

# A Research Manifesto for Global Information Management

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*A growing body of knowledge is being accumulated in the area of global information management (GIM). Research in this area has grown significantly in the 1990s. Not only are established IS journals publishing an increasing amount in this area but there are now specific journals devoted to the major issues in the development, use and management of global information systems. However, much of this research has been limited to isolated survey studies, or case studies into particular aspects of GIM. This has resulted in a rather disjointed and ad-hoc development of this literature that now needs some structure to further its development. The purpose of this paper is to provide a framework for research into GIM. It is intended to be a manifesto for research in this area and a challenge to researchers to consider studying a number of potentially productive sub-areas of GIM that the framework has identified as being unstudied or under studied. This research framework builds on the general IS framework of Ives, Hamilton and Davis (1980) and surveys the GIM published literature for the past 9 years. The application of this literature to the Ives, Hamilton, Davis framework indicates where much GIM research has been conducted and where further research needs to be done.*

Research in the field of global information management (GIM) is an area of information systems research that has grown tremendously in the 1990s (Palvia, 1998). A large number of research studies have been published that have examined issues relating to the development, use and management of information systems in a global context. In general, most of these studies have either been key issues studies, (where the researcher(s) surveys IS practitioners to determine what they feel are the key issues in this area), or they have been anecdotal studies that have described a particular development of an information system (Dutta & Doz, 1995; Shore, 1996; Neuman & Zviran, 1997). A survey of the literature in this area indicates that no systematic framework is guiding GIM research. It appears that current GIM research is being driven by temporal, "hot" issues in the field and not by a

structured approach to knowledge accumulation. In our view, this seems to be leading to research that may have little enduring value, that possibly duplicates itself, and that does not stretch the boundaries of what we know.

What is needed is a general framework for research into GIM that aids in categorizing research that has already been done and that helps to identify where important research is still to be done. In a sense, this framework will be a manifesto for research into GIM. A manifesto is defined as a "statement of intentions or views" (Webster's, p. 699). In this case, this manifesto is intended to help guide GIM research and challenge GIM researchers to look at their field from a broad perspective.

The purpose of this paper is to provide such a research framework. It is appropriate at this time to propose such a

framework because enough GIM research has now been conducted and published that areas of research strength and weakness can be identified. We survey and analyze a representative sample of relevant published studies in journals which focus on the management of global information resources and apply them to the framework. The paper proceeds as follows. First, GIM is defined and a review of previous GIM frameworks is described indicating the appropriate application of those frameworks and why a broad research framework is needed. Next, the "Model for Global Information Management Research" is described and the GIM studies are assigned to the framework. Finally, the Model is discussed which highlights areas where GIM research needs to be done and provides a "call-to-action" for GIM researchers world-wide.

## GIM Research Frameworks

No formal definition of global information management could be found in the IS literature. Deans and Ricks (1991) refer to issues at the "interface of MIS and international business (p. 58)". Palvia (1997) refers to "global IT research" and describes a model to "assess the strategic impact of IT on a global organization engaged in international business (p. 230)". For this paper, we define GIM as the development, use and management of information systems in a global/international context. GIM deals with management, technological and cultural issues such as differing national communications infrastructures, differing IS quality standards, IS development in different cultures, and many others. GIM research is the rigorous and systematic study of the development, use, and operations/management of a global information system(s) in a multi-country organizational environment. At the same time, traditional GIM research includes numerous single country studies focusing on the management of the information resource in a domestic context. According to Palvia (1998a), these "first generation" studies have laid the foundation and helped define global IT. This paper has therefore included single country studies in the analysis.

Most of the published literature in GIM that provides some kind of guide to research in the field has concentrated on identifying the "key issues" in the global management of information resources (Badri, 1992; Deans & Ricks, 1991; Ives & Jarvenpaa, 1991; Watson et al., 1997; Palvia, 1998b). These publications survey various stakeholders involved in the research and practice of GIM and are useful in that they attempt to capture what these people think are the critical issues in the field.

Very few papers propose frameworks or models that will help guide comprehensive research in this area. One exception is the work of Deans & Ricks (1991), who identify key issues and develop a research model based on Nolan & Wetherbe's (1981) IS research model and Skinner's (1964) work on international dimensions. This model views research as a set of subsystems that places management information systems at the center of the set. Skinner's international dimensions (social/cultural, economic, technological, political/legal) are

over laid on this framework to show the scope of the issues involved in GIM. This model is useful in a general sense but does not appear to help in showing where previous research fits or in guiding future research.

Another exception is Palvia (1997). In this paper, a model that attempts to measure the strategic impact of IT on the global firm is proposed. This model is useful in that it identifies a number of strategic factors that should be considered in studying global IT. However, this model does not identify key areas for future research in GIM and was not developed specifically to guide comprehensive research in the field.

Other preliminary frameworks with a focus on culture might also be considered GIM research frameworks. Ein-Dor, Segev & Orgad (1993) in their model contend that culture as a variable consists of three major dimensions - economic, demographic and psycho-sociological. The authors argue that any research into global IT should consider these cultural dimensions. Nelson & Clark (1994) propose a model describing the effect of multicultural environments on IT development and use. However, both of these models are too narrow in their scope and do not provide a broad framework to guide research in GIM.

What appears to be missing at this point is an overall research model, similar to the early IS research models, which will help guide future research into GIM and help organize and categorize research previously done. According to Palvia (1998a), such a framework has yet to be developed.

## A Model for Global Information Management Research

### Ives, Hamilton & Davis General IS Research Model

The research model for GIM that is developed in this paper is based on an early IS research model described by Ives, Hamilton and Davis (1980). Palvia (1998a) argues that "for a framework to be useful and gain acceptance, it needs to be comprehensive yet parsimonious, and at the same time should have gone through some form of validation" (p.8). He further added that the framework must clearly define the dependent variable(s) and the independent variable(s). The Ives, Hamilton & Davis model (see Figure 1) meets this criteria in that it is comprehensive, has been validated by the authors, and clearly identifies variables to be researched. In addition, it provides a broad view of the IS field and has been widely cited in the IS literature.

Ives, Hamilton & Davis (1980) sought to develop a comprehensive framework for research in management information systems (MIS). They reviewed the frameworks that had guided MIS research up to that point and found them lacking. Their intent was to provide a broad enough framework so that all MIS research could be categorized within it. They used a basic systems approach to identify the major components of their model.

According to Ives, Hamilton & Davis (1980), the three categories of information systems environment (user, IS development and IS operations), information systems processes and the information systems characteristics exist within an organizational environment and an external environment. Their environmental variable group consists of five classes - external, organizational, user, IS development and IS operations. The characteristics within each class act as resources or constraints to the scope and form of each information system. These environmental classes are represented by rectangles in Figure 1. The information systems process variable group is made up of performance or outcome measures - development process, operations process and use process. These process classes are portrayed in the above figure by ellipses. The third variable group, information systems characteristics, describe the features and functionalities in the information system. This is depicted in Figure 1 as a circle. The authors provide a comprehensive description of each variable group and their classes delineated in their model.

### Global Information Management Research Model

In the global information management context, we extend Ives, Hamilton & Davis's model beyond a single system to multiple systems, with diverse users, in a global environment (see Figure 2). The external environment consists of the

political, economic and social conditions in the countries where the information systems operate. The organizational environment includes the structure, composition, management processes of the organization, or organizations, that the systems function in. The user environment consists of all the different types of users and their characteristics that would interface with the system. The IS development environment includes the characteristics of the hardware and software and people in the locations where the global systems are developed and tested. The IS operations environment consists of the network and computing infrastructures that support a global IT environment.

In terms of the global information systems process variable group, the Use process consists of measures of how diverse users use a global system. The Development process includes measures of practices and procedures used to develop information systems in possibly widely dispersed locations. The Operations process consists of measures of network and computing performance for systems that operate in many countries.

Finally, the global information systems characteristics variable group lists the functions and features of the specific global system or systems under study. These would include such characteristics as data structure, logic structure, security factors as well as other attributes.

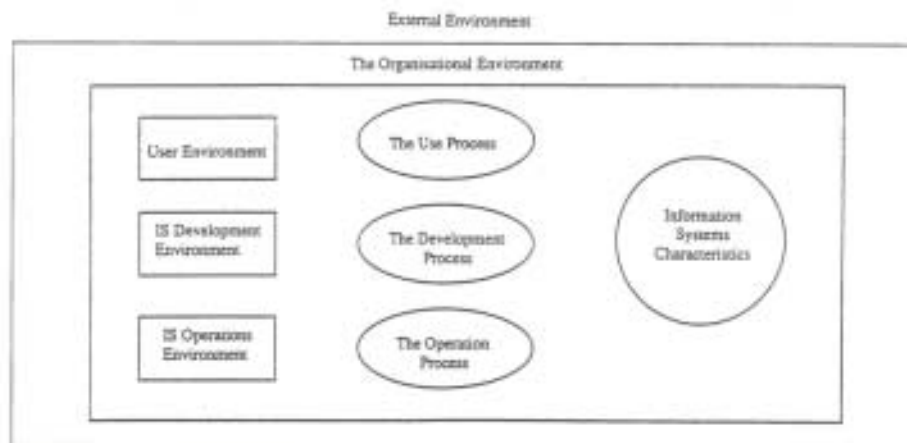


Figure 1: A Model for Information Systems Research (Ives, Hamilton & Davis, 1980)



Figure 2: A Model for Global Information Management Research (adapted Ives, Hamilton and Davis)

## Categories of Global Information Management Research

Together the three variable groups identified by Ives, Hamilton & Davis (1980), and extended in Figure 2, can provide a number of different perspectives for research in GIM. Researchers can examine one or more variables within the same variable group or between variable groups. This paper contends that GIM research can also be classified into 5 different categories as depicted in Figure 3.

Type I research involves variables within a single category - Global IS environment, Global IS processes or Global IS characteristics. An example of this category of GIM research is a study of the global IS development processes for a single company. Type II research explores the relationship between one or more variables from the process category and one or more from the environment category. An example of the type of GIM research might be a study of end user satisfaction for a system that is used in a number of countries. Type III research examines the relationship between the IS characteristics and IS process variables. An example of this research might be a case study that examines the way information is presented to users and how they use the system in a variety of countries. Type IV research investigates the relationship between environmental resources and constraints and IS characteristics. This type of research might look at the content of an EDI system and its effect on organizational planning tasks. Type V research studies the relationship between one or more variables from each of the three categories. An example of this research might be a comprehensive study of the impact of national culture on the characteristics and use of a global EIS application.

## Application of the GIM Research Model

The application of the GIM literature to the GIM re-

search model can provide for a better understanding of the state of GIM research. An analysis of a representative sample of journal publications relevant to the field was conducted. The main purposes of this analysis are to establish the types of GIM research that have been done in the past and identify the gaps in the field for future work.

### Method and Sample

The following approach was taken.

- a) A search for relevant GIM publications was the first step. It was felt that conceptual and empirical GIM research is more likely to be found in journals rather than other forms of publication such as books. Conference proceedings were not examined because it was assumed that high quality GIM research papers would be published in journals. As such the following journals were referenced:

- \* Established IS journals where GIM related research has been consistently published (ie. *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, and *Information & Management*);
- \* Niche journals which focus on publishing GIM research (ie. the *Journal of Global Information Management*, *International Information Systems*, *Journal of Strategic Information Systems*, *Journal of Global Information Technology Management*, and *Journal of International Information Management*).
- \* Regional IS journals from around the globe (ie. *European Journal of Information Systems*, *Scandinavian Journal of Information Systems*, *Australian Journal of Information Systems* and the *Asia Pacific Journal of Information Management*).
- \* Societal / Culture oriented IS journals which publish research dealing primarily with socio-economic issues and cross cultural dimensions of societies across the globe (ie. *Information Technology & People* and *The Information*

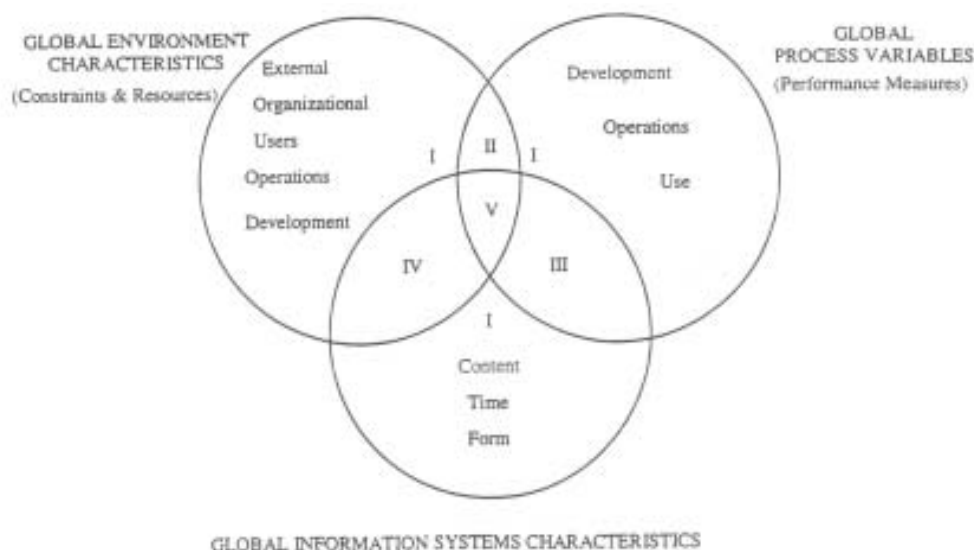


Figure 3: Five Categories of Global Information Management Research

*Society*).

An examination of these journals is expected to provide a representative sample of the research done in the field. The period covered in the analysis is 1990-1998.

- b) Based on the full text of the paper (and sometimes on the abstract if the study was clearly described), the authors independently categorized the publications into the five research categories. This was determined by identifying the variables and variable groups examined in each article.
- c) The authors also independently identified the research strategy employed in each article and categorized these.
- d) In the final step, the authors independently identified distinct GIM research themes and categorized each article accordingly.
- e) Disagreements between the authors were discussed and a classification was agreed upon.

### Results of Analysis

The search process identified 314 GIM related articles.

Research Type	Description	Count	Percent
Type I	A single variable group	257	81.8
Type II	Relationship between process and environment variable groups	46	14.6
Type III	Relationship between process and IS characteristics variable groups	6	1.9
Type IV	Relationship between environment and IS characteristics variable groups	3	1.0
Type V	Relationship between environment, process and IS characteristics variable groups	2	0.7
Total Number of Publications		314	100%

**Table 1: Number of Publications in the Five Categories of GIM Research**

These articles were categorized into the 5 types of research as summarized in Table 1. The research strategy employed was categorized using the same approach taken by Ives, Hamilton & Davis (1980). Each of the 5 research types and the types of research strategy used are described next.

### Type I research: A Single Variable Group

This category of GIM research involves variables within a single variable group - environment, process or IS characteristics. Three research sub-types can be identified:

- \* Type Ia - conceptual or methodological studies of a single variable or class of variables
- \* Type Ib - analysis of the relationship between two or more variables from the same variable group.
- \* Type Ic - conceptualization or description of the characteristics a specific information system

The 257 Type I GIM research publications can in turn be broken down to the three sub-types. Table 2 illustrates the distribution.

Research classified as Type Ia tend to be highly descriptive or prescriptive in nature. These conceptual or methodological studies do not use any dependent or independent variables nor test any hypotheses. Of the 314 publications surveyed, 184 (58.6%) can be categorized as Type Ia. Fifty seven of the 184 Type Ia publications examine variables in the external environment. These involve cultural, political, legal, economic, educational and trade variables. For example, Wan & Lu (1997) provided an overview of computer crime and related legislation in the People's Republic of China (legal environment). Robichaux & Cooper (1998) examined GSS participation in different cultural settings (cultural environment). Mehta & Darier (1998) reported on electronic governmentality in the new wired world (political environment). Dutta (1992) considered the rural coverage of telecommunication infrastructure in developing nations (economic

Variable Group	Examined	Variable Class	Examined	Type Ia	Type Ib	Type Ic
Environment		External		57	}	NA
		Organization		20	}	
		Development		23	}	
		Operations		28	}	
		User		3	}	
Process		Development		15	}	NA
		Operations		11	}	
		Use		24	}	
Characteristics		Information System		3	0	51
		Total Type I GIM Research		184	22	51
		Percent of Total Publications		58.6	7.0	16.2
		NA = Not Applicable				

**Table 2: Breakdown of Type I GIM Research**



environment). Forer, Goldstone & Tan (1998) reviewed developments in utilizing geographic information technology to create a flexible IT rich learning environment (educational environment).

Research involving variables from the development, operations and organization environment are also popular. Studies in the development environment tend to focus on comparing IS development characteristics between different countries. For example, Foley, Meyer & Sorensen (1996) compared US, Japanese and European software development practices and methods. Couger, Halttunen & Lyytinen (1991) compared the motivation environment for programmers/analysts in Finland and the US. Examples of research on operations environment include Ramanujan & Lou (1997) who discussed the issues involved in selective outsourcing of maintenance operations from an off-shore location; and Niederman (1993) who considered the issues facing information systems professionals as expatriates. Research on the organization environment is highly varied. For example, Jarvenpaa & Ives (1994) discussed the opportunities and challenges facing the global network organization of the future. Smits & van der Poel (1996) examined the practice of information strategy in six information intensive organizations in Netherlands. Pervan (1997) explored the key issues in IS management in Australasia. Mehta & Shah (1997) investigated the impact of IT on the global workforce. Slaughter & Ang (1995) compared the IS employment structures between USA and Singapore. A total of three Type Ia publications investigated variables in the user environment. An example is Ishman's (1998) on Latvian attitude toward IT.

In comparison, there is relatively little Type Ia research involving the IS process and IS characteristics variable groups. Within the process group, 24 publications can be classified as research examining the use process. For example, Lebre La Rovere (1998) explored the diffusion of IT in Brazilian small and medium-sized enterprises. Coakes & Merchant (1996) examined the use of expert system in UK businesses. Mahmood, Gemoets & Goslar (1995) reported on the use of IT in Mexico. Andersen & Kraemer (1994) compared the use of IT in the public sector in the US and Scandinavia. Harrison, Farn & Coakley (1992) compared user satisfaction with MIS across two cultures. There appears to be relatively little research investigating the development and operations process classes. According to Ives, Hamilton & Davis, development measures include participation, support and satisfaction with the development effort whilst operations measures encompass resource use, service to users and satisfaction of end users. Examples of these include: Lai & Reeh (1995), who compared ISDN implementation in the US and Germany; Cross, Earl & Sampler (1997), who reported on the transformation of the IT function at British Petroleum; and Yusof & Rahim (1994), who gave a Malaysian perspective on problems in computer-based IS development.

Of the 314 GIM publications reviewed, only 22 (7.0%) can be classified as Type Ib research. Studies in this category explore the link between two or more variables from the same variable group. There is a good mix of variables examined

with just under half focusing on the relationship between external/organizational environments and IS development/operations characteristics. For example, Dologite et al. (1997) examined the impact of organizational characteristics on IS planning, support and management in Chinese State-Owned Enterprises. Tractinsky & Jarvenpaa (1995) explored IS design decisions in global and domestic contexts. Walczuch, Singh & Palmer (1995) analyzed the cultural motivations for transborder data flow legislation.

Type Ic research conceptualizes or describes the characteristics of a specific information system. Fifty one (16.2%) of the 314 articles fall into this category. Most of the 51 articles describe the features and functionalities of a particular system in a selected country or region. For example, Lockett & Holland (1996) outlined the international payment system at Barclays Bank in the UK. Matsuda (1994) gave an account of IT in the agricultural commodity markets in Japan. Cats-Baril & Jelassi (1994) described the development of Minitel, the French national videotex system. Campbell-Kelly (1996) explored the changes in IT within the British Census.

### **Type II Research: Relationship between Process and Environment Variable Groups**

This category of GIM research explores the impact of one or more variables from the environment variable group on the process variable group measures - development, operations and use. Forty six (14.6%) of the publications analyzed can be grouped as Type II research. The emphasis of publications in this category appear to be on the relationships between the external/organizational characteristics and the use process class - 24 (52.2%) of the 46 analyzed. Most of the research studying the external environment has used cultural characteristics as the independent variable. This supports the argument by authors in the field that national culture is an important factor in GIM research (Palvia, 1998b; Nelson & Clark, 1994; Ein-Dor, Segev & Orgad, 1993). For example, Hill et al. (1998) reported on a qualitative assessment of the Arab culture and IT transfer. Marchewka & Wu (1997) explored the link between culture and IT diffusion in the People's Republic of China. Mejias et al. (1997) investigated the effects of US and Mexican culture on perceived satisfaction levels. Table 3 summarizes the 46 Type II research into the classes according to the relationships examined.

### **Type III Research: Relationship between Process and IS Characteristics Variable Groups**

This category of GIM research focuses on the influence of IS characteristics on the variable classes in the process variable group. A review of the 314 publications indicates that only 6 (2.4%) articles fall into this category. All 6 research studied the impact of IS characteristics on the use process variable. For instance, Raymond & Bergeron (1997) examined the effect of a global distribution system on the use of the technology in the travel industry in Canada and Belgium. Jansen (1995) assessed the impact of various IT projects on the

Process Group	External	Classes of Variables in Environment Organization	Development	Operations	User
Development Process	2	3	1	0	1
Operations Process	3	3	1	4	1
Use Process	14	10	1	0	2
Total Type II GIM Research = 46					

**Table 3: Breakdown of Type II GIM Research**

diffusion and use of IT in rural Norway. Peffers & Tuunainen (1998) investigated the effect of an on-line banking application on the business value of a global bank in Hong Kong. Others considered the impact of group support systems on planning effectiveness and group productivity (Splettstoesser & Splettstoesser, 1998; Aiken et al., 1994). None of the publications analyzed examined the relationship between IS characteristics and the IS development and the IS operations process classes.

#### **Type IV Research: Relationship between Environment and IS Characteristics Variable Groups**

This category of GIM research examines the relationship between environmental characteristics and IS characteristics. Only 3 (1%) of the 314 articles reviewed can be classified in this category. All three publications examined the effect of a particular type of IS on various environmental variables. For instance, Cox & Ghoneim (1996) compared the effects of EDI on seven UK industry sectors. Reekers & Smithson (1996) assessed the impact of EDI on the trading relationships between manufacturers and suppliers in the German and UK automotive industries. Jonas & Laios (1992) explored the effect of an expert system on managerial planning tasks in Greek small-to-medium sized enterprises.

#### **Type V Research: Relationship Among All Variable Groups**

This category of GIM research explores the relationships between variables from all three variable groups - environment, process and IS characteristics. Of the 314 articles analyzed, only 2 (0.7%) can be classified in this category. Both articles explored the effect of variables in the environment and IS characteristics variable groups on the use process variable. One article examined the characteristics of the Norwegian's army culture and its IT system on successful adoption of IT (Tolsby, 1998). The other investigated the fit between managerial decision tasks and types of systems and its impact on the amount of IT use between Greek and US managers (Ferratt & Vlahos, 1998).

#### **Research Strategies**

The other objective of the analysis of the 314 GIM publications is to determine the research strategies employed. This was done using the same classification scheme as Ives, Hamilton & Davis (1980). Ives, Hamilton & Davis used Van Horn's (1973) taxonomy of MIS research methods—case studies, field studies, field tests and laboratory studies. They added a “non-data” classification to refer to studies that “relied primarily on secondary sources or conceptual work (p. 927)”. We have slightly modified this classification scheme by including action research and other qualitative research strategies in the “case study” category. Field studies include both survey and interview research strategies.

Table 4 presents the breakdown of the publications by research strategies used against the five categories of GIM research types. The cells shaded dark grey represents the research strategies which have not been used in the publications surveyed. The light grey shading identifies the research strategies underemployed.

The analysis presented in Table 4 suggests that GIM research is normally undertaken with field studies (37.9%), case studies (28.7%) and non-data (32.1%) research strategies. Research strategies used in each of the GIM research categories are summarized below.

- A good number of Type Ia research is descriptive or prescriptive in nature and involves conceptual work. Non-data research strategy is the dominant approach used in these conceptual works. Empirical Type Ia studies tend to employ case studies and field studies to examine a specific variable.
- 14 out of the 22 Type Ib research use field study to explore the relationship between two or more variables from the same variable group.
- Research in Type Ic category mostly employs case study and non-data research strategies to examine the characteristics of specific information systems in domestic and global contexts.
- Field study is the preferred approach taken by Type II studies. The case study approach is also a popular strategy used to examine the link between the external/organizational environment and the IS use process.
- Type III research generally utilizes a wide range of strategies — from case study to laboratory experiments - to examine

	Research Type	Publications Count	in GIM Percent	Case Study	Field Study	Field Test	Laboratory Study	Non-Data
Type I:	A Single Variable Group							
Ia:	A Specific Variable	184	58.6	41	66	1	0	78
Ib:	Relationship between variables with a Group	22	7.0	2	14	1	0	4
Ic:	Characteristics of a Specific IS	51	16.2	28	4	0	0	18
Type II	Relationship Between Environment & Process Variable Groups	46	14.6	14	31	1	0	0
Type III	Relationship Between IS Characteristics & Process Variable Groups	6	1.9	2	2	0	1	1
Type IV	Relationship Between Environment & IS Characteristics Variable Groups	3	1.0	2	1	0	0	0
Type V	Relationship Among All Variable Groups	2	0.7	1	1	0	0	0
Total		314		90	119	3	1	101
Percent		100%	100%	28.7%	37.9%	1.0%	0.3%	32.1%

**Table 4: Research Strategies by GIM Research Types**

the effect of IS characteristics on the IS use process variable.

- Only case and field study research strategies are employed in Type IV and Type V research categories.

A large majority of the field studies are considered quantitative in nature. These are evidenced by formal propositions, quantifiable measures of variables and hypothesis testing. Qualitative field studies have also been published. For example, Hill et al. (1998) reported on a qualitative field study of the Arab culture and IT transfer. Sheffield & Gallupe (1994) used qualitative techniques to analyze the long term impacts of electronic meetings in New Zealand. The most common qualitative approach in GIM research is case study. Case study research can be positivist or interpretive (Myers, 1997). Interpretive case study as opposed to positivist does not predefine dependent and independent variables. Examples of these include, Barratt & Walsham (1995) who used an interpretive case study method to evaluate issues of culture, learning and leadership in the management of IT in a Jamaican insurance company; and Harvey (1997) who conducted an ethnographic case study of national culture differences in IT theory and practice between Germany and the US. Whereas, Dologite et. al. (1997) examined the impact of changes in the Chinese economy (independent variable) on IS planning, support and management (dependent variables) in four state-owned enterprises using a positivistic case study approach.

### Integrating the Research Model with GIM Research Themes

Although the field of GIM has a number of similarities with the study of IS as framed by Ives, Hamilton & Davis

(1980), there are a number of distinct themes which differentiate GIM research from the traditional scope of IS investigations. A content analysis of the 314 publications sampled reveal six distinct GIM research themes. Table 5 presents these themes and their description.

As part of the analysis, the 314 GIM publications surveyed are categorized into these themes. Table 6 presents the results of this analysis.

By combining the GIM Research Model with the GIM Research Themes identified, a 3- dimensional framework for GIM research can be developed (see Figure 4). The Global Information Management Research Framework is intended to highlight the main research categories, strategies and themes in the field. We contend that it is not sufficient to only consider just research categories and strategies. To ensure that the appropriate GIM issue is addressed, researchers must also reflect on a third dimension - GIM research themes. Through the 3-dimensional GIM research framework, it is possible to consider individual cells in the framework to identify potentially important research projects or areas that have been under-studied.

The remainder of this section describes the application of this 3-dimensional GIM research framework where all three aspects of research category, strategy and theme are integrated.

Single country 'domestic' type studies dominates GIM research. Of the 314 publications analyzed, 145 (46.2%) can be considered single country studies. All of these studies focus on different aspects of managing information resources in a domestic context. Most of these studies are Type Ia and Ic research using the case study or non-data research strategies. For instance, Kautz & McMaster (1994) presented a case study of an attempt to take a structured development method



Research Themes In GIM Research	Description
Single Country Studies	The development, operations, management and use of IT in a domestic context. Does not include the management of information resources in a global context. For example, the adoption of IT in rural China.
Comparative Study of Nations	The comparison of IT development, operations, management and use between two or more countries. Culture is not a variable in these studies. For example, comparing the skills of systems analyst in Canada, New Zealand and Singapore.
Culture / Socio-economic Issues	The effect of national culture on IT development, operations, management and use. These are regarded as “pure” cross-cultural studies as opposed to those merely comparing nations. For example, exploring the effect of complex cultural dimensions on the level of IT transfer in Arab nations. Also includes socio-economic issues relating to IT like government policy, legislation and economic factors.
Research Frameworks and Issues	Conceptual research offering frameworks, theory and research agendas on various aspects of global information management. Key issues studies in IS management from around the globe are included.
Global Information Resources Management	The development, operations, management and use of IT in a global context. Includes the management of information resources in a regional but not domestic context. For example, managing global IT outsourcing; motivating global IT development teams; and managing the introduction of telecommunications technology in Latin America.
Global Enterprise Management	Functional management of enterprises across national boundaries using IT. Includes the management of multinational and trans-national corporations. For example, the impact of IT on global supply chains, global distribution or global marketing.

Table 5: Research Themes Distinct to GIM Research

Research Themes Distinct to GIM	Research Themes Count	Research Themes Percent
Single Country	145	46.2
Comparative Study of Nations	49	15.6
Culture / Socio-economic Issues	29	9.2
Research Concepts & Issues	23	7.3
Global Information Resources Management	53	16.9
Global Enterprise Management	15	4.8
Total GIM Publications	314	100

Table 6: Research Themes Distinct to GIM Research

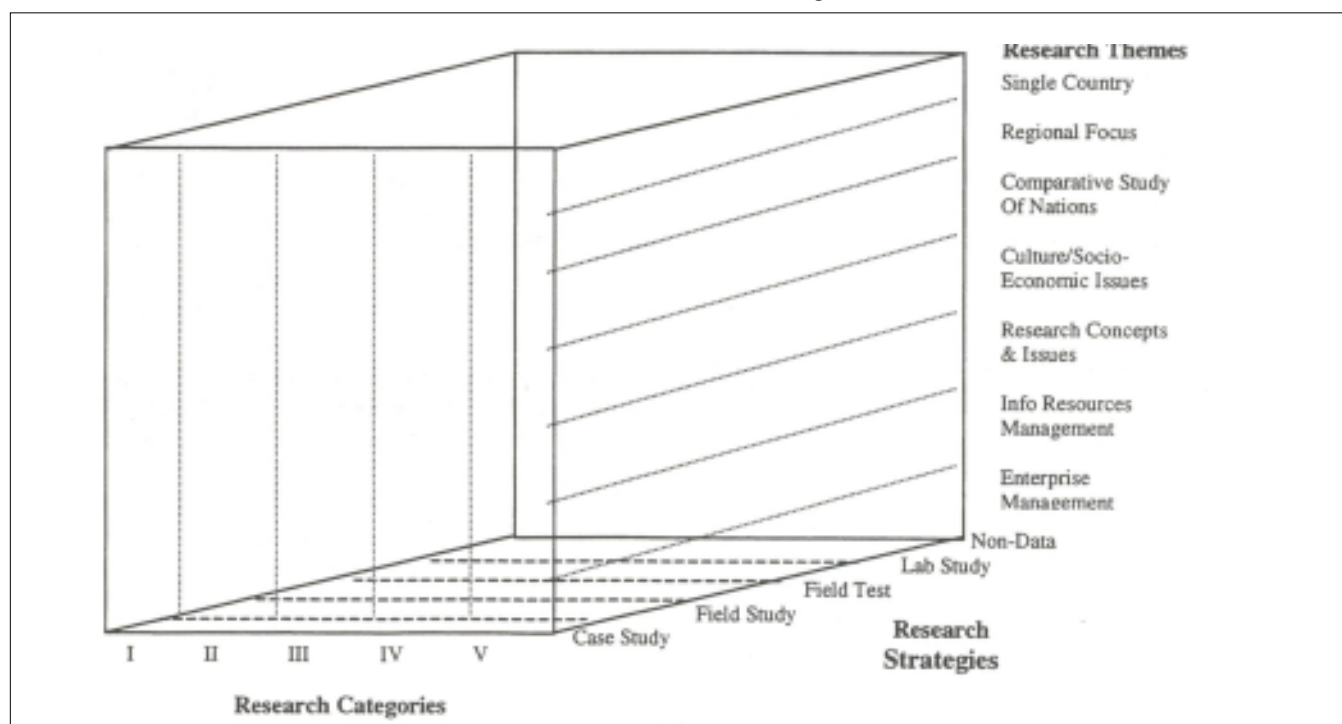


Figure 4: A Global Information Management Research Framework

into use in the IT unit of a UK public sector organization. Wan & Lu (1997) provided an overview of computer crime and related legislation in the People's Republic of China using a non-data research strategy.

Studies comparing two or more nations prove to be another fruitful area of work. Forty nine (15.6%) can be classified into this group. The majority of these articles fall under the Type Ib and Type II categories. Three of the 6 Type III research are also comparative studies of nations. Several of these studies have compared the US to countries from Europe, Asia and the Middle East. For example, Abdul-Gader & Kozar (1995) examined the impact of computer alienation on IT investment decisions between the US and Saudi Arabia. Straub, Keil & Brenner (1997) tested the Technology Acceptance Model across three countries—Japan, Switzerland and the US. Others have compared two or more countries in the same region. For instance, Simon & Middleton (1998) analyzed the human resource management best practices in IS departments in Singapore, Hong Kong, Malaysia and the People's Republic of China. Tam (1998) examined the impact of IT investments on firm performance and evaluation in four newly industrialized economies in Asia. In all of these instances, field study research strategy was used.

The "global information resources management" research theme accounts for 53 (16.9%) of the sample surveyed. Research in this category considers the development, operations, management and use of IT in a global context. It includes the management of information resources in a regional but not domestic context. Most of the research in the global context is Type Ia and Ic using either case study, field study or non-data research strategies. Examples of these are: Ramanujan & Lou (1997) who conducted a field study on the issues involved in selective outsourcing of maintenance operations from an off-shore location; Gibson & McGuire (1996) who discussed quality control for global software development using non-data research strategy; and Trauth & Thomas (1993) who called for a global standards policy for EDI.

The articles focusing on regions are primarily Type Ia research employing non-data research strategy. These articles describe IT related issues in a given region or prescribe guidelines for IT diffusion and transfer in developing countries. These publications are not studies comparing countries within the region. For example, a paper by Gibson (1998) identifies important developmental factors in the relationship between IT diffusion and economic development in Latin America. Loh, Marshall & Meadows (1998) discuss the ethical appropriateness of information and communication technologies for developing nations.

The "culture / socio-economic issues" research theme account for 9.2% of the 314 articles surveyed. What was surprising though is that a only 15 (3.7%) of the total sample surveyed are what we considered "pure" cross-cultural research as opposed to studies merely comparing two or more nations, but label themselves as multi-cultural studies. All of these publications are considered Type II GIM research and field study is the predominant research strategy used. These 15 articles deal with and address the cultural dimensions and

elements which are inherent in the countries studied. For instance, Hill et al. (1998) focuses on the complex sociocultural constructs (beliefs and values) which can influence the level of IT transfer in Arab nations. Straub (1994) investigated the effect of culture on the use of email and fax technologies in Japan and the US. Harvey (1997) conducted an ethnographic study of national culture differences in IT theory and practice between Germany and the US using Hofstede's (1980) framework. Most of the publications dealing with the socio-economic issues are considered Type Ia GIM research which primarily employ non-data research strategy. An example of this is the article by Mehta & Darier (1998) who discussed electronic governmentality via the Internet.

The remaining two themes—"research frameworks & issues" and "global enterprise management"—together account for less than 13% of the research surveyed. Conceptual research offering frameworks, theory and research agendas on various aspects of GIM are categorized into the former group. For example, Nelson & Clark (1994) propose a research framework for cross cultural issues in IS research. Martinsons & Westwood (1997) developed an explanatory theory of MIS in Chinese business culture. Deans & Ricks (1993) suggest an agenda for research linking IS and international business. Studies of key issues in GIM practice and research are also included in this grouping (Watson et al., 1997; Mata & Fuerst, 1997; Yang, 1996; Burn & Ma, 1993). The "global enterprise management" grouping focuses on research dealing with the management of different aspects of the enterprise across national boundaries using IT. The published research surveyed used both field and case study methodologies and primarily fall under Type I and Type II categories. The bulk of the research, which falls in this grouping, is publications on multinational companies. For instance, Chidambaram & Chismar (1994) examined the use and investment patterns in U.S. multinational corporations. Cummings & Guynes (1994) compared the IS activities in U.S. and non-U.S. subsidiaries of transnational corporations. There is, however, a dearth of studies dealing with IT and global supply chain, human resource, marketing, manufacturing and distribution management. Exceptions are studies by Niederman (1993) and Sankar & Liu (1998).

## Discussion and Call to Action

The application of the published research studies in GIM to the 3-dimensional GIM research framework indicates a number of obvious gaps in the research that has been conducted to date. This section discusses the findings of the analysis of 314 GIM research publications and presents a call to action to GIM scholars. GIM research categories, research strategies and research themes and their call to action are discussed in turn.

### GIM Research Categories

What is immediately apparent is that most GIM research has been essentially Type I single variable studies and most of

these have focused on environmental variables (see Table 2). The lack of research across variable groups is interesting and may be leading to “one-dimensional” research that does not consider a variety of factors that make GIM so interesting and challenging.

It may be that the single variable group studies are the simplest and easiest to conduct. In the global context, this is an important consideration when “simple research” may involve multiple trips to different countries to complete the research. It may also be that single variable research provides the sharpest focus for research in this area and that conducting research across multiple variable groups leads to a level of complexity that is difficult to handle for both researchers and readers. Finally, the current scope and boundary of the field as perceived by its researchers may be somewhat ‘narrow.’ The lack of an overall research framework guiding GIM scholars may have contributed to this perception.

**Call to action:** We therefore encourage GIM researchers to move beyond the current single variable focus. Starting with the GIM Research Framework presented in Figure 4 and the findings of this paper, researchers can begin considering the dependent and independent variables to be studied. For instance, studies of environment variables should now include a measure of impact on a process variable - development, operations and/or use, or a measure of impact on the characteristics of the global system being investigated. Research including variables from each of the three variable groups in the GIM research model (Figure 2) can lead to a more comprehensive understanding of the field. An example of this research might be a comprehensive study of the impact of national culture on the characteristics and use of a global EIS application.

### GIM Research Strategies

In terms of research strategies, the predominant methods have been case and field studies as well as what we term “non-data” studies. Virtually no studies have been conducted using field tests and laboratory studies. This extensive use of qualitative techniques may be giving the impression that GIM research can not be conducted using more quantitative techniques. We don’t believe this is the case. Certainly the use of qualitative strategies has added to the field and more quality studies of this type need to be conducted, perhaps using a variety of qualitative techniques from wider disciplines (Myers, 1997). In addition, we believe that there is also a need to conduct rigorous GIM research using quantitative techniques such as experiments. The balance between qualitative and quantitative approaches seem to be lacking in this area. We believe that conducting more quantitative studies where more variables are controlled and measured will provide the field with research that is testable and replicable.

**Call to action:** We agree with Palvia (1998a) that what is required is the building of a cumulative tradition in GIM research - a model based approach, developed a priori, with clear research questions and/or propositions to be investigated. As presented earlier, the GIM field is an extension of the

traditional IS field - beyond a single system in a single location to multiple systems, with diverse users in a global environment. We argue that models developed and validated in the traditional IS field can be and should be applied to and validated within the global context. We are beginning to see some of this occurring in the more recent publications. For instance, Rose & Straub (1998) applied the Technology Acceptance Model to the Arabic World, and Straub, Keil & Brenner (1997) tested the Technology Acceptance Model across three countries - Japan, Switzerland and the US. However, there is an issue researchers must be alerted to as they consider variables to be included in their study. It is not as straight forward to operationalize many of these variables in a global setting. For example, does user satisfaction have the same meaning in countries with different cultures? Researchers are therefore warned to be very cautious when using measures validated in one global setting in another global setting.

Interviewing is the dominant technique employed by qualitative strategies surveyed in this paper. There are very few researchers who break out of the traditional mould and conduct studies using techniques like ethnography, interpretive epistemology or grounded theory. Examples of recent studies employing these approaches are Harvey (1997), who conducted an ethnographic study of national culture differences in IT theory and practice between Germany and the US; and Montealegre (1998) who explored Internet adoption in four Latin American countries using interpretive epistemology. We therefore challenge GIM scholars to consider using alternative qualitative techniques in GIM research.

### GIM Research Themes

Single country “domestic” studies have been the predominant research theme. These type of research can be mostly classified as Type Ia and Ic categories of GIM research. They tend to be descriptive and exploratory. According to Palvia (1998a), these “first generation” studies are important especially during the early years of GIM research. “They have been useful in defining the global IT field ...(and have)...given us a reasonably good grasp of global IT” (p. 7).

**Call to action:** We believe that single country studies are as important today as they have been in the early years of GIM research, provided these studies include some insights for GIM practice and research. For instance, a study of the influence of government policy on the adoption of global neural networks in Latvia is only useful if it includes discussion on the implications of the study findings to GIM practice (ie. to international companies planning to do business in the country) and research. Opportunities also abound for research on themes relating to national culture and global enterprise management. Surprisingly, there is comparatively little published research in journals examining national culture. It is generally accepted that differences in national culture may explain variations in IS in different cultures (Deans & Ricks, 1991; Ein-Dor et al., 1993; Shore & Venkatachalam, 1995 & 1996). We therefore call for more research exploring how

national culture can impact on the global IS process measures and to better understand the characteristics of IS developed and used in various cultural settings. There is also very little published research into aspects of global enterprise management. Organizations, which span national boundaries, are required to operate rather differently from those in a domestic context. How can IT be used to best support and enhance the international competitiveness of these enterprises? We urge our GIM research colleagues to embark on more investigations into the impact of IT on the global supply chain, human resource, marketing, manufacturing and distribution management. This aspect of GIM research may not be within the traditional scope of IS research, but we believe is equally compelling as organizations grapple with the management of their functional operations as they establish and compete globally. To this end, the Journal of Global Information Management recently published a special issue on the global management of IT human resources (volume 7, number 2) and is working on another issue on IT support for global sourcing and procurement.

## Conclusion

This paper proposes a 3-dimensional GIM research framework which takes into account three important aspects of GIM research—research categories, research strategies and research themes. The application of past and current research to the GIM research framework indicates that much work needs to be done in some areas and that some research areas may be reaching saturation. By describing this research framework we hope to guide future GIM research into productive areas that will facilitate the accumulation of knowledge in a systematic and comprehensive way.

## Endnote

i refer to Watson, Kelly, Galliers & Brancheau (1997) for a summary of the 'key-issues' studies around the globe.

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