: How Business Travelers Stay Connected
- = KPMG 2000 : Knowledge Management Report
- = Gartner 2001: Information Management Survey

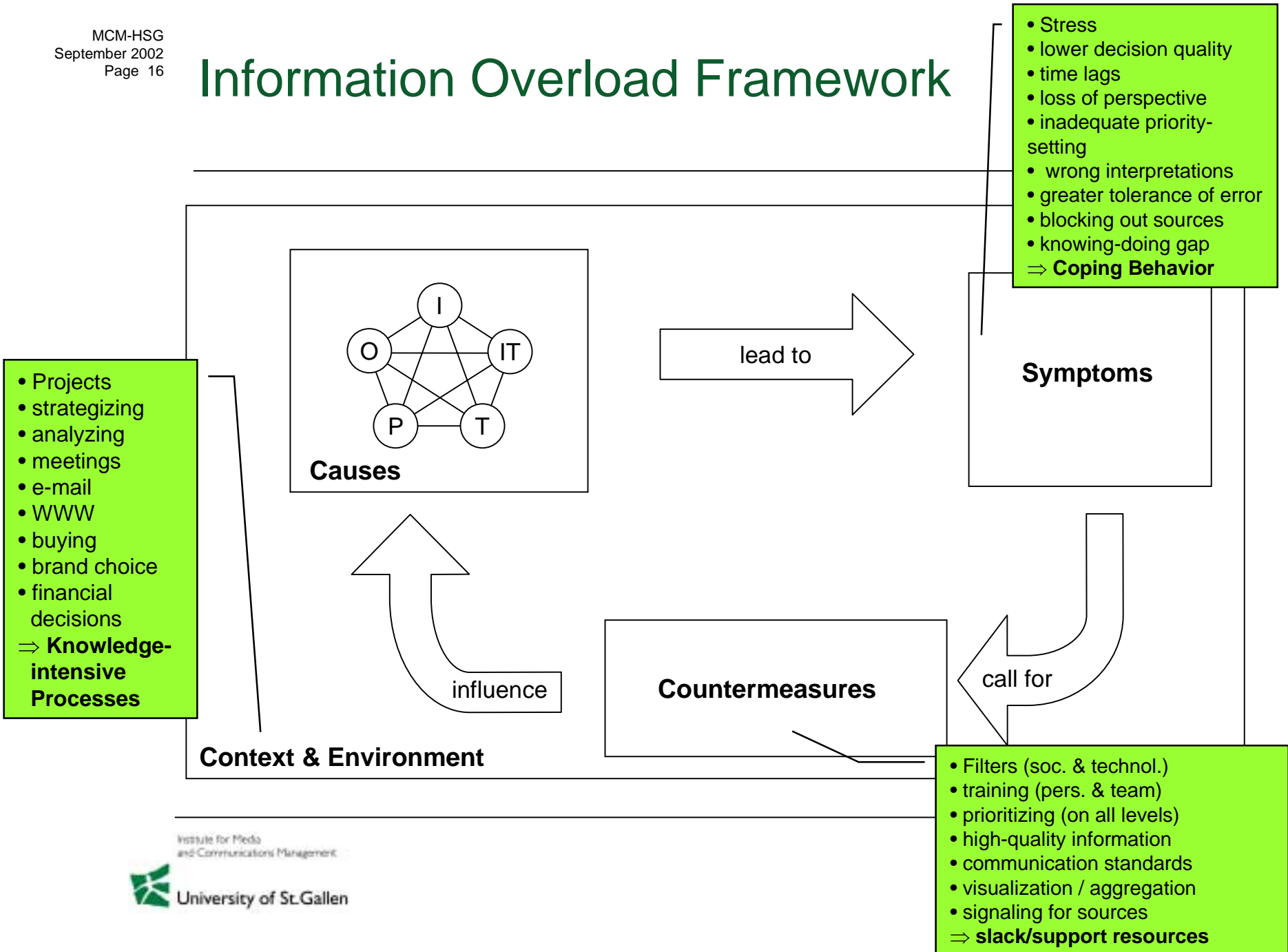


# Agenda

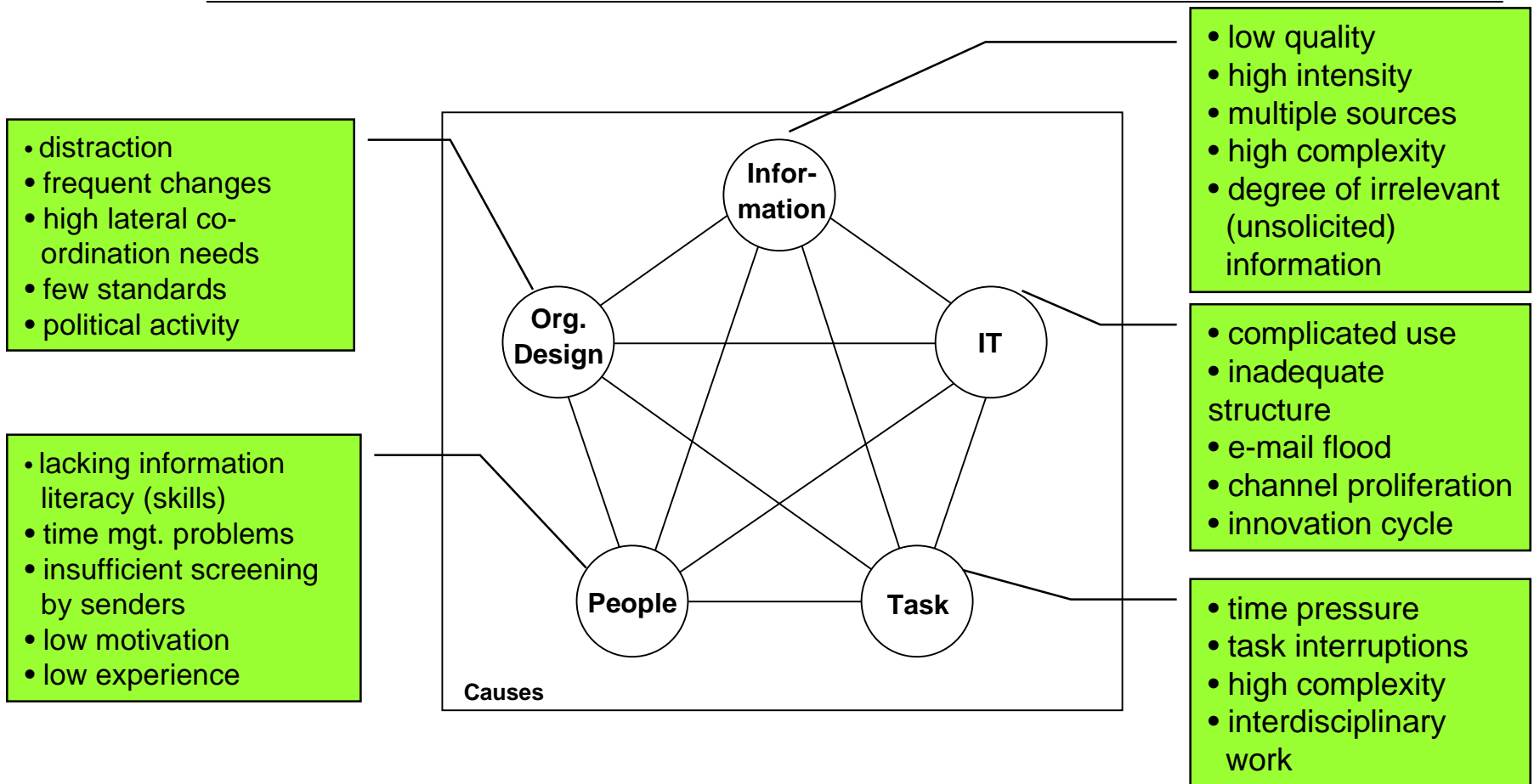
---



# Information Overload Framework



# Information Overload Framework: Main Causes



# Knowing-Doing Gap: When Talk Substitutes Action

---

*Overload is aggravated by micro-political issues.*

## Symptoms:

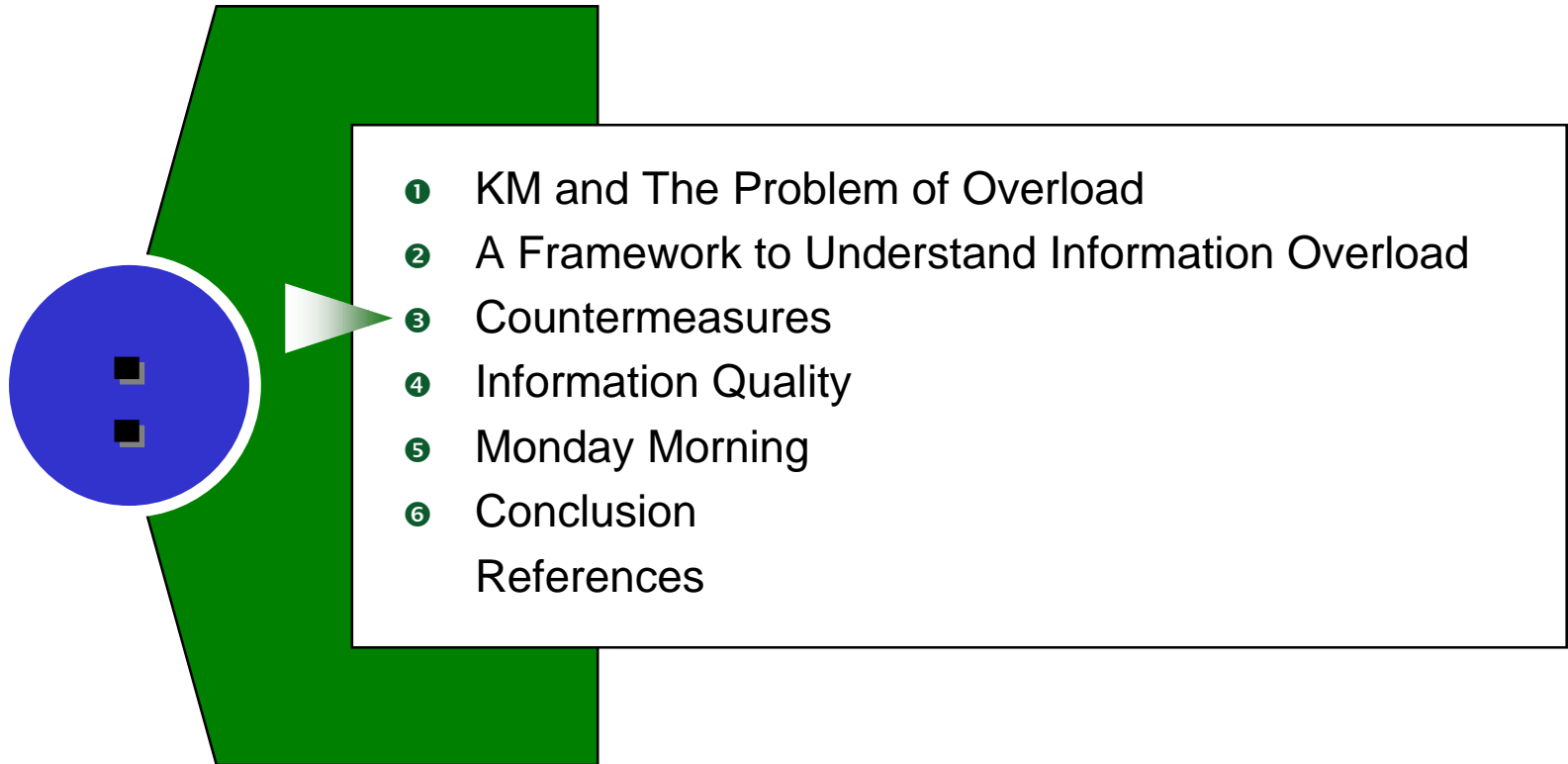
- = No **follow-ups** to ensure that what was said was done.
- = Planning, meeting, and report writing are seen as actions.
- = People are evaluated on talk rather than results.
- = **Complex language, ideas, processes, and structures are thought to be better than simple ones.**
- = There is a belief that managers are people who talk and others do.
- = Internal status comes from talking a lot, interrupting, and being critical of others' ideas.

Source: Pfeffer, J., Sutton, R.I.: The Knowing-Doing Gap, 2000

---

# Agenda

---



# Inadequate Countermeasures: Coping Strategies I (Milgram 1970)

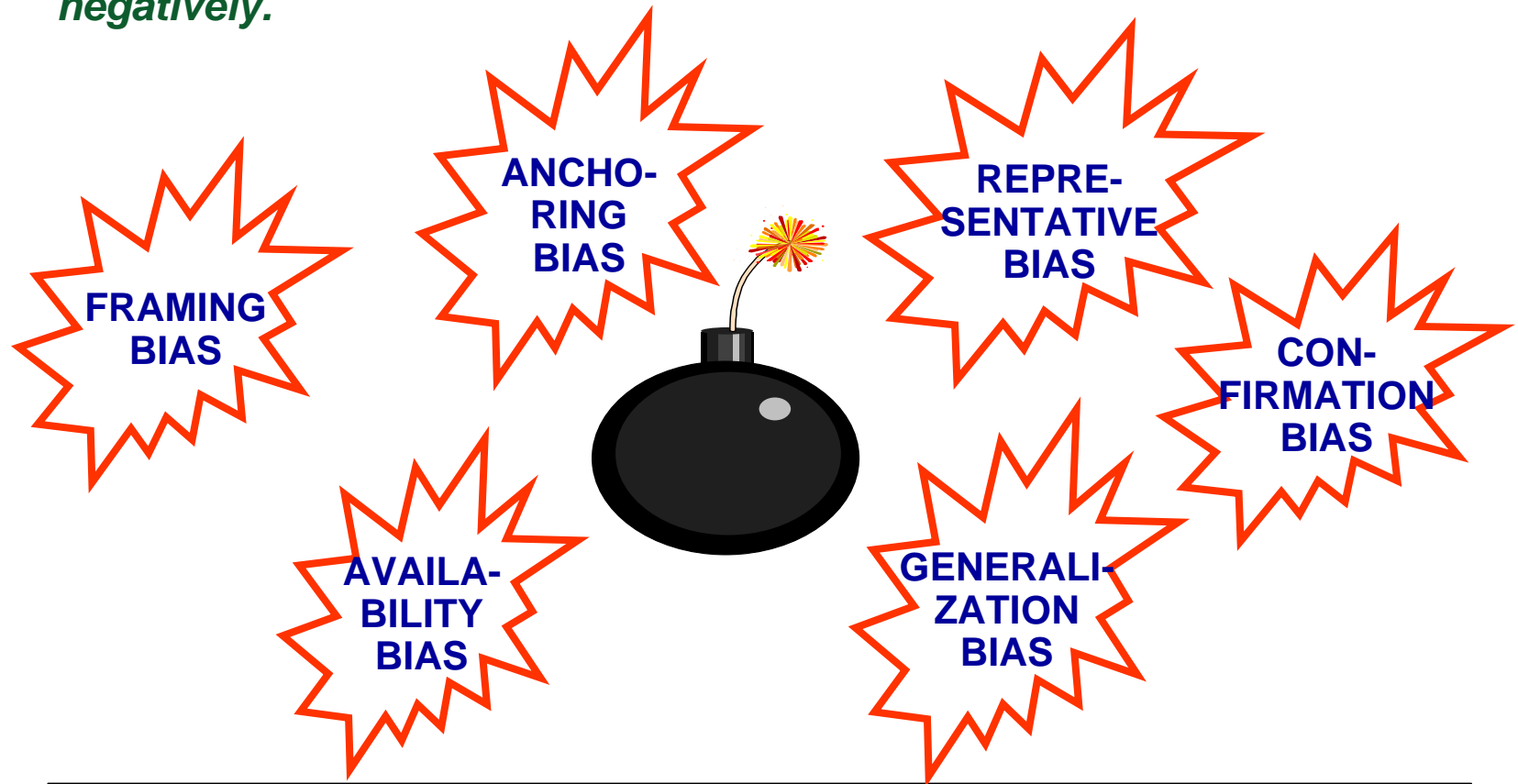
---

***Coping strategies only fight the symptoms of overload, not the causes.***

1. Allocation of less time to each input.
2. Disregard of low-priority inputs.
3. Boundaries are re-drawn in certain social transactions so that the overloaded system can shift the burden to the other party in the exchange.
4. Reception is blocked off (via unlisted telephone numbers, unfriendly facial expressions etc.)
5. The intensity of inputs is diminished by filtering devices.
6. Specialized institutions are created to absorb inputs that would otherwise swamp the individual.

# Coping Strategies II: Cognitive Biases (Hammond & Keeny, 1998)

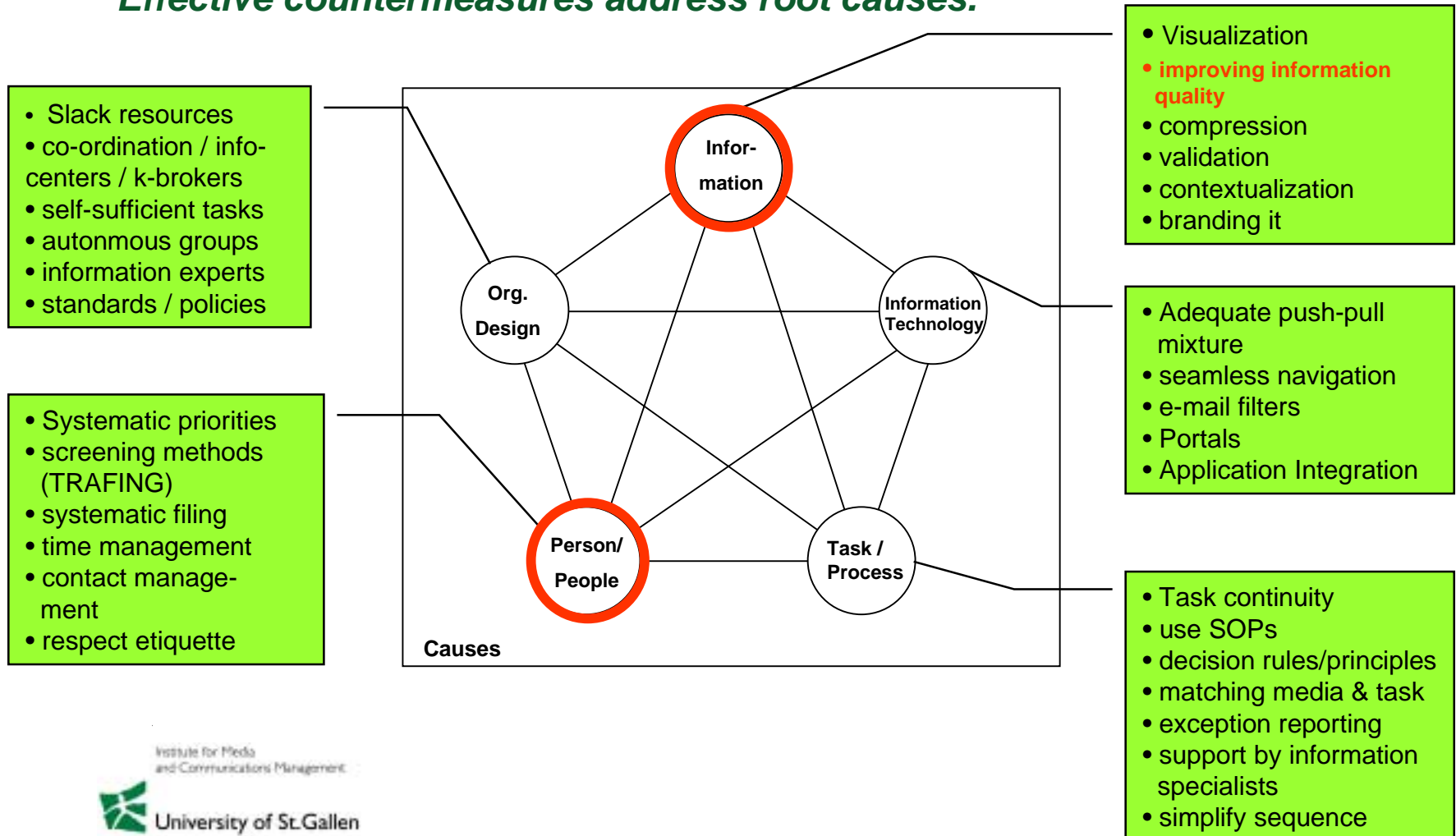
*Cognitive biases are automatic and affect our information processing negatively.*



# Countermeasures against Overload



*Effective countermeasures address root causes.*



# Personal Information Management Tools as Countermeasures

---

*Personal tools do not support systematic knowledge management.*

- = **“To do” lists (60%)**
- = **Calendar (45%)**
- = **Address book (45%)**
- = **Personal organizers (40%)**
- = **Desk diary (40%)**
- = **Pocket diary (35%)**
- = **Appointment book (15%)**

Source: Stephen Jones and Peter Thomas, “Empirical assessment of individual’s personal information management systems,” *Journal of Behavior and Information*, vol. 16, no. 3, 1997, 158-160.

# New Personal Knowledge Tools: Actlets<sup>®</sup>

---

*Actlets enable systematic reflection and action on personal knowledge management issues. They help to prevent information overload.*

- = Systematic Priorities: Synergy*Map*
- = Effective Information Screening: Info*Prio*
- = Using your Community: Expert*Web*
- = Optimizing your Time: Task*Planer*

More information: [www.reflect-actlets.de](http://www.reflect-actlets.de) or [www.knowledgemedia.org](http://www.knowledgemedia.org)

Expert-Web

Please connect the people who know each other personally by clicking on the line symbol and link the bullet points in front of each name (see the example below).

look up example

Core competence 1: Content Management Systems

- Hubert Hanser
- Georg Smith
- Susanne Dreier
- Jeff Bloom
- Urs Gaszmann
- ...

internal external

Core competence 2: IT-Industry

- Roy Müller
- Sam Müller
- Robert Reichfeld
- Frank Dast
- Hans Meyer
- Peter Lorange
- ...

internal external



Core competence 3: Project Management

- Hedy Zeller
- Oliver Tenman
- Chris Tall

internal

Improvement area: Strategy Development Methods

- ...

internal external

Information-Prioritization

Step 3: Ensure that urgent but not important information do not take too much of your time for the really important but not urgent information. Which information of the "delegate/knock off" field can you pass on to whom?

- Handle at once:**
  - client complaints
  - inquiries from head office
- Delegate or knock off:**
  - project status reports
- Plan for later handling:**
  - market research reports
  - technology updates
- Sort out quickly:**
  - corporate memos
  - educational programs
  - cc e-mails
  - seminar flyers



mcm institute reflect

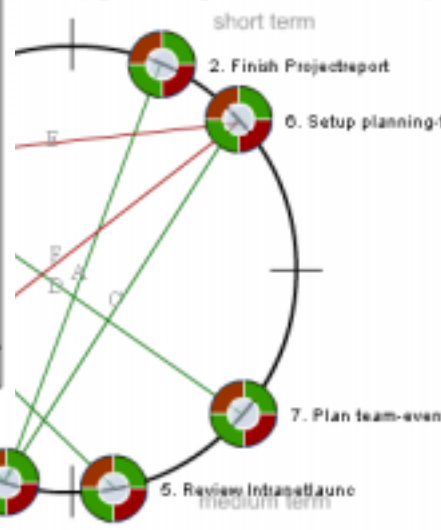
return to previous step move to next step

ie drag & drop your goals to the time circle, placing short-term goals into the first quarter, medium term in second area etc. (see example) (short term goals are those that can be achieved within three months, goals require about four months to one year, long term goals require more than one year to be completed, goals are those that should be achieved on a continuous basis, such as getting information regularly abt a domain)



back to the previous step go to next step

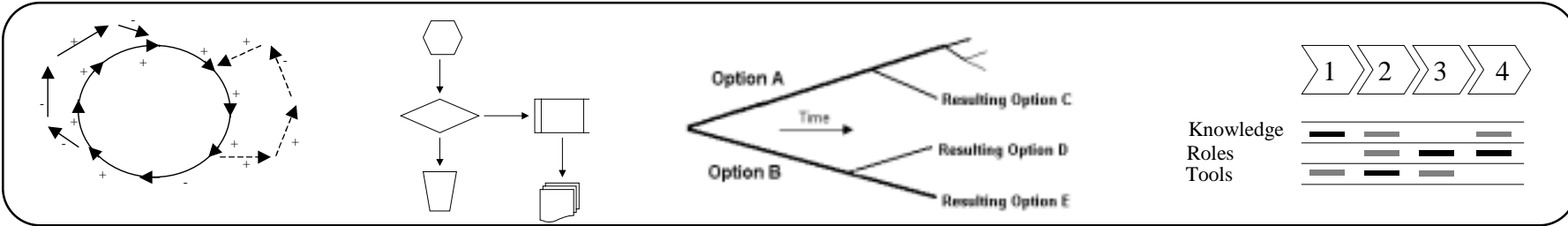
Clicking the green area and (keeping the mouse button pressed) indicates (in a box that will appear on the left) how a synergy one goal can help to reach another other). Click on the red area indicates conflicts (e.g. how one goal can block another one).



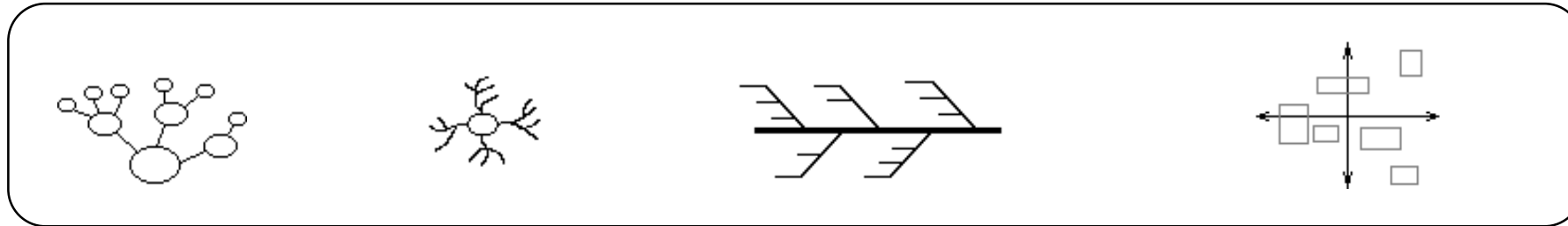
back to the previous step go to next step

# Countermeasure: Conceptual Tools

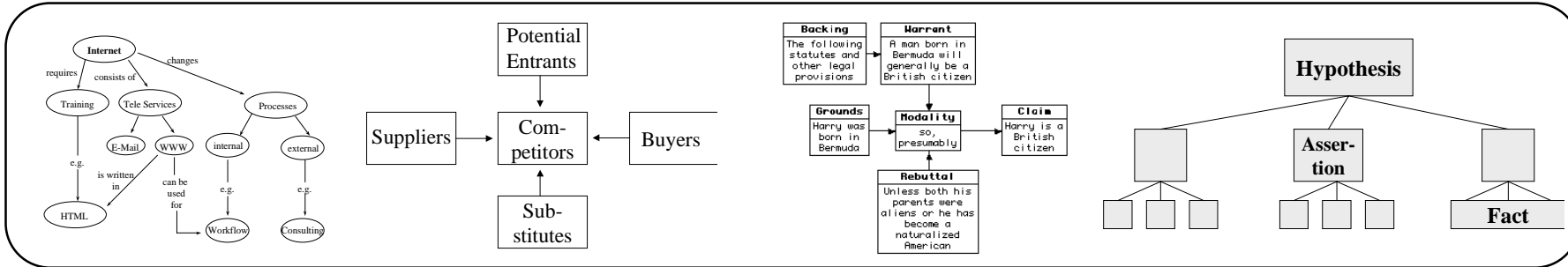
Planning



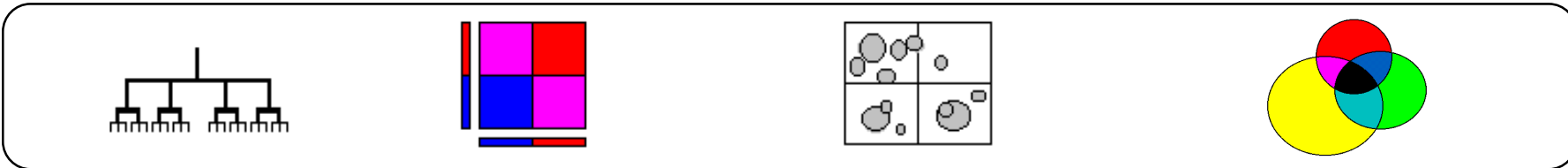
Gathering



Structuring



Relating



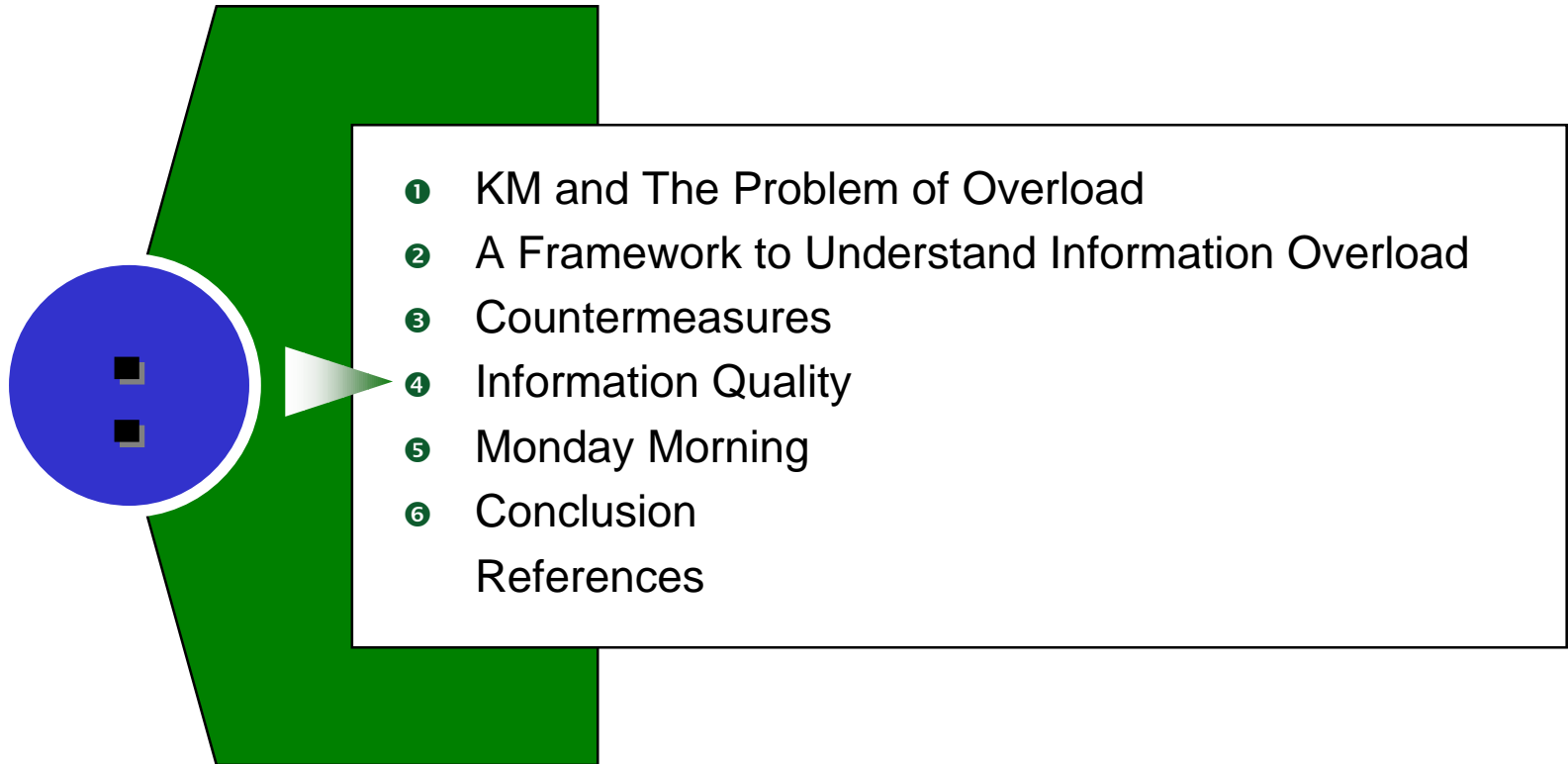
# Knowledge Maps

*Mare Paedagogica*



# Agenda

---



# Typical Information Quality Problems

---

*Many KM programs fail because of inadequate information quality.*

- „current“ = The content of an expert directory is outdated.
- „traceable“ = The authors or sources of a best practice are not identified.
- „concise“ = The homepage of a community of practice is overloaded.
- „applicable“ = The implications of a lesson learned document are unclear.
- „timely“ = A crucial piece of information arrives after a decision has already been made.
- „comprehensive“ = A knowledge application map lacks important instructions to complete a task.
- „consistent“ = An in-depth software evaluation contains contradictory analysis.
- „timely“ = A knowledge base requires ten minutes to provide the results of a query.
- „clear“ = A problem analysis report obscures the main findings through idiosyncratic terms.

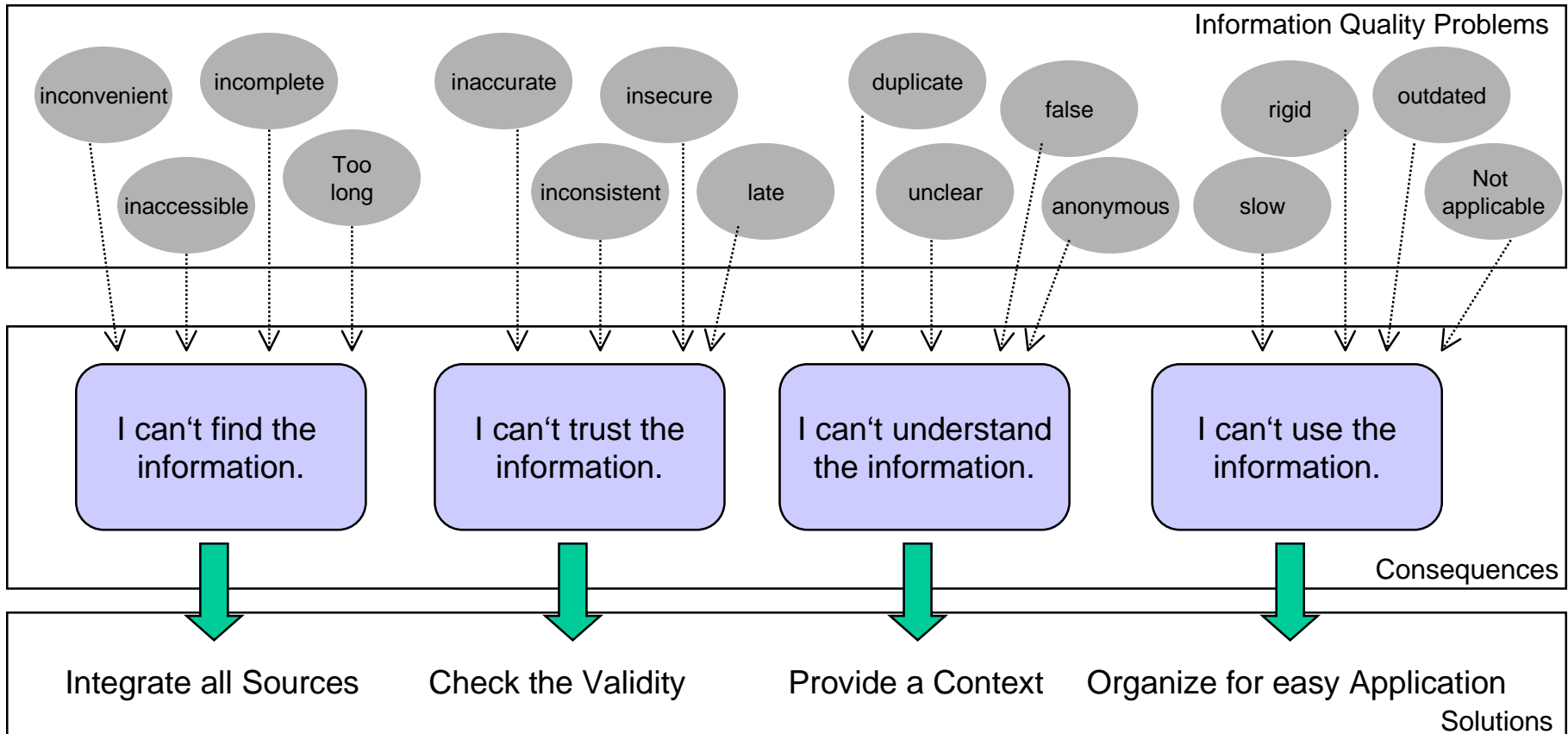
# Information Quality Definitions

---

***There are several systematic approaches to define information quality.***

- 1. Information quality can be defined as information that is *fit for use* by information consumers.** Huang, Lee, Wang (1999)
- 2. Information quality is the characteristic of information to meet or exceed customer *expectations*.** Kahn, Strong (1998)
- 3. Quality information is information that meets *specifications* or *requirements*.** Kahn, Strong (1998)
- 4. Information quality is the characteristic of information to be of *high value* to its users.** Lesca, Lesca (1995)
- 5. The degree to which information has *content, form, and time characteristics* which give it *value* to specific end users.”**  
Brien (1991)

# Information Quality Problems, Effects, and Countermeasures



# Countermeasures in Overview

***Compressing, controlling, contextualizing, and corroborating information increases its quality.***

## Integration Activities

- Visualizing concepts
- Listing sources
- Summarizing content
- Personalizing content
- Prioritizing content
- Highlighting aspects
- Giving an overview
- Eliciting patterns

## Validation Activities

- Evaluating the source
- Indicating the level of certitude / reliability
- Describing the rationale
- Comparing sources
- Examining the hidden interests / background
- Checking consistency

## Contextualization Activities

- Linking content
- Stating target groups
- Showing the purpose
- Describing the background
- Relating to prior information
- Adding meta-information
- Stating limitations

## Activation Activities

- Notifying and alerting
- Demonstrating steps
- Asking questions
- Using mnemonics and metaphors; storytelling
- Stressing consequences
- Providing examples
- Offering Interaction

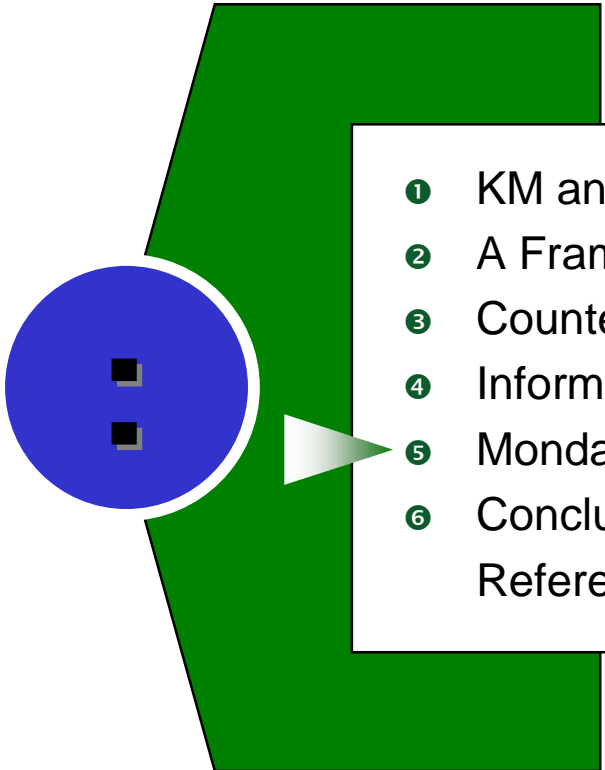
# Information Quality Measures of Analysts (Giga, Gartner, Forrester, Meta)

---

1. A clearly specified **knowledge content production process**, ranging from identifying knowledge needs to reviewing, publication and continuous updating or removal.
2. Restricted **content formats**, that is to say a strictly limited number of knowledge content types (typically a short format of one to three pages ('notes'), a longer version ('reports') of ten to twenty pages, as well as a digest format that summarizes various contributions).
3. An informal or formal **peer review process** that assures that the documented knowledge is valid and relevant. This is usually followed by a **formal check** by an experienced senior manager or specialist and by an after-publication rating of a report (in terms of its demand and impact).
4. A small set of **explicit information quality criteria** that every contribution has to meet.
5. **Guidelines** that specify how to validate sources or information.

# Agenda

---



- ① KM and The Problem of Overload
- ② A Framework to Understand Information Overload
- ③ Countermeasures
- ④ Information Quality
- ⑤ Monday Morning
- ⑥ Conclusion

References

# Monday Morning

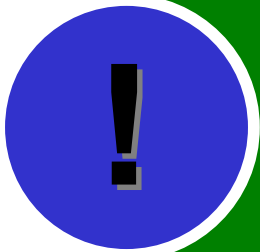
---



- = Avoid the smart talk trap, make actions count more than words.
  - = Focus on high-quality knowledge content (long half-life, wide applicability, validated results, rapid scalability) and rate/reward/highlight high-quality contributions.
  - = Integrate knowledge sources (e.g., through portals, directories, maps)
  - = Add context to codified knowledge (how was it developed? why is important? who should use it, how?)
  - = Include review cycles in your knowledge content to assure validity.
  - = Make codified knowledge visible, salient and actionable by using maps, examples, metaphors, notifications, interactions etc.
- ⇒ **Review your KM initiative: does it increase information overload or lower it? How does it ensure knowledge content quality?**

# Agenda

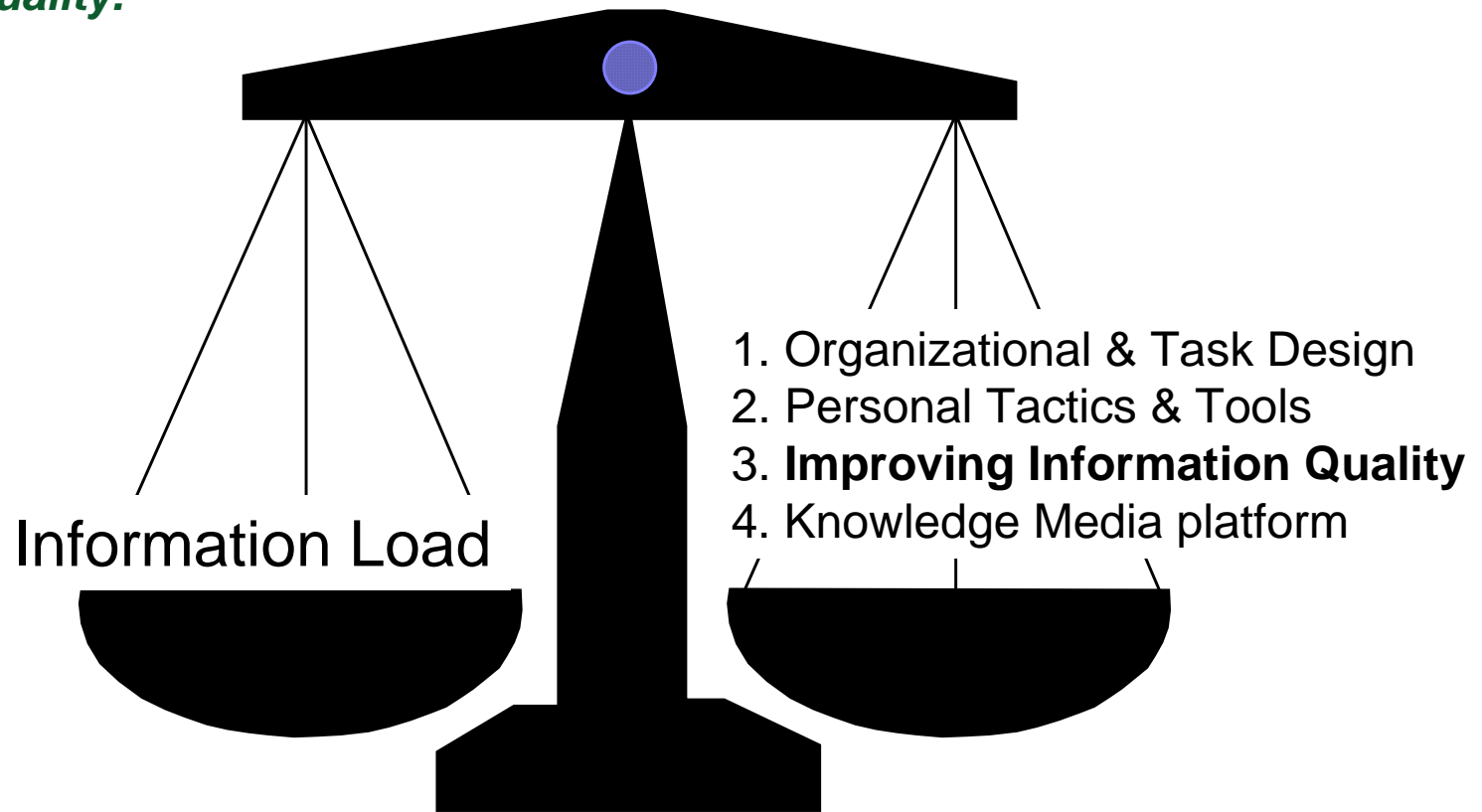
---



- ① KM and The Problem of Overload
- ② A Framework to Understand Information Overload
- ③ Countermeasures
- ④ Information Quality
- ⑤ Monday Morning
- ⑥ Conclusion  
References

# Conclusion: Fighting Knowledge Fatigue

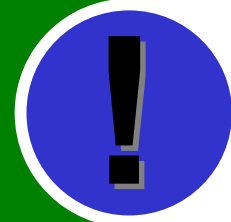
*KM should aim at lowering information load and increasing information quality.*



# Conclusion: Fighting Knowledge Fatigue

---

- = Information Overload is a key variable for knowledge managers.
- = It occurs when requirements exceed processing capacities and eventually leads to knowledge fatigue.
- = Countermeasures address the personal skills, the organizational and IT design, as well as information quality.
- = Information quality can be improved by compressing, validating, contextualizing, and activating knowledge content.



# Key References

---

- = Hammond, J. S., Keeny, R- L. (1998) The hidden traps in decision making. *Harvard Business Review*, Sep/Oct, Vol. 76, 5:47-55.
- = Huang, K.-T.; Lee, Y.W.; Wang, R.Y. (1999) *Quality Information and Knowledge*. New Jersey: Prentice Hall.
- = Pfeffer, J., Sutton, R.I. (2000) *The Knowing-Doing Gap*. Boston: Harvard Business School Press.
- = Eppler, M. (1999) *Conceptual Management Tools: A Guide to Essential Models for Knowledge Workers*, St. Gallen: NetAcademy Press.
- = Eppler, M., Sukowski, O. (2000). Managing Team Knowledge. *European Management Journal*, Vol. 18, 3:334-341.
- = Eppler, M., Will, M. (2001) Branding Knowledge. *International Journal of Brand Management*. Vol. 8, 6:445-456.
- = Sukowski, O., Eppler, M. (2002) *Knowledge Management Case Studies*. St. Gallen: NetAcademy Press.
- = Eppler, M. (2001) The Concept of Information Quality. *Studies in Communication Sciences*, 2:167-182.
- = Eppler, M. (2002) Making Knowledge visible through Knowledge Maps. Holsapple, C. (Ed.) *Handbook of Knowledge Management*, New York: Springer.
- = Eppler, M., Mengis, J. (2002) *The Concept of Information Overload*. MCM Research Paper.
- = Eppler, M. (2002) *Managing Information Quality*, New York: Springer.

# Further Readings

---

- = Tversky, A., & Kahneman, D. (1974) Judgments under uncertainty: Heuristics and biases, *Science*, 185: 1124-1131.
- = Miller, G. A. (1956) The magical number seven, plus or minus two: Some limits on our capacity for processing information, *Psychological Review*, 63, 81-97.
- = Broadbent, D. (1958) *Perception and Communication*, New York: Pergamon Press.
- = Rosch, E. (1973) Natural Categories, *Cognitive Psychology*, 7:573-605.
- = Johnson-Laird, P. M. (1983) *Mental models: Towards a cognitive science of language, inference, and consciousness*, Cambridge MA: Harvard University Press.
- = Anderson, J. R. (1982) Acquisition of cognitive skill, *Psychological Review*, 89, 369-406.