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Towards an Epistemological Definition of the Research Front of Information and Society

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Abstract: Defining information and society is similar to defining the weather in many regards. The vastness, ambiguity and rapid change of these definitions are what make them comparable. We now live in a society dominated by information, and information technology. Never before has so much been required of the human being (Ellul, p. 320). One approach to defining the current state of information and society is to use the scholarly approach of defining the research front. The goal of defining the research front in information and society is to provide a perspective on classical philosophies, and are they still valid? This purpose of this research is to define current contributors to the field of information and society, classify what topics are being researched and discuss the current trends. All these elements of research will use history as their backdrop. It is also important to discover if fundamental social and cultural issues are now being changed based on information and technology. The artifacts reviewed for this study will be documents retrieved from peer-reviewed journals, since peer reviewed information is the corner stone of scholarly research. The deeper you delve into the history of any topic, the more you begin to see the connections between the ideas, people, and institutions captured in the archives (Small, 2003). Since information studies are a discipline rich in history and research, it is necessary to implement this kind of depth. In building the research methodology, the starting point will be to construct a bibliography from a database based on a search by keywords, cited authors, cited papers or books, or by a source journal (Garfield, Pudovkin and Istomin, 2003). Other studies defining research fronts have also used this step and initial point of the methodology (Virgona, 2003). Forty-four documents were retrieved from the scholarly database that met the selection criteria. The years 1998 and 2001 provided significant contribution to the population of articles, 20% and 22% respectively. When the journals were categorized by the search areas, half of the articles were from the field of economics. At a high level, the research front for information and society over the last eight years can be broadly defined from the data collected from this study. Although no particular year or author dominated the epistemological research front, research was strongly skewed towards economics, with other fields contributing a sprinkling of research. Philosophy of Information and Society research closely followed the trend of the overall field of information and society. The research was authored by no central contributor and presented 32 unique keywords, dominated by the economics and microeconomics research. Philosophical questions surrounding government's role in information and society were also discussed in the research. Research of history, as it relates to information and society, is not a major focus area. For the research that was conducted, some clustering around the archives keyword occurred. Contemporary research into the economics of information and society was wide

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and varied, and addressed relevant subject matter. Confidence in corporate information used for investment purposes is a critical worldwide concern. Economics and the relationship to a culture or personal values were questioned by several authors. Advances in information, communications and transport technology largely define how society's, institutions and organizations relate to place and space. Social and political aspects of information and society, by any measure, were a minor contributor to the knowledge base. The research front was varied and dispersed over many disciplines. No central author was found in the field in general, and after extracting anomalies and outliers, no contributor dominated the sub-disciplines. Using the data collected, two subsequent studies can be performed: (1) Perform a co-citation analysis of the collected articles to further defined at a more granular level contributors to the fields and (2) Review the journals that contributed to this research to locate a dominate publisher in the field. Although the research conducted was clearly grounded in existing theory, it did not investigate some timely issues previously raised by their predecessors. For example, Moore's Law, which states computer power would double every 18 months and how controlling information flow has quickly become an issue (Brown and Duguid, 2002). Also topical and growing in public concern is information privacy. To quote Scott McNeally: "You already have zero privacy, get over it" (Castells, 2003, p. 173).

Key words: informatics; research front; history; philosophy

JEL codes: O3, O33, N0, N01

1. Introduction

Why does anyone care about the weather? The weather changes from season to season, weekly, daily, even hourly. There is nothing that can be done to control the weather, so why be concerned? Defining the atmospheric conditions is analogous to driving a stake in the ocean. The weather differs from location to location, has a different impact from one person to another, and is so vast and transient that no one definition is sufficient. However, people do care about weather conditions. Decisions need to be made on a daily basis concerning clothing, travel, safety, and scheduling.

Defining information and society is similar to defining the weather in many regards. It is a vast, difficult to define term that changes rapidly. So why would one want to define the current state of information and society? For the same rationale a person wants to know the daily temperature in his or her town. We now live in a society dominated by information, and information technology. Never before has so much been required of the human being (Ellul, p. 320). The Information Society concept dates back to Fritz Machlup 1962 (Beninger, p. 21). With the diffusion of the Internet innovation, geographical boundaries are all but eliminated. Knowing how and where to get accurate information in a timely manner is critical in the new information society. Information abounds today, and knowing what that means is important. Information has now become so intertwined with technology, the terms and concepts are no longer independent. The promise of technology was one of liberty and prosperity (Borgmann, 1984, p. 246). In many respects, the fundamental cultural changes caused by the information society (and technology) are paralleled by the social revolution in European history which saw book learning (previously assigned to old men and monks) gradually become the focus of daily life during childhood, adolescence and early manhood. It also widened the gap between literate and oral cultures in a manner that placed the well-read adult at an increasing distance from the unschooled small child (Eisenstein, 1979, p. 432).

One approach to defining the current state of information and society is to use the scholarly approach of defining the research front. This concept depends on the science of abstract impersonal order: counting,

measurement, and exact notation (Mumford, 1967, p. 173). Factor and co-citation analysis are common and time-tested measures in defining the research front. Co-citation analysis shows that literature joins and changes in intelligible ways over time, whether one defines them in terms of individual articles and books, or journals (White and McCain, 1998).

Another benefit of defining the research front in information and society is to provide a perspective on classical philosophies, prove whether or not they are still valid? Is the concept of computers directing work or not doing work or themselves obsolete (Bolter, 1984, p. 8)? Computers in Detroit are now manufacturing cars, Wall Street systems are automatically making payments, etc., and all this is happening without human intervention. Even innocuous statements, post September 11th, 2001 may bring into question an entire philosophers' body of work. For example, Cassels does not see the warning signs and believes the United States government fears of vulnerability are somewhat over blown (Cassels, 2003, p. 159).

This purpose of this research is to define current contributors to the field of information and society, classify what topics are being researched and discuss the current trends. All of these elements of research will use history as the backdrop. It is also important to discover if fundamental social and cultural issues are now being changed based on information and technology? Centuries, or even decades ago, death was death. Due to the advances in information and technology, surrogates can decide on death of another human being (Ihde, p. 180).

2. Problem Statement

The primary objective of this research is to contribute more definition to the information and society research front by analysis of citations and keywords. Since information and society is such a large discipline, is it even possible to define the research front? If so, what are the benefits? Comparisons of annual scholarly "maps" show low-level changes within locations of major disciplines that contribute to the larger understanding of a field (Small, 2003). Citation data itself provides a unique mechanism for establishing consensual sensors (Small, 2003). These reviews and studies show key contributors to the discipline and demonstrate which directions the research is focused on. By documenting the authors and subject areas, the research front moves away from tacit knowledge. Tacit knowledge, which is the kind of knowledge we deploy in being able to ride a bike without being able to say precisely how it is that we do so, is often important to the successful design of technologies, it is not however, useful in defining scholarly disciplines (Mackenzie, p. 425).

The artifacts reviewed for this study will be documents retrieved from peer-reviewed journals. Since peer reviewed information is the corner stone of scholarly research. An important part of the process of the evaluation of academic information is the anonymous peer review of articles. This practice is regarded by many as a key to ensuring the quality of academic information (Madden, 2000).

Defining the research from of information and society is in no way to be considered original research. Similar or derivates of this research have been conducted in the past. This effort should be considered a contribution to the larger landscape of the research front, rather than a definition of the research front. Specifically, areas of economics, social and political aspects, philosophy and historical disciplines of information and society will be investigated. For semester time considerations, and experience of the research team, results should be considered in that context.

3. Background Literature and History

The deeper you delve into the history of any topic, the more you begin to see the connections between the ideas, people, and institutions captured in the archives (Small, 2003). Information studies is a discipline rich in history and research. McCain, White, Price, Garfield, Small, and others have laid a phenomenal groundwork for future research. Studies of writer's contributions to defining the field have been numerous, possibly highlighted by the 1995 White and McCain research. In that study, names of those most frequently cited contributions in 12 key journals from 1972 through 1995 were retrieved from Social Scisearch via Dialog (White and McCain, 1995). Based on the data, a research front was defined. That study presented an extensive domain analysis of a discipline—information science—in terms of its authors.

At this juncture a distinction needs to be stated. This study will focus on authors and keyword information from scholarly search engines. The retrievalists generally bring highly formal and computational skills to problems of designing and evaluating experimental systems for document retrieval. Citationists analyze properties of the scientific and scholarly literatures from which documents are retrieved (White, 2003). The researchers in this study will be focusing on the citationists' role.

4. Sampling of Research Front Articles Using Citation Techniques

Defining a research front is a common scholarly effort, and in is no way unique to the field of information science. Other disciplines also perform similar research, extracting knowledge and benefits from their efforts contributing to the epistemology of their fields. The following section is a sampling of research front studies in assorted disciplines.

Osif (2000) measured what types of document formats (journals, books, reports, etc.) were utilized in the field of transportation. The researchers believed benefits of this effort would be reduced costs, quick implementation, timesavings, and more effective decision-making and support management. The results can be summarized as follows:

Table 1 Field of Transportation Document Formats

Format	1996 study (TRANSPORT) (%)
Journals	22.2
Books / conferences	41.7
Reports	35.7
Theses	0.4

In a similar "format" type study, the Ching and Chennupati (2002) study revealed a general preference for books over journals, which is reflected in the small number of citations to journals in university libraries. Even though the library subscribed to and circulated approximately 300 journals to their staff, it was necessary to re-visit its policy with regards to journal subscriptions and further investigate their usage. Another study using format reviews was the Sylvia (1998) research, where bibliographic citation analysis of student research papers was used to evaluate the use of a university journal collection.

The business field also utilized the use of research fronts. Pilkington and Liston-Heyes (1999) studied the research agenda of European production and operations management (POM) scholars. Their findings showed

substantial differences from that of their North American counterparts, and argue that such transatlantic differences may have exacerbated the difficulties POM has experienced in developing as a respected academia discipline. Academic pressure to publish in established places has much to do with this phenomenon. Also in the business domain, specifically marketing, Jaffe (1997) researched the leading authors in international marketing as cited in textbooks. The study determined a major reason why international marketing has not advanced much beyond descriptive and pragmatic research; it is due to both the need to solve immediate business problems on the part of practitioners and a need for "safe", publishable research on the part of academicians.

Various forms of research front's methodologies are in use across the academic world, and are not exclusive to the field of information science. Rich in history and deeply rooted in scholarship, citations analysis and definition of the research front is a valuable tool to academia. Don Swanson has written a very persuasive essay on the analysis of scientific literature to assist in problem solving. This is a good example of how information science methods might be used to directly contribute plausible scientific hypothesis to be tested in the laboratory (Small and Garfield, 1989).

5. Definitions

At this juncture, is important to define some key terms and phrases. As with many methodologies, research fronts have a vocabulary unto itself. It should also be noted that an unsuccessful attempt was made to define 'peer review journals' for this study. A clear and concise definition was not available.

Table 2 Key Terms and Definitions

Term	Source	Definition
Bibliometrics	White and McCain 1998	Mathematically modeling certain regularities in textual or bibliographic statistical distributions.
Chained Indexing	Garfield, Pudovkin and Istomin, 2003	Retrieved papers in a search are used to further expand the file.
Citation analysis	White and McCain, 1998	Focuses on the interconnectedness of scientific and scholarly literatures, usually from ISI.
Emerging research front	Small, 2003	An "emerging research front" is a cluster consistently of highly cited papers that did not appear in any front in the prior period.
Factor analysis	White and McCain, 1998	Factor analysis: shows an authors contribution to more than one specialty.
Fast moving fronts	Small, 2003	Clusters having a rapid rate of increase in the number of highly cited papers they contain.
Inertia of a field	White and McCain, 1998	Objectively captures the slow-changing divisions on which one's subjective sense of "semi-permanent" disciplinary structure rests.
Information	Cummins, 2002	Data are assembled, aggregated, organized and presented so that they reveal relationships, trends and exceptions. These features are abstractions of the detail that present concepts and relationships, that is, information not obvious from the raw data.
Library and Information Science	White and McCain, 1998	Broadly speaking, this field concerns itself with modeling the world of publications with a practical goal of being able to deliver their content to inquirers on demand.
Map of science	Small, 1999	A map of science is a spatial representation of how disciplines, fields, specialties, and individual or authors are related to one another as shown by their physical proximity and relative locations.
Stability Index	Small, 2003	Stability Index is the number of continuing highly cited papers divided by the size of the union of the prior and subsequent fronts.

6. Research Methodology

Selecting a research methodology to define the research front for information and science can be derived from previous studies. Many of the studies, such as White and McCain (1995), specifically state in the research that the theory and methodology are sufficiently detailed to be usable by other researchers. Additionally, many of the pitfalls have also been documented for future researchers. Some of the problems with citation analysis are (Sylvia, 1998):

- The author of a paper may not cite all the works actually used in its preparation.
- The author may cite materials that contributed marginally, if at all, to the research.
- Citing the Boyce and Banning 1996 report:
  (a) 13.6% of citations in the Journal of the American Society for Information Science contained inaccuracies.
  (b) 10.7% of citations in the Personnel and Guidance Journal contained inaccuracies.

Since this research will be required to perform a database search, the researchers are keenly aware of keyword search issues, but natural language searches have been successful used in the past (Garfield, Pudovkin and Istomin, 2003). Scope is a serious concern when addressing a large topic during a shortened time frame. Rather than aiming for total inclusiveness, the more limited objective of mapping highly cited literature over a broad range of disciplines is a more realistic goal in the short run (Small, 1999). For this reason, the specific aspects of information and society reviewed will be Philosophy, History, Social and Political and Economics. The purpose of concentrating on a well-defined area is to make the subject manageable (Clanchy, p. 5). As stated by Small (2003), the goal is to complete a project before one retires.

In building the research methodology, the starting point will be to construct a bibliography from a database based on a search by keywords, cited authors, cited papers or books, or by a source journal (Garfield, Pudovkin and Istomin, 2003). Other studies defining research fronts have also used this step and initial point of the methodology (Virgona, 2003). Using this as a basis for the research, the methodology is as follows:

Table 3 Research Methodology

Task	Description	Result
1	Tool Identification	
	Internet Browser	Microsoft Internet Explorer using a corporate (Citigroup) proxy server.
	Data Collection	Microsoft Excel
	Word Processing	Microsoft Word
	Citation Database	Emerald will be the primary search tool, selected for breadth of journals. It is known that Ingenta is a viable scholarly data repository, and in the event that Emerald is unavailable during the research period, Ingenta will be used. The purpose of concentrating on one topic is to make the subject manageable. See appendix A and B for the list of Journals.
2	Search Parameters	
	Identification of search terms	"History of Information and Society" "Philosophy Information and Society" "Economics of Information and Society" "Social and Political aspects Information and Society" Ingenta and Emerald both allow for single/multiple term entry, which searches keywords, titles, authors, etc. See appendix C and D for user interface screen.
	Years: In our study, we use an 8-year cluster of documents to examine the development of the field.	Both Ingenta and Emerald allow for date selection. The purpose of concentrating on a well-defined period is to make the subject manageable. An eight-year window allows for recent research and will show trends and patterns.

(to be continued)

Task	Description	Result
3	Execution of citation database searches	Conducted during month of October 2003.
4	Retrieval of relevant works	Every returned item was analyzed for any relevance to the search term.
5	Citation Analysis	Each work will be reviewed and entered into an Excel spreadsheet. Each article and author will be entered on a unique row. For citations with multiple authors, each author will be entered on a separate row in the data collection spreadsheet.
6	Keyword Analysis	Each work will be reviewed and entered into an Excel spreadsheet. Each article and Keyword will be entered on a unique row. For citations with multiple keywords, each author will be entered on a separate row.
7	Date Analysis	Each article and year will be entered on a unique row in the data collection spreadsheet.
8	Research Findings	Using Microsoft Excel's pivot table functionality, statistical metrics will be compiled by author, keyword, and year. Relationships between these key indicators will be reviewed for trends and relationships.

Table 4 Research Risk Identification

Description	Risk	Mitigation
Identification of keywords	Search terms may not retrieve the desired article. Interdisciplinary and cross over fields are frequently encountered and the keyword can occasionally defy its disciplinary origins (Small, 1999).	The search terms selected are broad and clear. The number of articles not catalogued under these terms, but are nevertheless relevant, are expected to be minimal. If an article has not provided keywords, the search term will be applied as the keyword (i.e.: Philosophy).
Retrieval of relevant works	A retrieved work may be omitted.	A "liberal" selection criteria will be used, including any work which is relevent to the selected terms.
Retrieval of relevant works	Physical article may not be available.	In the event the article is not physically accessible, the on-line abstract will be used.
Scholarly database not available	Unable to perform retrieval of documentation.	In the event Emerald Insight is not available on a day that retrieval is scheduled to be performed, Ingenta will be used as a substitute scholarly search engine.
Citation and keyword analysis	Intensely manual process and subject to human error.	After each article has been entered into the database, an independent person will review the data.

7. Research Findings

Forty-four documents were retrieved from the scholarly database that met the selection criteria. The years 1998 and 2001 provided significant contribution to the population of articles, 20% and 22% respectively. The yearly distribution is detailed in the table below.

Table 5 Document Distribution by Year

Year	Total	%
1995	1	2.3%
1996	7	15.9%
1997	2	4.5%
1998	9	20.5%
1999	4	9.1%
2000	1	2.3%
2001	10	22.7%
2002	3	6.8%
2003	7	15.9%
Grand Total	44	100.0%

When the journals were categorized by the search areas, half of the articles were from the field of economics. The distribution by each field is detailed in the table below:

Table 6 Document Distribution by Field

Field	Total	%
Economics	22	50.0%
History	8	18.2%
Philosophy	12	27.3%
Social / Political	2	4.5%
Grand Total	44	100.0%

When reviewing the actual contributing authors to the forty-four articles, there was a total of 72 separate authors. Amazingly, only three were cited in more than one article; Leslie Armour and Randall C. Jimerson who was authored 2 articles each and Anghel N. Rugina who authored 9 articles. In a research anomaly, Rugina contributed 9 articles that were retrieved on three different search areas: History, Economics and Philosophy. All articles were published in the same journal and issue. The findings indicate a lack of a strong central author, which is somewhat contradictory to the theory that author citation data is highly skewed (White, 2003).

Subject areas in which authors are contributing to Information and society did show a strong trend towards economics. One hundred six unique keywords were identified in the forty-four reviewed documents. Economics was used as a keyword 33 times, and macroeconomics was cited 26 times. A complete cataloging of all keywords, by subject area can be located in Appendix E of this document. Below is a table of keywords cited multiple times in this study.

Table 7 Keywords with Multiple Citations

Keyword	Total
Economics	33
Macroeconomics	26
Information Technology	6
Philosophy	5
Society	5
Information Systems	4
Communications industries	3
Information Superhighway	3
Sustainability	3
Advertising	2
Archives	2
Distance Learning	2
Internet	2
Model	2
Probabilistic	2
Social Economics	2
Telecommunications	2

At a high level, the research front for information and society over the last eight years can be broadly defined from the data collected from this study. No particular year or author dominated the epistemological research front. Research was strongly skewed towards economics, with other fields contributing a sprinkling of research. The next four sections review the questions raised by the specific research areas.

7.1 Philosophy

Philosophy of Information and Society research closely followed the trend of the overall field of information and society. The research was authored by no central contributor and presented 32 unique keywords, dominated by the economics and microeconomics research.

Rugina (1998) discussed, in a series of articles, the lack of economic theory and other scholarly shortcomings. If social economics is to become a discipline, then it should possess all the attributes of a discipline, particularly vocabulary, concepts, and methodology.

Specifically, there are two basic problems in the monetary and financial environments of today. First, there is no adequate, reliable and objective instrument to measure the exact time of implementation with a monetary and/or fiscal policy. Because of this, researchers are forced to wait until a large part, if not the entire, economic and financial environment is contaminated with bugs. This problematic practice has its roots in a faulty or insufficient analysis. A recent analyst in the field of economic philosophy, Mrs. Carol L. Anderson, arrived at the conclusion that the seriousness of contemporary economic dilemmas begs for a new approach, a revised understanding, and openness to alternatives (Rugina, 1998). Rugina continues to question the social sciences, which are associated with values, and are consequently inclined to use value-loaded terms and assumptions. The only thing that is good without qualification or restriction is good will. The inclination toward truth, which is innate in our mind, is not only psychological and epistemological, it is also an ethical principle and a moral requirement. We have the duty of seeking truth and, insofar as we can, of respecting it and conforming our actions to it (Rugina, 1998).

Philosophical questions surrounding government's role in information and society were also discussed in the research. To meet the future management challenges, governments must fundamentally re-examine their approaches to administrative policy (Paton, Richard, Dodge, Christiane, 1995). In most governments, administrative policies, such as contracting, procurement, information technology, land and internal government services, are often dominated by management philosophies inherited from the 1960s and 1970s. Governments today cannot afford administrative policies that do not balance the need for spending with service delivery and innovation (Paton, Richard, Dodge, Christiane, 1995). As a result, governments are employing modern information and communication technologies to serve society better (Stamoulis D., Gouscos D., Georgiadis P., Martakos D., 2001). Raising the effectiveness and quality of government services is not only a matter of new technologies, it also involves clear vision with objectives as well as sound business stategies. One example is the ongoing development of the Greek Ministry of Finance e-services, which follows business logic. A key factor of all of these types of changes is the re-orientation of information systems for customer-orientated service (Stamoulis D., Gouscos D.,Georgiadis P., Martakos D., 2001). Another example is the Federal Government in Canada, which found that its administrative policies were a major impediment to more efficient, service-oriented and innovative government. The Government of Canada recognized the need for a dramatic change in its philosophy and approach to administrative policies, and accomplished those changes over a five-year period of phased implementation between 1988 and 1993 (Paton, Richard, Dodge, Christiane, 1995). Singapore has initiated fundamental changes in the educational system to meet the challenges of the knowledge-based economy (Kuo Eddie C. Y., Low Linda, 2001). It can be deducted from the research that the stakeholder philosophy to government will become paramount in the future (Korac-Kakabadse, Nada, Kakabadse, Andrew, 2001).

Although a minor contributor to philosophy of information and society, librarianship was cited for requiring change and grasping the philosophical underpinnings of the current socio-cultural environment (Harris, Michael,

Hannah Stan A., Harris Pamela C., 1999).

Noticeable by its high profile as a political subject, but lacking in philosophical research was information ethics, specifically relating to technology. Society's increased surveillance needs are accelerating the spread of biometric security solutions (new authentication and identification technologies based on individual physical characteristics). The research indicates two opposing lines of argument regarding the question of whether biometrics are a threat to privacy or not (van der Ploeg, Irma, 2003). “Technology is central to our present well being and vital for our future survival. As such it needs a coherent worldview, a conceptual framework that will enable the fundamental problems that it poses for society to be approached in an illuminating way” (MacFarlane, Alistair G. J., 2003).

7.2 History

Research of history, as it relates to information and society, is not a major focus area. For the research that was conducted, some clustering around the archives keyword occurred. Jimerson contributed two articles. The first of which discussed curriculum changes at Western Washington University, suggesting linking history and archives (Jimerson, 200). The second contribution discussed cognitive aspects of memory, where historical memory is built upon a foundation of archival memory (documents) and personal memory (eyewitness testimony) (Jimerson, 2003). Other research relating to archives discussed the benefits of OSI and OSINT. Open Source Information (OSI) and Open Source Intelligence (OSINT) offer the prospect of delivering valuable intelligence from so-called open sources such as newspapers, experts and on-line databases. They are completely dependent on the researcher’s understanding of the target counties history, politics and society (Yates, Zvegintzovi, 1999).

Rowland and Rubbert (2001) trace the history of adult education within the wider framework of educational change in the information society. In the spirit of full research disclosure, the Rowland and Rubbert research was sponsored by Ingenta, a resource listed in the methodology as a potential repository for the retrieval of scholarly research. Other questions being addressed in the current research includes the history of the measurement on human capital (HRA). HRA is the process of identifying, measuring, and communicating information about human resources to facilitate effective management within an organization (Gebauer, 2001). Lastly, a scientific historical review of the media was determined to be one of the driving forces of environmental information (Dispensa and Brulle, 2003).

7.3 Economics

Contemporary research into the economics of information and society was wide and varied, and addressed relevant subject matter. No topic of economic research would be complete without the mention of technology. The microprocessor and digital technologies have spawned an economic revolution enabling the global customization of mass production and services in close synchronization with the automation of consumer processes. An important outcome of this revolution is the embedding of educational processes within commercial transactions before the sale and following delivery. These new processes demand that business and education work collaboratively in the new digital environment of highly interactive entrepreneurial and intrapreneurial commerce (Cooper, 1997).

Confidence in corporate information used for investment purposes is a critical worldwide concern. In a capitalist system, an annual report that includes a financial statement is assumed to provide sound information concerning a given company (Harahap, 2003). The annual report offers a background to a company, its financial position, operational results, and its performance. According to radical economics, a financial statement serves the interests of capitalists. Current trends in accounting have raised some questions concerning the paradigm of

traditional accounting theory and its bias concerning capitalist interests. The emergence of Employee Reporting, Value Added Accounting, Socio-Economic Accounting, and Environmental Accounting, to name just a few, is proof of the shortcomings of the accounting system in establishing both just and fair principles among company stakeholders. This has led to a demand for a new approach towards accounting disclosure, including a clear account of how a company treats its employees, society, the environment, and the beliefs of employees (Harahap, 2003). Corporate provided data is critical for society's decision process. Information flows and decision making are so closely bound together that they can be treated as part and parcel of the same process. In the long-standing debate on the advantages and disadvantages of (de)centralization of decision making, local knowledge and co-ordination, have been stressed as important factors affecting the quality of decisions (Haddad, 1996). The important point is that information needs to be interpreted in order to be given meaning. The meaning that people assign to the information they receive depends on their past experience. This perspective allows a perception of humans in economics, which combines reason, adaptation and volition (Dolfsma, 2002).

Economics and the relationship to a culture or personal values were questioned by several authors. In a society where property or materialistic values are the main yardsticks by which an individual's position is measured, services have become undervalued (Spithoven A. H. G. M., 2000). Marx had expressed concern over these issues, with the observation that the capitalist world presents itself not as a world of ideas but as "an enormous collection of commodities" (Mitcham, 1994, p. 81). One reason for the lack of information regarding wealth is that wealth is not perceived as very important compared to income. Income is generally viewed as a more important basis for measuring welfare because it provides the basic purchasing power for maintaining a standard of living (Reeves and O'Sullivan, 1996). Although most of the research was at the macro level, a study was conducted focusing on the micro level, or the family unit. The study addressed two questions; first, how can the family be viewed within economic activity and second, why are the breakdown of the family and policies that encourage this breakdown incompatible with sustainable real economic development (Aguirre, 2001)?

Advances in information, communications and transport technology largely define how society's institutions and organizations relate to place and space. The thrust of economic advance is primarily driven by these technological advances (Roulac, 1996). The evolution of working and the development of the information society, and the affect on the development of cities, and whether these developments based on the new information and communication technologies (ICTs) will make cities more or less "sustainable". Government's influence on these changes is limited more by external constraints than by their own vision or competence (Lake, 1996). Few appreciate the daunting implications of the innovation forces on the existing environment than the real estate sector that provides services to support society's relationships. Real estate and information share a long history of interdependency. Information technology has had, and will continue to have, a dominant influence on the real estate sector and urban planning. For example, the use of information technologies in the area of urban road transport, namely, car pooling, dynamic route choice, extended public transport, and a dual-mode system can lead to continued and sustainable city development (Hoejer, 1996).

7.4 Social and Political Aspects

Social and political aspects of information and society, by any measure, were a minor contributor to the knowledge base. Only two articles were retrieved specifically for this area, one each from Armour and Johnson. Rugina researched a program applied in the study of politics: the two basic revolutions in political thinking, the classical school of thinking in terms of perfection or stable equilibrium, and the modern school of thinking in terms of imperfection or deviations from perfection, that is, disequilibrium, partial or total. These two schools of

thought have been presented as being contradictory, as if one were true and the other false, depending on whether a liberal or a conservative analyst does the interpretation (Rugina, 1998). Although this article was classified as “economic” in nature, the findings are clearly political in nature and should be included in this section.

The Johnson (1999) paper pointed to:

- The challenges arising from the emergency of the “information society”.
- The high level of skills required to take full advantage of the new information and communication technologies.
- Expanding information content.
- Greater awareness of information and its potential contribution to all aspects of life.
- The social and political challenges of ensuring equality in information provision.
- The need for information professionals to have a greater commitment to user empowerment;
- A higher level of skills in facilitating the use of information.
- A more visible and effective presence in the "political" arena.

The research discusses some solutions, which have been adopted by schools of librarianship in the UK to help students acquire the necessary knowledge, skills, and enthusiasm, and some areas for development (Johnson, 1999).

Information and society, by definition, is an interdisciplinary field. Armout (2001) studied how communication and economic forces impact sales and politicians. Theorists first noticed that communication systems channeled goods and services, structured political geography, and created their own pictures of the world. Armout’s paper examines reflective consciousness and its relation to civilization. It suggests compensating forces, which make for thought and turn the ordinary aspects of life into art. The study went on to describe communications devices which act as extensions of human senses. Now communication systems try to structure our inner lives (Armout, 2001).

8. Conclusions and Discussion

As one would anticipate, defining the epistemology of information and society proved to be a difficult task. The research front was varied and dispersed over many disciplines. No central author was found in the field in general, and after extracting anomalies and outliers, no contributor dominated the sub-disciplines. Keyword analysis showed 193 separate entities, with a skewing towards economics and microeconomics. The results of this study, taken in context, can be used to contribute to longitudinal study of information and society in general. One further test to ensure the validity of this effort would be to compare these findings against previous fronts defined several years back, and ask whether the change is normal or revolutionary.

Philosophy of Information and Society research closely followed the trend of the overall field of information and society. The research was authored by no central contributor and presented 32 unique keywords, dominated by the economics and microeconomics research. Philosophical questions surrounding government’s role in information and society were also discussed in the research. Research of history, as it relates to information and society, is not a major focus area. For the research that was conducted, some clustering around the archives keyword occurred. Contemporary research into the economics of information and society was wide and varied, and addressed relevant subject matter. Confidence in corporate information used for investment purposes is a critical worldwide concern. Economics and the relationship to culture or personal values were questioned by

several authors. Advances in information, communications and transport technology largely define how society, its institutions and organizations relate to place and space. Social and political aspects of information and society, by any measure, were a minor contributor to the knowledge base.

Using the data collected, two subsequent studies can be performed: (1) Perform a co-citation analysis of the collected articles to further defined at a more granular level contributors to the fields and (2) Review the journals that contributed to this research to locate a dominate publisher in the field. The research conducted, although clearly grounded in existing theory, did not investigate some timely issues previously raised by their predecessors. For example, Moore's Law which states computer power would double every 18 months and how controlling information flow has quickly become an issue (Brown and Duguid, 2002). Also topical and growing in public concern is information privacy. To quote Scott McNeally: "You already have zero privacy, get over it" (Castells 2003, p. 173).

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Appendix

Appendix A Emerald Insight Journals

Source: Long Island University 2002

1. Aslib Proceedings
2. Collection Building
3. Industrial management and Data Systems
4. Information Management & Computer Security
5. Information Technology & People
6. Interlending and Document Supply
7. Internet Research
8. Journal of Intellectual Capital
9. Journal of Knowledge Management
10. The Learning Organization
11. Library Hi-Tech
12. Library Hi-Tech News
13. Library Management
14. Library Review
15. Logistics Information Management
16. New Library World
17. OCLC Systems and Services
18. Online Information Review
19. Performance Measurement and Metrics
20. Program: Electronic Library and Information Systems
21. Records Management Journal
22. Reference Services Review
23. Reference Reviews
24. Strategy and Leadership
25. The Bottom Line
26. The Electronic Library

Appendix B Ingenta Journals

Source: Long Island University 2002

1) Behavior and Information Technology
2) Information, Communication & Society
3) Information Development
4) Information Management Report
5) International Journal of Human-Computer Interaction
6) Journal of Information Science
7) Journal of Information Technology
8) Journal of Librarianship and Information Science
9) Medical Informatics and the Internet in Medicine
10) Mind
11) Multimedia Information and Technology
12) New Media & Society
13) Science Communication
14) The Information Society

Appendix C Keyword by Subject Area

Field	Keyword	Total
Economics	Advertising	1
	Banking	1
	Communications industries	2
	Company Reports	1
	Co-Operation	1
	Decision Making	1
	Demographics	1
	Developing Countries	1
	Disclosure	1
	Distance Learning	1
	Economics	15
	Economics of Ideas	1
	Economy	1
	Environment	1
	European Commission	1
	Family Life	1
	Green Model	1
	Incentives	1
	Incomes Policy	1
	Indonesia	1
	Information Exchange	1
	Information Modeling	1
	Information Society	1
	Information Superhighway	2
	Information Systems	1
	Information Technology	5
	Intellectual Capital	1
	Internet	1
	Islam	1
	Knowledge Creation	1
	Knowledge Management	1
	Knowledge Management Strategies	1
	Knowledge Processes	1
	Labour force	1
	Learning	1
	Learning Organizations	1
	Macroeconomics	9
	Policy	1
	Population	1
	Productivity	1
	Real Estate	1
	Republic of Ireland	1
	Self-managing teams	1
	Service industries	1
	Social Economics	2
	Society	4

(to be continued)

Field	Keyword	Total
	Standards	1
	Sustainability	3
	Taylorism	1
	Technology Transfer	1
	Telecommunications	2
	Teleworking	1
	Urban Environment	1
	Urban Road Transport	1
	Wealth	1
	Welfare	1
Economics Total		91
History	Archives	2
	Brazil	1
	Digital Libraries	1
	Distance Learning	1
	Economics	9
	Environmental Health and Safety	1
	Evaluation	1
	Global Warming	1
	History	1
	Human resource accounting	1
	Information management	1
	Information Systems	1
	Internet	1
	Macroeconomics	9
	Memory	1
	Organizations	1
	Personnel management	1
	Rail Transport	1
	Records Management	1
	Siberia	1
	Students	1
	United Kingdom	1
	USA	1
History Total		40
Philosophy	Administration	1
	Atlas	1
	Biometrics	1
	Central Government	1
	Competitiveness	1
	Control	1
	Customer Behavior	1
	Cytoarchitecture	1
	Discursive Strategies	1
	Economics	8
	Genetics	1
	Governance	1

(to be continued)

Field	Keyword	Total
	Information	1
	Information services	1
	Information Systems	1
	Information Technology	1
	Innovation	1
	Internet	1
	Library services	1
	Macroeconomics	8
	Magnetic Resonance Imaging	1
	Model	2
	Neuroanotomy	1
	Philosophy	5
	Post-industrial society	1
	Privacy	1
	Privacy enhancing technologies	1
	Probabilistic	2
	Service Quality	1
	Stakeholders	1
	Surveillance	1
	Technological determinism	1
Philosophy Total		52
Social / Political	Advertising	1
	Commnications	1
	Communications industries	1
	Economics	1
	Education	1
	Information Superhighway	1
	Information Systems	1
	Librarians	1
	Library Users	1
	Society	1
Social / Political Total		10
Grand Total		193