

The Quest for Intelligence in SME's;

Acting on External Information by Development of Internal Practices

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Abstract: Organizational Intelligence (OI) focuses particularly on the systematic processing of information from external sources in order to enhance the ability to foresee the future and to adapt to changes in the environment. Traditionally this pursuit of intelligence has been regarded as a central organizational function focusing on information retrieval and information provision. OI has also been regarded as an issue mainly reserved for the larger companies. In pace with the development of global markets even for small and medium sized enterprises (SME), the urge for Organizational Intelligence (OI) in these companies is increasing. This paper presents a model for describing how intelligence is obtained in successful SME's. The model is evaluated and tested through case based reasoning towards a framework for describing OI in SME's.

This research explores OI from a different perspective in promoting a more action-directed approach investigating how organizational intelligence is expressed in organizational processes and routines. The core contribution from the work presented is that OI in SME's is effectively explained by the contribution from motivated knowledge workers commitment to organizational intelligence activities as expressed in knowledge management practices. This statement is supported by an empirical investigation which is built on a case study of a successful company, Bend&Weld Ltd, showing rapid, sustainable and profitable growth. The case of Bend&Weld address the main question; *How can the pursuit of Organizational Intelligence in successful small and medium sized enterprises be explained and described?*, supported by the sub questions; *How can individual knowledge workers spontaneous environmental scanning support Organizational Intelligence?*, and, *What role can routines and procedures play in the pursuit of Organizational Intelligence?* The findings demonstrate that organizational intelligence is not limited to an information processing function but rather should be viewed as an outcome of planned knowledge management practices constituting core organizational business processes. SME's recognize the need to be attentive to their environments but are not aware nor can describe in what way they are pursuing intelligence. The result of a five year research project presents a model to describe and understand the pursuit of intelligence in SME's

Keywords: Organizational Intelligence, SME, Knowledge Management Practices,

Background

Organizations may contain many pieces of intelligence but lots of intelligent pieces do not add up to an intelligent organization. OI is characterized by collaborative problem solving between people and technical artifacts. Intelligent organizations have the ability to grasp complex information from the environment and the ability to learn through knowledge sharing. Because the environment is growing in complexity and volatility, sustainable viability requires organizations to learn enough about the current and likely future conditions of the environment and to use this knowledge to change their own behavior in a timely way (Huber 2004). Intelligence work in larger corporations is mainly perceived as an information management function. The Pursuit of OI is often synonymous with implementation of data warehouse driven business intelligence applications. SME's do not have neither the resources, perceived needs nor the necessary skills to define end purchase such solutions. Still they need continuous and systemic approaches to Organizational Intelligence in order to stay competitive on their markets.

Intelligence in small and medium sized enterprises functions as a way of putting context to knowledge sharing. Intelligent organizations have the ability to grasp complex information from the environment, the capabilities to learn through knowledge sharing and the ability to act on the generated knowledge. Because the environment is growing in complexity and volatility, sustainable viability requires organizations to learn enough about the current and likely future conditions of the environment and to use this knowledge to change their own behaviour in a timely way. The practices implemented in order to coordinate and make the distributed knowledge an organizational asset is at its core a knowledge sharing practice. This should not be confused with setting up practices for information

management. The mere provision of information is not enough. Efficient information management can be regarded as a subset or the fuel of Organizational Intelligence.

Dealing with the environment in SME

Companies defined as Small and Medium sized Enterprises (SME) normally do not have the capacity of allocating resources exclusively to deal with the environment of the company. But implementing an Organizational Intelligence system is not an all or nothing proposition. Portions of the intelligence-gathering processes can be formalized while others remain informal. In small companies the corporate culture can be strong enough to reinforce informal OI systems in being effective and efficient. An OI system can be based on allocating existing personnel to the job on a part-time basis and by raising every employee's awareness to intelligence needs (Gilad and Gilad 1988).

Implementing information in organizational routines

Organizational routines consist by nature of condensed information. Routines are implemented with the purpose of making the organization function in an effective and efficient way. By implementing routines, that often represents "best practices", it is easier for the workers to perform efficiently and effectively in a predictable way. Routines are accommodated to the specific organization in order to direct attention to tasks that are assessed as useful for the organization. This is a generic principle and concerns all routines from production to administration. The routines may origin from long traditions within the company and have evolved over a number of years.

Theory

The birth of the concept of Organizational Intelligence

The concept Organizational Intelligence is first used by Harold Wilensky in his book "Organizational Intelligence" from 1967 (Wilensky 1967). Even back in the 1960's Wilensky is suggesting that the area framed by the concept of organizational intelligence is not attended by scholars to the extent that it deserves. Wilensky states "It is strange that social scientists, who are by profession devoted to the application of reason to man's affairs, have been more impressed by the use and misuse of power than by the use and misuse of knowledge". Wilensky appreciates the potential importance of managing knowledge in organizations and connects the concept of organizational intelligence to knowledge management.

The here presented work is based on an extensive literature study within the field of Knowledge management concerning Organizational Intelligence. Table 1 represents an overview of scholarly work that has influenced the view on Organizational Intelligence presented in this paper.

Table 1: Theoretical frame

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Authors(s)	Key points	Contribution to OI-model
(Wilensky 1967)	Formal systematic BI system	Use of internal non-specialists.
(El Sawy 1985)	Relationship between organizational context and design of scanning systems	Effective scanning systems aligned with requirements of their context. Delegate intelligence responsibility to subunit managers and staff.
(Gilad and Gilad 1988)	Comprehensive information management system	Passive and Active intelligence gathering. Need for a systematic approach. Use of internal resources.
(Friedman, Friedman et al. 1997)	Base of action; by choice or by rules. Ambiguity concerning action and learning and intelligence.	Urge to explore Rule-based actions. Lessons of history encoded in routines.
(March 1999)	Spontaneous environmental scanning. Decentralized structure. Enacted environment. Perspective and attention.	Knowledge workers contribute in their enacted environment. Perspectives guide attention. Spontaneous environmental scanning.
(Hamrefors 1999)	Information management system. Models of environmental scanning	Organization-wide information collection network.
(Choo 2002)	Firms must be congruent with their environment. Future environments will be different through accelerating change.	Increasingly complex and volatile environment. Increasing scientific knowledge – causal reasoning. Survival requires innovation.

(Huber 2004)	Information acquisition and use are time and knowledge specific.	Time decreases the value of information.. Specific knowledge is required for use and acquisition of information
(Choudhury and Sampler 1997)	Model for strategic scanning modes	Modes for passive and active environmental scanning

Friedman & Friedman (1997) propose a systematic approach on intelligence gathering in organizations. They state that an intelligence system does not mean an intelligence department but rather a system for doing intelligence. Human understanding is stated to be indispensable for turning information into knowledge and Friedman&Friedman suggests that anyone believing that technology e.g. artificial intelligence will solve the problem in the future should find a hobby, for example watching glaciers move, while waiting. Friedman&Friedman have a clear information management perspective on intelligence systems.

This is also true for Choo (2002). His perspective is manifested in the statement that information is the meta-resource that coordinates the mobilization of the other assets in order for the organization to perform. Competition has turned into an information race of discovery and learning. (Choo 2002). Choo seconds the opinion that people are the most valuable information providers.

March (2002) puts forward some problems concerning organizational learning and intelligence. Learning does not always lead to intelligent behaviour. The same processes that yield experiential learning produce superstitious learning. But despite these problems there are, according to March, adequate evidence that lessons of history as encoded in routines are an important basis for the intelligence of organizations. The findings from Choudhury&Sampler(1997) states that information acquisition choices are based on specificity of the desired information. This implies that both use and acquisition of information should be performed in context by the potential users and not performed out of context by specialists in separate departments. Although there might be a need for an intelligence department, it's major role would probably be to provide organizational support to the function as such on an administrative level.

This notion of alignment of context and design of intelligence systems is recognized by the work of Yasi-Ardekani & Nystrom, (Yasai-Ardekani and Nystrom 1996)

Hamrefors (1999) puts forward the statement that all monitoring of the environmental is based on individual environmental scanning, spontaneous environmental scanning, a function that is always active among all humans. The attention directing this individual scanning is dependant on different perspectives and perspectives can be supported by organizations. Concepts like top management and organizational culture and previous and present engagement in activities are influencing different perspectives

Contributions extracted from the work presented in table 1 constitute the basis for a model on Organizational Intelligence. This model comprises a set of principles that according to literature are essential in forming a successful intelligence system in organizations..

The dimensions extracted from literature are presented in figure 2.

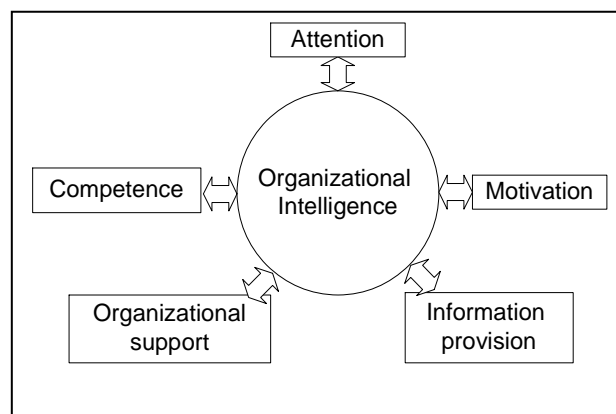


Figure 1 :. Dimensions in Organizational intelligence

These dimensions were selected and used as a reference in investigating the intelligence system in a successful knowledge creating company. The aim of the case study was to look for indication of the usefulness of these dimensions.

Method

In order to empirically study how intelligence is performed in SME a case research design was performed. It takes its departure in Structuration theory directing attention to the importance of actions. The idea was to observe and interview management in a successful SME performed in order to investigate how knowledge management practices relate to intelligence work. The theoretical model describing important dimensions in intelligence work was used as a theoretical lens when analysing the empirical data. By combining theoretical insights with empirical data a framework combining Organizational Intelligence with Knowledge management practices was constructed.

Philosophical roots; Structuration Theory

Structuration theory (Giddens 1976, 2nd edition 1993; Giddens 1979; Giddens 1984) may be seen as an attempt to resolve a fundamental division between those who consider social phenomena as products of the action of human 'agents' in the light of their subjective interpretation of the world, and others who see them as caused by the influence of objective, exogenous social structures. Giddens proposes that structure and agency should be viewed not as independent and conflicting elements but rather as mutually interacting in duality. Structure is not simply a straightjacket, but also a resource to be deployed by humans in their actions. Structuration is an ongoing process rather than structure as a static property of social systems.

One case is enough

Easton (2003) suggests that the problem of generalisability concerning case based research is dependant on the ontological and epistemological assumptions. In positivist ontology and epistemology tradition a call for multiple cases are suggested in demonstrating generalisability (Eisenhardt 1989). Easton states that one case study is enough under certain conditions. *"We can know a great deal about the general from the specific if we know where to look and the general can be hidden in a vast number of cases if we don't"* (Easton 2003). In this work we are aligned with the statement that the most important characteristic of case research is the use of different data sources. This involves not just the output as evidence but also the process by which the research is carried out. Concentration on one case allows researchers to go back to the research site several times collecting data. Analyzing and reflecting as part of the research design allows for iterative testing the understandings achieved. The justification for using a single case has its roots in a defensible epistemological position. The power of any paradigm is that we accept certain basic postulates. What we want ideally is theory that will apply and is 'true' everywhere and all the time. Clearly this will never be possible but the closer we get to the ideal the better.

Responsive interviewing

When investigating the idea that Organizational Intelligence in SME could be described and developed through organizational routines and practices, it is not possible to put direct questions to interviewees and expect adequate answers. The OI system in SME's are embedded in existing processes and routines being more or less successful depending on the specific organization. In most cases the OI system is not visible to the employees. The OI system is not a concrete and visible object and is not defined by established models and hence cannot be studied in a direct objective way. The method used in this research regarding interviewing as means of collecting data is known as responsive interviewing (RI) (Rubin and Rubin 2005). The main idea behind RI is to let the respondent "tell their story". But this "storytelling" is constrained by the main questions defined by the researcher. The basic structure of RI concerns the researcher responding to and then asking further questions about what he hears from the interviewees rather than relying on predetermined questions. The relationship between interviewer and respondents is characterized by the interviewer working with respondents as partners rather than treating them as objects of research. One important guideline in applying RI is to address the appropriate respondent. To direct questions to respondents that lack the knowledge or insight needed to respond is not meaningful. Respondents were surprisingly generous with their time when exposed to a "conversation" that they found engaging. When the author became knowledgeable enough about the case-company; Bend&Weld and developed some skill in creating appropriate "conversations" with appropriate respondents the full potential of the method named responsive interviewing came into play.

The case of Bend&Weld

Bend and Weld Ltd is a successful enterprise. In financial terms the company has showed increased revenues during the last ten years. The company has doubled itself four times and are well on the way of doing so a fifth time. At their core Bend&Weld can be considered an “intelligent enterprise” (Quinn 2005) converting intellectual resources into a chain of service outputs building effective internal processes to perform high quality services to its customers. Albeit being a manufacturing company with a reasonable simple core competence, bending and welding steel, its success is founded in the development of knowledge management practices. The engineering workshop do not prosper on a strategy of plant economy of scale but rather on the ability to manufacture small series of products specialized and often enough developed in cooperation with its customers, or partners as they preferably name them. They view themselves as co-contractors in partnerships engaging in problem solving for the benefit of their customers.

The problem solving company

Bend&Weld regard themselves as problem solvers and tries to engage with their customers in early phases of the projects that lead to contracts with Bend&Weld. The products coming out of the Bend&Weld production lines are extremely varied concerning amount, size and complexity. Their scope of products comprise some 3000 articles in the range from a small piece of metal that is bent and supposed to fit into some door on a caterpillar or as some kind of suspension device on a wall cupboard spanning through more complex metal pieces that are bent, welded, drilled and painted, to entire cabins of a rock drilling machines including the assembly of pneumatic tubes and pipes.

Knowledge Management Practices

According to their own statement a turning point for Bend&Weld was when they decided to start the process towards ISO 9001 certification. This process originated implicitly from customer demand and was supported financially by governmental authorities. Bend&Weld realized that they would be excluded from winning contracts if they were unable to demonstrate trustworthy routines and processes in their work on quality. It took a few years to identify and work through all processes but the process was regarded as successful. Today Bend&Weld are very proud of their quality-system and they state it to be a competitive advantage. They can demonstrate cases when they have been asked to take on contracts due to the fact that their quality system is formalized, externalized and recognized by their customers or co-contractors as they prefer to call them.

The difference is not primarily that the artefacts leaving the Bend&Weld workshop are of superior quality. There are few secrets on how to bend and weld steel. Rather the difference is their ability to act as problem solvers in relation to their co contractors, their ability to produce a multitude of products in small series with preserved quality and at reasonable prizes, their system for identifying and attending “deviations”. An expression often heard at the workshop, an obvious heritage from the ISO 9001 certification process. In balancing formal structures with autonomy Bend&Weld have successfully formed management methods and practices. It is these knowledge management practices that are the object of study in order to investigate if systematic and continuous Organizational Intelligence can be developed and expressed.

Organizational Intelligence at Bend&Weld Ltd

A notion that is prevalent throughout the organization demonstrated by unprovoked utterances from a majority of all interviewees comprised in the case study is the fear of being ‘home-blind’. It is remarkable how often the awareness of the danger of not being alert and attentive to ideas and practices outside what is currently known is expressed. This insight is targeting the individual employees as well as the organization at large. Numerous examples of the existence of this mindset have been expressed throughout the case study. Ulf, the person that brought the industrial fan production line to Bend&Weld has expanded his scope of work and customer contacts beyond just the production of industrial fans. His production line is still under expansive development comprising approximately 7% of the total revenue at Bend&Weld and aiming at 20% of the total revenue. But Ulf have expanded to other types of products with the expressed purpose of not being ‘home-blind’. He expresses a belief that his specific and unique knowledge, perspective and way of doing things may foster new and improved ways of producing and designing solutions regarding other products produced at Bend&Weld. The motivation driving him to expand his field of expertise was to gin new and interesting assignments keeping his personal development as a professional and as an individual

dynamic and evolving. Ulf do not want to just follow the same wheel-tracks but he seeks new challenges. *“It is fun to try new things”* says Ulf.

Results

The rationale for the five dimensions derived from the literature study, Attention, Motivation, Competence, Information provision and Organizational enablers, as reported earlier in this work, are a mix of individual capabilities and organizational support practices and decisions. Attention is fundamentally an individual quality but can be described as an organizational characteristic. If individuals are attentive and contribute with input and interpretations, this will lead to an organizational capability differencing among business competitors. Motivation is also an individual quality manifested in the action that individual employees are willing to take. Mostly demonstrated and identified by action that are performed beyond what is expected from formal job descriptions. But motivation can also be regarded as an organizational capacity when being skilful in motivating their employees. Information provision is the most covered aspect in literature and deal with how organization should support the inflow of external information. Described under the label of Business intelligence techniques like data warehousing and data marts are put forward. The technological paradigm is dominant but there are also results reported concerning mechanism for knowledge sharing in the context of social networks. Concepts like sharing best practices, communities of practice and using knowledge repositories are explored and described. Scarcely in the context of small and medium sized organizations though. The projects described includes investments in money and working hours that are considerable and beyond what is feasible for small organizations. Organizational support is by definition an organizational quality. The aim of the support though is to make an impact on individual performance. The question emerging from the literature study was what this support would look like in small and medium sized organization when it comes to effective organizational intelligence. Competence comprises just like the other dimensions presented two perspectives. On the one hand competence can be describes as an individual quality but on the other hand competence is an organizational capability in the perspective of what contacts to be able to take on and the ability to make money and prosper as a viable company. In this work we agree with the perspective that organizational knowledge exists. That knowledge and hence competence that can be ascribed to the organization goes beyond the individual competence and knowledge in that it stays within the firm in spite of people being replaced over time. The organizational knowledge is manifested in routines and practices.

The major reason for constant and dynamic reflection and questioning of the knowledge management practices comprised within quality management systems like ISO 9000 is that the notion of what is “normal” changes over time. *“At the present this is normal, but it won’t be tomorrow”* (CEO, Bend&Weld).

Table 2 : Knowledge management practices

Table 2: Knowledge Management practices / Organizational routines		
Dimension	Sub dimensions	Knowledge Management Practices
Attention	Culture	Norms and values expressed (ISO 14001). All for customer benefits.
	Top Management	Active and present. Weekly meetings.
Motivation	Extrinsic	Monthly feedback on formal system of bonuses. Competence matrix points influencing salary.
	Intrinsic	Active list of proposed improvements. Spontaneous suggestions for process improvements. Low employee turnover.
Competence	Visibility	Formal competence matrix.
	Development	Annual competence audit. Personal development plans. In-house vocational training staff. .
	Use	Autonomous working groups.
Information provision	Environmental scanning (passive)	Internet. Daily business newspaper.
	Environmental probing (active)	Personal informal networks. Formal municipality supported business network
Organizational enablers	Organizational transparency	Informal management by walking. Well-known and few overarching principles. Norms and values externalized.
	Coordinating logic	Core message; “the customer”, Formal routines expressed
	Knowledge transfer	Annual education (ISO 9001 ISO 14001)

Table 2 demonstrates utterances of the dimensions described in the action oriented perspective on Organizational Intelligence presented in this paper. These dimensions are obviously not acting in solitude but are intervened and inter-dependant in a web of relations but the practices categorized together with a specific dimension is stated to demonstrate a significant portion of the dimension in question.

In order to “improve” (another expression inherited from ISO 9001 certification process) these processes, information from the surrounding environment are more or less a prerequisite.

One example of the applicability of the OI-framework

Stefan, the team leader who brought the multi operational machine to Bend&Weld has a previous experience of being the CEO of a small company in the business of bending and welding steel. They were at most nine employees but unfortunately they tried to compete on a market where competition from low cost countries in Eastern Europe and Asia were growing and eventually was impossible to overcome. The business plan of this small company was unfortunately within the paradigm of industrialism and was built around mass-production supported by computerized welding-robots. This was a battle bound to be lost. And so it was. But with the experience of trying to apply and maximize technology in supporting production within the welding industry, Stefan took two of his co-workers in the team, supported by Bend&Weld, and went to the annual technical exhibition comprising for industry production. The team came back with a concrete idea of implementing a multi-operational machine into the production. One motivation for this initiative, although not actively and theoretically supported by top management at Bend&Weld, is that it was to boring to repeat work tasks by hand over and over again with little or no variation. Stefan initiated and pursued the project of bringing new technology in to the organization. A second motivation driving him was to prove that it could be done, in spite of top managements sceptic attitude and disbelief that Bend&Weld could in an economically and effective way make use of this technology. Stefan succeeded both in minimizing dull and repetitive work and in proving to top management that his insights and efforts of implementing new technology was very efficient and effective in the production line of Bend&Weld. In his own words; “we should go to trade exhibitions on a regular basis because you constantly need impressions to avoid becoming ‘home-blind’”.

This example illustrates the usefulness of the framework in explaining intelligence work in SME.

- **Attention** is directed towards new technology through a problem-solving situation. The work is dull and I want to do something about it. It is perceived as possible since the organizational culture is allowing initiatives.
- **Motivation** is illustrated by an internal drive to make it happen. When asked, Stefan stated that: “*It was fun to see if it could work*” in explaining why he did put such an amount of his own time in pursuing his idea. Stefan was expected to perform his ordinary work along with forming the basis for a decision on purchasing the new technology. But he was authorized to perform experiments and calculations.
- **Competence** is illustrated both as in the personal knowledge and experiences that Stefan brought to the company when he became employed but also in an organizational dimension in encouraging autonomous initiatives in using personal skills.
- **Information provision** is illustrated by the visit to the technical exhibition.
- **Organizational enables** are illustrated in terms of organizational transparency expressed by Stefan as: “*We are normally allowed to follow up on our ideas*”.

In this work we propose that the here presented framework represent a useful way of describing and understanding the mechanism of Organizational Intelligence in SME

Conclusions

Organizational Intelligence (OI) in Small and Medium sized enterprises can not be described and understood in terms of information management. Organizational Intelligence in SME is fundamentally based on the employee’s individual and spontaneous scanning of the environment. Organizational Intelligence has both an individual and an organizational dimension. These two dimensions are represented in the core concepts building the theoretically driven side of the OI-framework. These core concepts are represented in routines defined as Knowledge Management practises. In addressing the question *How can the pursuit of Organizational Intelligence in successful small and medium sized enterprises be explained and described?* This work proposes that a holistic view as described in the OI-framework based on Knowledge Management practices constitutes a plausible way of explaining Organizational Intelligence in SME. Successful SME rely on effective Knowledge Management (KM) practises and hence build an effective Organizational Intelligence system if they

succeed in combining the dimensions presented in the OI-framework. The OI-system is a spin-off from effective KM practices. In addressing the question: *How can individual knowledge workers spontaneous environmental scanning support Organizational Intelligence?* This work demonstrates that the foundation of effective OI in SME is based on the decentralized contributions from all members of the organization, The contribution differ in character in line with the context defining organizational members responsibilities. The line workers contribute to improvements in production processes, management contributes to improvements in management practices. In addressing the question: *What role can routines and procedures play in the pursuit of Organizational Intelligence?* This work demonstrates that the systematics and continuity in OI is represented by routines and practices labelled as Knowledge Management practices. The OI system is embedded in the routines and practices building the business processes in the company. A prerequisite for the individual contribution to the OI system of the firm is that there is organizational feedback systems implemented to recognize the contributions, e.g. Knowledge Management Practices

References

- Choo, C. W. (2002). Information Management for the Intelligent organization: the art of scanning the environment. Medford, Information Today Inc.
- Choudhury, V. and J. L. Sampler (1997). "Information Specificity and Environmental Scanning: An Economic Perspective." MIS Quaterly(March): 25-50.
- Easton, G. (2003). One case study is enough. Academy of Marketing Conference, Aston University.
- Eisenhardt, K. M. (1989). "Building Theories from Case Study Research." Academy of Management Review **14**(4): 532-550.
- El Sawy, O. A. (1985). "Personal Information Systems for Strategic Scanning in Turbulent Environments: Can the CEO go On-line." MIS Quaterly: 53-60.
- Friedman, G., M. Friedman, et al. (1997). The Intelligence Edge, Random House UK Ltd.
- Giddens, A. (1976, 2nd edition 1993). New Rules of Sociological Method. Cambridge, Polity.
- Giddens, A. (1979). Central Problems in Social Theory. Basingstroke, Macmillan.
- Giddens, A. (1984). The Constitution of Society. Cambridge, Polity.
- Gilad, B. and T. Gilad (1988). The Business Intelligence System, American Management Association, New York.
- Hamrefors, S. (1999). Spontaneous Environmental Scanning: Putting "putting into perspective" into perspective, EFI, Stockholm School of Economics.
- Huber, G. P. (2004). The Necessary Nature of Future Firms: Attributes of Survivors in a Changing World, Sage Publications Inc.
- March, J. G. (1999). The Pursuit of Organizational Intelligence, Blackwell Publishers Inc.
- Quinn, J. B. (2005). "The intelligent enterprise a new paradigm." Academy of Management Executive **19**(4): 109-121.
- Rubin, H. J. and I. S. Rubin (2005). Qualitative interviewing: the art of hearing data, SAGE Publications Inc.
- Wilensky, H. L. (1967). Organizational Intelligence; Knowledge and Ploicy in Government and Industry. New York, Basic Books Inc.
- Yasai-Ardekani, M. and P. C. Nystrom (1996). "Designs for Environmental Scanning Systems: Tests of a Contingency Theory." Management Science **42**(2): 187-204.