

# Organizational Information Requirements, Media Richness and Structural Design

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## Individual Article Review

### Full Bibliographic Reference

Richard Daft and Robert H. Lengel, "Organizational Information Requirements, Media Richness and Structural Design," *The Institute of Management Sciences*, Vol. 32, No. 5: pp. 554-571, May 1986.

### Introduction

The abundance of information and the need to continuously have more brings to light the information requirements of organizations. The need for information is to both reduce uncertainty and reduce equivocality. This need for more information is driven by the abundance of personal computers in the user community. Identifying the right situation for a given problem will contribute to media richness. Acquiring more data is not always the solution. It is more important to have a structure around the means to best utilize the requested information. The objective of Richard Daft and Robert Lengel [1] is to demonstrate how organizations can increase media richness with structural design, reducing uncertainty and equivocality. Identifying a means to encourage media rich information at the organization level is a domain that executives have been in need of for decades.

The intended audience for this article is those individuals who work at the organization level and have critical decision-making power. The nature of critical decision-making calls for group decisions that contribute to equivocality. Bringing awareness to individuals who are at a senior level but primarily have sole decision-making authority is also a benefit of this article as well as those individuals who work with information systems development. Providing awareness to the importance of media richness as tasks overlap is beneficial. It is important to have an understanding of business processes that surround organizational requirements, but the style of writing in the article does lend itself to easy interpretation by an individual with some information processing background. Targeting a media rich organizational structure supports executive information systems (EIS). Furthermore, Management Science provides an awareness of concepts and standards to benefit all managerial levels within an organization.

This conceptual article provides answers on information processing within organizations. While models are introduced and explained with the mention of studies, empirical findings have not been provided. Theories are substantiated and concepts are discussed in hopes that future research will be able to provide test results or pattern similarity definitions within structured organization and design. This article serves as encouragement for EIS information processing.

### Brief Summary

Executive Information Systems have evolved significantly over the past two decades with the advances in computer technology. Portability and high-speed Internet access have also been contributors, facilitating management's ability to readily access information. This ease of use has become a gateway of time for executives who need information for decision-making at an organizational level. Facilitating access only benefits management if the information being provided is relevant; therefore media richness is increasingly important. Starting with an analysis of 'why organizations process information'; Daft and Lengel [2] address this question by highlighting the two forces that influence information processing in an organization: uncertainty and equivocality. The objective is to "attain an acceptable level of performance [3]". Galbraith explains that the amount of information is proportionately related to reducing task-related uncertainty and attaining an acceptable level of performance [4]. Galbraith proposes that specific structural characteristics and behaviors would be associated with information requirements [5]. Studies have found that either the amount or nature of information processing is associated with task uncertainty (Meissner 1969; Gaston 1972; Bavelas 1950; Leavitt 1951; Becker and Nicholas 1969) [6]. Weich's (1979) [7] argument on reducing equivocality is a basic reason for organizing. Equivocality can be similar to uncertainty yet can be approached by having a structure an organization can adopt to meet its information processing requirements [8].

Structural design provides a foundation for organizations and also serves as a guide for consistency. Structural design also sets the stage for the known and what can be expected. Daft and Lengel [9] dispute this point by arguing the importance of organizational design and the results of obtaining information of suitable richness to reduce equivocality as well as provide sufficient data to reduce uncertainty.

“This paper attempted to integrate equivocality with uncertainty and argue that structural characteristics are used to help organizations cope with these two factors [10].” The framework represented by Daft and Lengel [11] suggests that lack of clarity for an organization is a bigger problem than lack of data. To benefit organizational decision-making, delivering the right information in a structured manner is essential. Higher clarification of data will result in media richness.

## Results

Organizational information requirements differ from those of everyday transactional systems. There is a difference between information provided to those making independent decisions than those individuals tasked with group decisions or across an organization. Looking at data from a different point of view and at a summarized level of detail alters the representation of information. Taking a structural approach is substantiated because each iteration will be consistent and known leaving the decision-making group with a consistent approach to each iteration of their evaluations. This will also facilitate the decision making process and allow for time and effort to be spent on matters being addressed or on media richness. Integrating equivocality with uncertainty influences the information processing needs organizations require to attain adequate performance [12].

The take-home message put forward in this article is to encourage structural design to support both the amount and richness of information provided to managers [13]. Increasing the certainty of tasks through structured design will bring an organization to an acceptable level of performance. This structured design may include tasks like face-to-face media for quick decision-making and written media for those tasks that show less equivocality. These individual mechanisms, once implemented, can address an array of information processing needs such as uncertainty, task coordination and aid in an unclear environment [14].

The outcome resulting from the study conducted by Daft and Lengel demonstrates a need to “explore how organizations scan and interpret the external environment, and how information feeds into decision making (Huber and McDaniel 1986) could also make a valuable contribution [15].”

## Class Readings

No class readings were cited in this article.

The following class readings cite this article:

- Te'eni [16] cites Daft and Lengel stating media richness theory have been influential with regards to communication complexity and information being misunderstood for non-routine situations.
- Schmidt, Montoya-Weiss, and Massey [17] cite Daft and Lengel with respect to the capacity of communication media to convey cues and facilitate shared understanding in a timely manner.

## Contributions

Daft and Lengel [18] were the first champions of media richness theory back in 1984, just 2 years before publishing this article. The approach taken for this article was based on two forces: uncertainty and equivocality. These forces are represented and synthesized in relation to the organization theory put forward primarily in the 1970's. Both theories have an underlying belief that organizational structure plays an important role to ensuring effective communication within an organization itself [19]. This commonality in structural design facilitates information processing for managerial decision making by ensuring useful data.

Te'eni [20] continues to improve upon existing theories of communication by providing a new model. Effective means of communication is essential when dealing with today's computing technologies due to the vast amounts of

information available. Over the past two decades, there has been an enormous shift in the role of task-oriented functions. Today's technologies allow us to measure and increase performance by linking tasks and communication mediums. "The review suggests the importance of considering task requirements in terms of interdependencies between workers. The higher the interdependency, the higher the cognitive complexity, and the more intensive the need for managing collective action becomes. Higher interdependency is assumed in judgmental tasks, which usually imply more intensive influencing [21]."

A number of recent studies have reviewed and extended theories on how managers choose a medium for a specific situation. "Thus the question for designers has become broader: how should technology be designed to make communication more effective by changing not only the medium, but also attributes of the message itself [22]?" The means and medium of communication should be chosen according to goals and situations. Rather than building on either cognitive or affective aspects of communication, the model should capture both aspects, so as to build a more accurate representation of actual behavior. Past studies have tended to concentrate on one aspect, rather than the other. This is now changing as researchers attempt to bring together relational communication in organizations, action related communication, and communication technology for collaborative work, offering a model of organizational communication that integrates action and relationships through a set of cognitive and affective strategies. Daft and Lengel [23] set the stage for media richness theory, which has encouraged other theories and models such as to Cognitive Effect Model and media synchronicity theory.

## Foundations

Behavioral theory dates back to the 1960's, while organization theory dates back to the early 1970's. Both of these social sciences are contributors to media richness theory as introduced by Daft and Lengel [24] in 1974. "Galbraith in 1973 explained the variations in organizational form based upon the amount of information needed to reduce task related uncertainty and thereby attain an acceptable level of performance [25]." Rules from other studies have also been associated with task uncertainty.

Understanding work flow processes and behavioral tendencies within organizational work units is one area study to identify relationships between tasks and information processing. These findings were studied in relation to departmental communication and are represented as follows: "Tushman (1978), Van de Ven and Ferry (1980), Daft and Macintosh (1981), and Randolph (1978) support a positive relationship between task variety and the amount of information processes within work units. [26]" Van de Ven, Delbecq, and Koenig (1976) found that departmental communication increased as interdependence among participants increased.

Behavioral theory, organizational theory and media richness theory alike were all studied within the 1960-1980 timeframe. These social sciences were on the cusp of the major technological changes that took place in the 1980's where information availability began to soar. The knowledge and importance of communication and need for work processes was becoming evident and has created the foundation we have built upon today.

## Synthesis with Class Materials

Looking at media richness from an organizational level brings together characteristics other than that of an individual's behavior. Professional support systems (PSS), as discussed by Zwass [27], aid users in performing tasks specific to their profession. Two general categories applicable to organizational level support are: connectivity and group memory. Connectivity is a cornerstone for professionals around the world. Being connected, and obtaining information accurately and in a timely fashion, supports the need for media richness. With new devices such as laptops and PDA's working in tandem with modems or satellite, having quality information that is accurate ensures the usefulness of these smaller, less powerful devices. Typically, organization level executives and managers travel frequently, whether domestic or international. Portability cannot be effective without connectivity. This collaborative effort is necessary at the organizational level for decision-making, causing a need for readily available information. Group memory plays an important role by providing a means to store and access rapidly, in an electronic form, the new ideas and those in progress relating to the group's efforts.

The increased use of electronic documents in lieu of paper has not only become a more viable long-term solution for document storage, but also a more effective means of circulation. The increase in multimedia systems is another

reason paper documents are less effective because they eliminate components such as voice or video. Media richness theory identifies communication media with varying degrees of richness. While documents are media of low richness, they are often an effective means of communication for iterative procedures and standardized data. Offsetting tasks of low richness by other communication media enables managers to dedicate more time to decisions of high richness where face-to-face and telephone (voice and video) related activities are essential. High richness is often coupled with the expedience and criticality of time. Low richness supports communication media of a low degree of richness [28]. Zwass [29] also discusses media of low richness with respect to electronic documents. Comparing the increased use of electronic mail, hypertext and hypermedia as an extension of those low richness media. Comparatively speaking, technology has become an aid to media of low richness. "E-mail has affected structure and corporate culture in organizations where it has become a principal means of communication [30]." Also mentioned is the ability to span across managerial levels for increased effectiveness of communication.

Peppard [31], much like Zwass [32], reflects the technological changes that have resulted from media richness theory. Both respect to leveraging knowledge, groupware and electronic communications come into play. Additionally mentioned is the increased uncertainty and intricacies resulting from global markets and the critical success factors. These factors necessitate an organizational structure for decision-making based on knowledge. Addressing strategies such as synergy across business units and a need for global business processes also play an important role.

Chen [33] relates this structural design and media richness EIS systems and their focus to deliver information to executives on line. The desire to navigate through screens data in tabular or graphical form can be tedious depending on the reliability and structure of the data. Chen states "there is no underlying model to guide the navigation of the diverse data and applications used by executives. A repository based and model-driven EIS that captures integrated organization and information system (IOIS) models of an enterprise is therefore needed. [34]."

## Analysis

Structural design and organizational design, with respect to information processing and media richness, continue to be topics of discussion. The continuous changes in communication technologies challenge design structures and, by default, the impact on information needs. The objective is to know the best use for a given course of action. Having structures that define criticality, for example, will often determine which communication technology to use and, more importantly, how to use this communication technology as an iterative choice in your organizational design. The effectiveness of organizational design will outweigh the impact resulting from new technologies, enabling the organization to effectively apply these new technologies for increased performance.

Encouraging media rich information and being able to seek value from the information is an ongoing challenge. It continues to be a topic today, especially with regards to Data Warehousing and Dimensional Data Marts. As a multitude of information is brought together in these data marts, media richness is value added. Information that is not high in media richness can not only cause poor decision-making, but also can cause frustration, resulting in managers not using the information. This lack of confidence can also have repercussions such as individual managers creating their own sources, leading to data integrity issues and redundancy. This goes against the authors' belief that "one distinguishing feature of organizational information processing is sharing [35]."

Another point brought forth is the impact new electronic media has had on the media richness theory. Empirical studies have put forward a new theory called media synchronicity theory (MST), which encompasses two communication processes (conveyance and convergence) [36]. Dennis and Valacich (1999) [37] expand the set of media characteristics that can affect communication to include parallelism, reprocess ability, and rehears ability. These media characteristics have brought forth concurrent conversations supported by the medium, the ability to make messages available for reassessment at a later time, and also to allow the co-communicators to chat electronically about issues that are vague or confusing. Reprocess ability facilitates communication dialogue by enabling the communication of additional informational cues. Rehears ability encourages refinement of messages, which can contribute to clear, concise messages or adjustment of content and tone just before transmission. Also, the ability for draft revisions by colleagues is facilitated. Advances in technology by default have supported the growth of media rich information.

## **General Critique**

Meeting information requirements at the organization level requires a different emphasis than the handling information requirements at the individual or detailed task level. Organizational requirements are typically needed for collaborative decision-making. To maximize the decision-making processes, structural design is needed to ensure everyone is on the same page. Daft and Lengel build upon their media richness theory of 1984. Their emphasis on uncertainty and equivocality in this article parallels these two forces. The authors' clear and concise method of explaining these two forces support their belief in structural design. The framework compares uncertainty and equivocality, both in terms of information contingencies, and also as two forces. These two distinct aspects are then brought together as a single framework. Daft and Lengel [38] capitalize on both uncertainty and equivocality by arguing that organizational design can provide information of suitable richness. Furthermore, other articles are cited to reflect the integration effort and theories surrounding media richness theory.

Structural characteristics that focus on media richness are examples of the extensive coverage provided in the article. Seven structural mechanisms were proposed with respect to addressing uncertainty and equivocality. These seven steps were presented based on previous research. Complementary to these characteristics are the application of these mechanisms in relation to the organizational applications. The level of detail provided makes it easy to visualize each characteristic of organizational design.

## **Further Critique of a Conceptual Article**

### **Logical Consistency**

The flow of the article was logical. It repeatedly drew together the media richness theory to the importance of structural design when addressing organizational information requirements. The components did not contradict each other.

### **Coherence**

The article was coherent as a whole but some having a broader background in social sciences would be beneficial.

### **Substance**

There was ample content throughout the article and detailed components for those of particular importance such as structural characteristics. Reference to previous studies also provided substance for components of a less detailed nature but supporting the media richness theory.

### **Focus**

The focus of this article was on the importance of media richness. The emphasis was on two forces: uncertainty and equivocality. These forces were carried throughout the article and discussed in relation to structural design and organizational information requirements.

## **Issues listed by Author**

Daft and Lengel state "the concept of equivocality has not been included in most studies and models of organizational design and information processing. Bringing equivocality into future studies of organizational design may provide richer and more accurate assessments of organizational behavior [39]." The issue remaining is the ability to elaborate and test the ideas of this paper and further define the mechanics of organization structural design.

## Issues in your opinion

In a very competitive market, I believe there is a greater need for EIS systems than has been identified by management in most corporations. Too often you find senior-level management working from incomplete reports or multiple reports with missing information. The value of this information is underestimated and at times costly to their competitive edge in the market. Most organizations do capture the necessary information and use it for transaction processing, but they have difficulty identifying information that has media richness. I believe that most RDBMS systems now have the ability to feed or interface with new EIS systems and technological advances have now made it feasible and cost effective.

Another essential factor is an understanding of content and the value behind the information being provided. Having a structured design and approach can aid dramatically in bringing an understanding to the content and its value. Recognizing the components that make up good organizational structure will facilitate the interaction that ensures effective communication. Determining the type and the amount of information needed is another component that must be addressed to improve media richness.

## Impact

The nature of the article is based on theory and the introduction of new concepts in structural design. Media richness theory is still a topic today almost 20 years later but has evolved due to the technological advances in media and communications. Introductions of electronic mail, video conferences and multimedia technologies are just a few examples that reflect the need for a modified theory. Executive information systems are increasingly important and support the concepts introduced by the theory. In all certainty, media richness theory will continue to evolve as communications mediums improve.

## Questions

Why wasn't a better example of the types of information needed at the organizational level introduced?

Why weren't additional graphics provided for the structural design component?

Why do the authors suggest specific themes about organizational information processing but offer few examples of what the themes could be?

## Annotated Bibliography

1. Richard Daft and Robert H. Lengel, "Organizational Information Requirements, Media Richness and Structural Design," *The Institute of Management Sciences*, Vol. 32, No. 5: pp. 554-571, May 1986. Cite how organizations can increase media richness with structural design, reducing uncertainty and equivocality.
2. *Ibid*, p. 554. Address this question by highlighting the two forces that influence information processing in an organization: uncertainty and equivocality.
3. *Ibid*, p. 554. Quote attain an acceptable level of performance.
4. *Ibid*, p. 554. Cite that Galbraith explains that the amount of information is proportionately related to reducing task-related uncertainty and attaining an acceptable level of performance.
5. *Ibid*, p. 554. Cite that Galbraith proposes that specific structural characteristics and behaviors would be associated with information requirements.
6. *Ibid*, p. 554. Cite that studies have found that either the amount or nature of information processing is associated with task uncertainty (Meissner 1969; Gaston 1972; Bavelas 1950; Leavitt 1951; Becker and Nicholas 1969).
7. *Ibid*, p. 554. Cite that Weich's (1979) argument on reducing equivocality is a basic reason for organizing.
8. *Ibid*, p. 555. Cite that equivocality can be similar to uncertainty yet can be approached by having a structure an organization can adopt to meet its information processing requirements.

9. Ibid, p. 559. Cite that Daft and Lengel dispute this point by arguing the importance of organizational design and the results of obtaining information of suitable richness to reduce equivocality as well as provide sufficient data to reduce uncertainty.
10. Ibid, p. 568. Quote that this paper attempted to integrate equivocality with uncertainty and argue that structural characteristics are used to help organizations cope with these two factors.
11. Ibid, p. 556. Cite that that lack of clarity for an organization is a bigger problem than lack of data. To benefit organizational decision-making, delivering the right information in a structured manner is essential. Higher clarification of data will result in media richness.
12. Ibid, p. 567. Cite that integrating equivocality with uncertainty influences the information processing needs organizations require to attain adequate performance.
13. Ibid, p. 554. Cite that to encourage structural design to support both the amount and richness of information provided to managers.
14. Ibid, p. 555. These individual mechanisms, once implemented, can address an array of information processing needs such as uncertainty, task coordination and aid in an unclear environment.
15. Ibid, p. 569. Quote that how organizations scan and interpret the external environment, and how information feeds into decision making (Huber and McDaniel 1986) could also make a valuable contribution.
16. Dov Te'eni, "Review: A Cognitive\_Effective Model of Organizational Communication for Designing IT" MIS Quarterly, Vol. 25, No. 2: p. 252, June 2001. Class reading cites this article by stating that media richness theory has been influential with regards to communication complexity and information being misunderstood for non-routine situations.
17. Anne Massey, Mitzi Montoya-Weiss and Jeffrey Schmidt, "New Product Development Decision-Making Effectiveness: Comparing Individuals, Face-to-Face Teams and Virtual Teams," Decision Sciences, Volume 32 Number 4: pp. 1-26, Fall 2002. Class reading cites this article with respect to the capacity of communication media to convey cues and facilitate shared understanding in a timely manner.
18. University Twente, "Media Richness Theory", <http://www.tcw.utwente.nl/theorieenoverzicht/meso/Media%20Richness%20Theory.doc> Cite web site that Daft and Lengel were the first champions of media richness theory back in 1984, just 2 years before publishing this article.
19. Ibid, p. 556. Cite that both theories have an underlying belief that organizational structure plays an important role to ensuring effective communication within an organization itself.
20. Dov Te'eni, "Review: A Cognitive\_Effective Model of Organizational Communication for Designing IT" MIS Quarterly, Vol. 25, No. 2: p. 251, June 2001. Class reading cites this article by stating that effective means of communication is essential when dealing with today's computing technologies due to the vast amounts of information available.
21. Dov Te'eni, "Review: A Cognitive\_Effective Model of Organizational Communication for Designing IT" MIS Quarterly, Vol. 25, No. 2: p. 284, June 2001. Citing the article by stating the higher the interdependency, the higher the cognitive complexity, and the more intensive the need for managing collective action becomes. Higher interdependency is assumed in judgmental tasks, which usually imply more intensive influencing."
22. Te'eni, p. 252. Quoted from article the question thus the question for designers has become broader: how should technology be designed to make communication more effective by changing not only the medium, but also attributes of the message itself?
23. Daft and Lengel, pp. 554-571.
24. Ibid, p. 554. Cited article that both of these social sciences are contributors to media richness theory as introduced by Daft and Lengel in 1974.
25. Ibid, p. 554. Quoted that Galbraith in 1973 explained the variations in organizational form based upon the amount of information needed to reduce task related uncertainty and thereby attain an acceptable level of performance.
26. Ibid, p. 554. Quoted that Tushman (1978), Van de Ven and Ferry (1980), Daft and Macintosh (1981), and Randolph (1978) support a positive relationship between task variety and the amount of information processes within work units.
27. Vladimir Zwass, "Foundations of Information Systems," Boston: Irwin McGraw-Hill: p. 41, 2001. Citing that PSS aid users in performing tasks specific to their profession.
28. Daft and Lengel, p. 560. Low richness supports communication media of a low degree of richness.
29. Zwass, p. 295 Cited article about comparing the increased use of electronic mail, hypertext and hypermedia as an extension of those low richness media.

30. Ibid, p. 303. Quote that e-mail has affected structure and corporate culture in organizations where it has become a principal means of communication.
31. Joe Peppard, "Information management in the global enterprise: an organizing framework" *European Journal of Information Systems*: pp77-93, 1999. Cited from article the increased uncertainty and complexity resulting from international competition makes co-ordination a critical success factor.
32. Zwass, p. 295. State that his theories are similar to Daft and Lengel.
33. Minder Chen, "A Model Driven Approach to Accessing Managerial Information: The Development of a Repository-Based Executive Information System," *Journal of Management Information Systems*, Vol. 11, No. 4: p.33, Spring 1995. Cited article that Chen relates this structural design and media richness EIS systems and their focus to deliver information to executives on line.
34. Ibid, p. 33. Quoted from article that there is no underlying model to guide the navigation of the diverse data and applications used by executives. A repository based and model-driven EIS that captures integrated organization and information system (IOIS) models of an enterprise is therefore needed.
35. Daft and Lengel, p. 556. Quote that one distinguishing feature of organizational information processing is sharing.
36. Kohala Coast, Michael Morris, Cheri Speier and Joseph S. Valacich, "Beyond Media Richness: An Empirical Test of Media Synchronicity Theory," January 06 - 09, 1998: <http://csdl.computer.org/comp/proceedings/hicss/1998/8233/00/82330048abs.htm>. Cited the introduction of media synchronicity theory (MST), which encompasses two communication processes (conveyance and convergence).
37. Ibid. Cited that Dennis and Valacich (1999) expand the set of media characteristics that can affect communication to include parallelism, reprocess ability, and rehears ability.
38. Daft and Lengel, p. 559. Cited that the article capitalizes on both uncertainty and equivocality by arguing that organizational design can provide information of suitable richness.
39. Ibid, p. 569. Quoted the concept of equivocality has not been included in most studies and models of organizational design and information processing. Bringing equivocality into future studies of organizational design may provide richer and more accurate assessments of organizational behavior.

## Citation Analysis Appendix:

### Citations found in the ACM Index:

A total of 62 citations were found in the ACM Index. Twenty are identified below.

1. Mathew J. Kelmpa "Management of Information Technology innovation: A Heuristic Contingency Paradigm Research Perspective" Special Interest Group on Computer Personnel Research Annual Conference, ACM Press: pp. 56-75, 1993.
2. Angela Graveline, Cheryl Geisler, Michael Danchak "Design Collaboration and Mediating Technologies: Teaming Together Apart: Emergent Patterns of Media Use in Collaboration at a Distance" ACM Special Interest Group for Design of Communications, IEEE Educational Activities Department: pp. 381-393, 2000.
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19. Robert S. Fish, Robert E. Kraut, Robert W. Root, Ronald E. Rice "Evaluating Video as a Technology for Informal Communication" Conference on Human Factors in Computing Systems, ACM Press: pp. 37-48, 1992.
20. Robert E. Kraut, Ronald E. Rice, Colleen Cool, Robert S. Fish "Life and Death of New Technology: Task, Utility and Social Influences on the Use of a Communication Medium," Computer Supported Cooperative Work, ACM Press: pp. 13-21, 1994.

### Citations found on the World Wide Web:

A total of 9 citations were found on the World Wide Web. Three are identified below.

1. University Twente, "Media Richness Theory", <http://www.tcw.utwente.nl/theorieenoverzicht/meso/Media%20Richness%20Theory.doc> Cite web site that Daft and Lengel were the first champions of media richness theory back in 1984, just 2 years before publishing this article.
2. Kohala Coast, Michael Morris, Cheri Speier and Joseph S. Valacich, "Beyond Media Richness: An Empirical Test of Media Synchronicity Theory," January 06 - 09, 1998: <http://csdl.computer.org/comp/proceedings/hicss/1998/8233/00/82330048abs.htm>.
3. Brian Newberry "Media Richness, Social Presence and Technology Supported Communication Activities in Education" [http://learnngen.org/resources/module/lgend101\\_norm1/200/210/211\\_3.html](http://learnngen.org/resources/module/lgend101_norm1/200/210/211_3.html)

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1. Richard Daft and Robert H. Lengel, "Organizational Information Requirements, Media Richness and Structural Design," The Institute of Management Sciences, Vol. 32, No. 5: pp. 554-571, May 1986.
2. Ibid, p. 554.
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13. Ibid, p. 554.
14. Ibid, p. 555.
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