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through the lens of espoused theories of is.

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COMMUNITY ON THE WATCH:
MAKING SENSE OF IS RESEARCH
THROUGH THE LENS OF ESPOUSED THEORIES OF IS

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Abstract

Community on the Watch: Making Sense of IS Research through the Lens of Espoused Theories of IS

In the IS field there has been an ongoing tradition to study the publication output of the community in order to evaluate the current and potential situation of IS research. In this work, we follow a different strategy and study what IS research claims to be. We look at those so-called 'espoused theories of IS' as found in the General Editorials Statements (GES) of IS journals. Based on the AISWorld journal ranking, we collected GES for 30 leading IS journals for the years 1997 and 2007. We applied thematic, lexicometric, and factor analyses to the datasets of the 1997 and the 2007 GES. Our results show that the representation of IS research in the GES has changed little over the last decade.

Keywords: Espoused Theory, Information Systems (IS), Research, Expectations, General Editorial Statement (GES), IS Journals, Thematic Analysis, Lexicometric Analysis.

1. Introduction: investigating the 'official line' about IS research

In the IS field, there has been an ongoing tradition to study the publication output of the community. Two approaches, descriptive and normative, are normally followed when studying the IS field and its works.

Descriptive studies analyze published articles and citation data. They grasp the variety of IS topics and infer some theories in use by defining what IS research is in the eyes of researchers (e.g., Desq et al. 2002, 2007; Larsen, Levine 2007; Lim et al. 2007). Often, they are based on broad categorizations of research papers (e.g., Orlikowski and Iacono 2001; Robey 1996). More rarely, they draw on citations analyses which focus on the dynamics of researchers' social networks, authors' relationships, and research field interdependencies (e.g., Clarke 2008; Holsapple, Luo 2003; Loebbecke et al. 2007). Many descriptive works emphasize a growing variety of IS research (Desq et al. 2007; Vessey et al. 2002) with increasingly blurry boundaries between IS and other fields such as computer science, information science, sociology, and history of technology (de Vaujany 2005; Vessey et al. 2002).

Normative works reflect on what IS will or should be. They emphasize IS research objects and propose boundaries to the IS field. They call for a focus on the technological artifact (Benbasat, Zmud 2003), stress the need for a certain interpretive flexibility in IS topics (Robey 2003), or investigate editorial essays about IS research (El Sawy 2003; Myers 2002). Most normative research works take the shape of essays and are not grounded in empirical materials which could likely convey expectations about IS research.

Rarely do studies about IS research explore what traditional scholarly forums such as IS journals, conferences, and workshops offered by leaders in the field claim IS to be – i.e., existing research rarely focus on the expected 'official line' of the IS research.

Given the growing diversity of IS topics, due to the plethora of new technologies and tools that have emerged over the last decade, the lack of studies focusing on the expectations of the development of the field can hardly be justified. Especially, in the light of a debate on the

'identity crisis' of the field, the set of practices that define the field, i.e., the IS scientific paradigm – the theories, methods, problems, and expectations – should be investigated.

In this work we aim to fill the gap. We study what the IS community claims or wants the IS discipline to be. We look at the so-called 'espoused theories of IS' (Argyris, Schön 1978) directly or indirectly expressed in the General Editorial Statements (GES) of leading IS journals.

The GES – found under the headings 'Information about journal X', 'Authors guidelines', 'General Editorial Statement', etc. – position a journal vis-à-vis its potential authors, its readers, and the whole IS community. They present the aims, purposes, and scope of a journal and typically cover issues such as expected topics, expected research methods, affiliations, and target audience. They are usually written by Editors-in-Chiefs (EiCs) and valid for several journal volumes. Hence, they provide a comparatively stable, general, and institutional view of IS journals and thus of IS research.

Investigating those GES (what IS publications should cover) complements the other studies of the actual IS publications (what IS research is), and should thus stimulate a discussion on the identity of IS research. GES can help us to shed light on IS espoused theories (see excursus below)¹.

¹ Usually written by Editors in Chief or Senior Editors (i.e., leading scholars of the community), GES are a landmark for the all community with regards to core expectations and convictions about scientific action. They are thus quite close to Argyris and Schön's espoused theories.

An 'espoused theory' is "the theory of action to which he [or she] gives allegiance, and which upon request, he [or she] communicates to others" (Argyris, Schön 1974, p. 7). It is an account or a justification given to others when asked about the motives of action. As a verbal presentation of IS research for internal and external stakeholders, an espoused theory points to the expected topics and boundaries of IS research.

In contrast, a 'theory in use' contains the 'collective identity' of the field, a theory of action which is understood as "assumptions about self, others and environment" (Argyris, Schön 1974, p. 30). It reveals what is the very nature of IS research, its core and its relevant boundaries.

Both, espoused theories and theories in use can be individual or collective (as those shared by the IS community). They are not static, but evolve through single or double loop learning (Argyris, Schön 1974). Throughout such learning processes, the research community needs to support the self-identity of its members and to maintain its collective identity (Schön 1973, p. 57).

The remainder of the paper is structured as follows. Firstly, the research approach focused on 5 key issues will be detailed. Data collection and data treatment based on thematic and lexicometric analysis will be explained. Then analysis results will be presented, followed by discussion about the contributions, limitations and avenues for further research.

2. Research Approach: How to Make Sense of IS Espoused Theories Through GES?

2.1. Data Collection of 1997 and 2007 General Editorial Statements

To investigate what IS research claims and wants to be, i.e., to investigate the so-called 'espoused theories of IS', over a ten-year time-span, we analyze the GES from 30 leading IS journals for 1997 and 2007 (see Appendix 1). We choose GES as source for our study over other sources such as calls for papers because GES are more institutionalized and less elusive than most conference themes. They are also more general than calls for papers for journal special issues.

We selected 30 IS journals (and their GES for 1997 and 2007) based on the following procedure. From the AISWorld ranking², we removed (1) general management journals (i.e.,

² <http://ais.affiniscape.com/displaycommon.cfm?an=1&subarticlenbr=432>

Management Science, Harvard Business Review, Sloan Management Review, Academy of Management Journal, Journal of Management Systems, Organization Science, Administrative Science Quarterly, Academy of Management Review, California Management Review), (2) journals that started publishing later than 1997 (i.e., Communication of the AIS, IEEE Transactions on Industrial Informatics, IEEE Computer), and (3) AI Magazine, Journal of Database Management for which we did not have access to the 1997 GES. We then filled the list up to 30 journals following the AISWorld ranking. Finally, we included 'IEEE Transactions on Industrial Electronics' as we considered it part of the IEEE. For the resulting list of 30 journals, see Appendix 1.

From 60 GES (the two years, 1997 and 2007, from all the 30 IS Journals), we extracted the full text body³ and applied several analytical methods as described in the following section.

2.2. Data Analysis Approach: thematic and lexicometric analysis

The first reading of the GES, and the initial coding (see appendix 2), revealed the presence of five main issues in the data. The following exploratory approach to data analysis focused on these five issues. The exploration was mostly based on thematic and lexicometric analysis.

³ For general lexical treatments, we removed both irrelevant contents (mainly addresses or administrative instructions) and so-called "tool words" such as adverbs and nouns (see Bolden and Moscarola, 2000). For thematic analysis, we also removed irrelevant contents (i.e. details of administrative procedure, address and advertising) but kept of course tool words.

Exploratory issues

Issue 1: Thematic variety of GES. What is the evolution of GES thematic variety (e.g., variety of themes covered) between 1997 and 2007?

Issue 2: Lexical variety of GES. What is the evolution of GES lexical variety (e.g., vocabulary variety) between 1997 and 2007? This issue can be treated both at the level of global GES or the specific parts of GES discussing the expected topics treated by GES.

Issue 3: Evolution in the topics covered. What is the evolution of the trend in the number of topics covered in GES between 1997 and 2007?

Issue 4: Focus of these topics. Has there been a shift in emphasis in GES on either topics or ambitions (or both) between 1997 and 2007?

Issue 5: Link with other disciplines. What is the expected relationship between IS and other external disciplines (i.e., computer science, sociology, economics, etc.)? Has the rate of referencing other scientific fields in GES increased between 1997 and 2007?

For the exploration of issues 1, 2 and 3 (thematic variety, lexical variety, and evolution in the topics, respectively), we applied a thematic analysis (Bardin 1998; Weber 1990), which builds on a thematic dictionary and searches texts for categories and sub-categories. We used a cross-coding procedure to iteratively develop an initial version of the thematic dictionary based on a GES sub-sample. To increase validity (see Weber 1990), all GES were cross-coded by two authors. Appendix 2 illustrates the cross-coding for an exemplary GES. Appendix 3 presents the thematic dictionary used for GES coding. It is focused on four main categories: TOPIC (the topics covered by the journal), METH (methodological and epistemological aspects), AUD (targeted audience), and CONT (expected level of quality and contributions).

Beyond a descriptive analysis of our thematic coding (i.e., counting of the coding), we also factor analyzed the thematic coding (see Tennenhaus 1993) and compared the results of 1997 to those of 2007. This approach allowed us to get a broader picture of the similar changes in the categories, sub-categories and journals between 1997 and 2007. Based on the results of the factor analysis, we retrieved the structuring axis in the content of GES. It helped us to identify potential changes in categories, sub-categories, and journals comparing 1997 to 2007.

To explore issues 4 and 5 (focus of the topics and link with other disciplines, respectively), we applied a lexicometric analysis (Guilhaumou 1986; Bolden and Moscarola, 2000), which quantitatively describes textual sequences of a corpus. It relies on (1) counting occurrences of words used in a text (without adverbs or prepositions), (2) co-occurrences (i.e., 'pivot words' to the left or right of some key words), (3) repeated text segments like 'information system', 'information technology', and (4) lexicometric indicators such as the Type Token Ratio (TTR), i.e., "the variety (or poverty) of the vocabulary by means of a ratio comparing the number of different words compared to the total number of words" (Bardin 1998, p. 256). TTR enables the calculation of words lexicon and identification of relevant textual fragments (Bolden and Moscarola, 2000).⁴

Technically speaking, lexical variety has been treated by means of two sub-dimensions (applied either to GES or specific segments of GES):

- '*Lexical richness*' measured as the proportion of different words and unique words over the total number of words in the GES or specific segments of GES.
- '*Strict lexical variety*' - measured as the number of unique words over the number of different words in the GES or specific segments of GES.

In continuation to Bolden and Moscarola (2000) and Bardin (1998), we operationalized key notions of lexicometric and thematic analysis in the following way (see Table 1 below):

⁴ All treatments have been carried out by means of the software Sphinx Lexica.

Table 1. Operationalization of the key lexicometric and thematic variables in the analysis

VARIABLE	DEFINITION	OPERATIONALIZATION
General Editorial Statements (GES)	General Editorial Statements present the aims, purposes, and scope of a journal and typically cover issues such as expected topics, expected research methods, affiliations, and target audience.	GES can be found in the hard or electronic copies of IS journals. For general lexicometric analysis, we did not treat the 'raw material' (i.e., all texts corresponding to GES). We removed all words corresponding to tool words (such as adverbs and nouns) and irrelevant contents (such as addresses and description of strict administrative procedures). For more precise lexicometric analysis (i.e., detailing occurrences and co-occurrences for a specific code), we treated data including tool words (but without irrelevant contents). Lastly, thematic coding has been applied to GES without irrelevant contents (i.e., we did not code data such as addresses or administrative procedures).
Number of words	Counting of the number of words for lexicometric analysis.	For general lexicometric analysis, the number of words does not include tool words and irrelevant contents. For lexicometric analysis applied to a specific code, number of words includes tool words but not irrelevant contents.
General lexicometric/lexical analysis (of GES)	General lexicometric analysis corresponds to lexicometric treatments applied to GES on the whole. In contrast, we also did lexicometric treatment applied to specific codes (e.g. the consolidation of all segments coded TOPIC have undergone a lexicometric analysis).	Counting and ranking of words occurrences, co-occurrences and repeated segments applied to all text (without irrelevant contents and tool words).
Most frequently used words	Counting (and ranking) of words most frequently used in GES. Related to general lexicometric analysis.	Relative frequency of GES lexical (i.e., frequency of occurrence of words). The software we used displays the result by means of a ranking.
Number of coding	Number of times codes (referring to categories or sub-categories) of the thematic dictionary have been applied.	The software counted the number of uses of each codes (e.g. TOPIC-DES, AUD-AMB, CONT-PURP, etc) (for descriptions of codes and sub-codes used, see appendix 3).
Lexical variety (of GES)	Lexical variety has been treated by means of two sub-dimensions (applied either to GES or specific segments of GES): lexical richness and strict lexical variety (see below).	See below instrumentation for each sub-dimension.
Lexical richness (of GES)	Lexical richness refers to the richness of the vocabulary used in GES.	Lexical richness measured as the proportion of different words and unique words over the total number of words in the GES.
Strict lexical variety (of GES)	Strict lexical variety refers to a key question: is richness related to the use of unique words (i.e., words used only one time) or different words (i.e., a lot of different words, whatever their level of use)?	Strict lexical variety, i.e., number of unique words over the number of different words.
Lexical variety of a specific category or sub-category (e.g. TOPIC)	Same as lexical variety of GES but declined to the consolidation of segments corresponding to a specific code.	See lexical variety of GES.
Number of different topics covered in GES	Counting of the different issues/topics expected/covered by a GES (and described in all segments of text coded TOPIC).	Counting of the aforementioned topic for all GES.
Number of words in a category or sub-category	Number of words used for all segments of texts coded for a specific category or subcategory.	Counting of words per category or subcategory. Applied to the corpora including tool words (but not irrelevant contents).

3. Results of lexicometric and thematic analysis

3.1. Descriptive Statistics

3.1.1. Lexicometric Analysis: Number of most frequently used Words

All analyses related to the number of words have been conducted after having eliminated the irrelevant content (mainly administrative information⁵). However, with the exception of counting of occurrences, co-occurrences and repeated segments, tool words have been kept.

Corpora of words under investigation (without irrelevant contents but with tool words) for 30 GES in 1997 and 2007 are 5,618 and 9,420, respectively. The comparison of 1997 and 2007 GES is based on the most frequently used words, measured as the relative frequency of GES lexicon.

The comparison of the set of the most frequently used words (relative frequency of GES lexical) shows similarities for 1997 and 2007. 21 words are identified and organized in six groups of words and two categories (see Appendix 4).

Considering which of those frequent words are used most frequently, however, shows significant differences for the two years. Some words are frequently used in one year (relative frequency of GES lexical $> 0.25\%$), but less frequently in another year (relative frequency of GES lexical $\leq 0.1\%$). A corpus of six words is identified and organized in three categories (see Appendix 5).

3.1.2. Lexicometric Analysis: Pivot Analysis / Co-Occurrence of Words

Table 2 shows the results of a pivot analysis on the words 'systems', 'information' and 'management'.

⁵ Such as the address and names of administrative managers, technical descriptions of the electronic procedure to submit papers, advertisings or legal information about the journal.

Table 2. Frequency of Words Associated with 'Systems', 'Information' and 'Management'

Pivot Word (#)	Most Frequently Associated Words	Word Associations 1997			Word Associations 2007			Relative Frequency (%)		
		Pivot	Pivot	Σ	Pivot	Pivot	Σ	1997	2007	Δ
		-2 & -1	+1 & +2		-2 & -1	+1 & +2				
System(s) 1997: 112 2007: 147	Information	44	1	45	64	2	66	40.18	44.90	+4.72
	Database(s)	3	0	3	8	3	11	2.68	7.48	+4.80
	Management	9	1	11	7	2	9	8.93	6.12	-2.81
	Support	5	2	7	8	1	9	6.25	6.12	-0.13
	Human(s)	0	1	1	4	2	6	0.89	4.08	+3.19
	Communication	1	1	2	1	5	6	1.79	4.08	+2.29
	Computer	3	2	5	4	1	5	4.46	3.40	-1.06
	Application(s)	0	2	2	0	7	7	1.79	5.76	+3.97
	Development	0	5	5	1	1	2	4.46	1.36	-3.10
Information 1997: 97 2007: 106	System(s)	1	44	45	2	64	66	46.39	62.26	+15.87
	Technolog(y/ies)	0	18	18	0	8	8	18.56	7.55	-11.01
	Management	6	6	12	5	4	9	12.37	8.49	-3.88
	Application(s)	6	2	8	1	5	6	8.25	5.66	-2.59
	Access	0	0	0	0	8	8	0.00	7.55	+7.55
	Retrieval	0	2	2	1	7	8	2.06	7.55	+5.49
Management 1997: 40 2007: 53	Resource(s)	0	8	8	1	2	3	8.25	2.83	-5.42
	System(s)	1	9	10	2	7	9	18.87	22.50	+3.63
	Information	6	6	12	4	5	9	22.64	22.50	-0.14
	Database	1	0	1	6	2	8	1.89	20.00	+18.11
	Data	3	1	4	6	0	6	7.55	15.00	-7.45

The word 'system(s)' mainly co-occurs with the word 'information'. In addition, it is related to words such as 'database(s)', 'management', 'support', 'human', 'computer', 'engineering', 'applications', 'development'. **The presence of the word 'system' and its relationships with many central IS terms seems to fit Alter's (2003) vision of IS research as being more related to a systemic vision of organizations and their flow of information than to IT artifacts.**

The word 'information' mainly co-occurs with the word 'system(s)'. It also appears together with words such as 'technolog(y/ies)', 'management', 'application(s)', 'access', 'retrieval', 'resource(s)'. 'Information' seems more often seen as part of a technology than as content. A

limited number of GES explicitly invite researchers to submit non-technical papers about information management.

The word 'management' is mainly associated with the words 'system(s)', 'information', 'database' and 'data'.

3.1.3. Thematic coding: key results

Table 3 summarizes the distribution of coding across codes (see Appendix 3 for the thematic dictionary).

Table 3. Coding in GES

Category	Code	Number coding		Corresponding percentage		
		1997	2007	1997	2007	Δ
Audience	AUD	70	62	46.4	28.7	-17.7
Expected Contribution	CONT	43	96	28.5	44.4	15.9
Method	METH	3	13	2.0	6.0	4.0
IS topic	TOPIC	35	45	23.2	20.8	-2.4
Total		151	216	100	100	

Both in 1997 and in 2007, the coding AUD and CONT dominate over TOPIC and METHOD which one could interpret as **GES focusing more on the description of their audience and the expected contributions than their expected/legitimate topics**. Further, the number of AUD coding decreases (-17.7%) while the number of coding concerning the expected contributions (CONT) and methodological aspects increase by 17.9% and 4% respectively.

Factor analysis of the thematic coding also shows interesting results. For 1997, the factor analysis shows two main axes (see Table 4). The main structuring axis (with a low explained variance = 5%) distinguishes journals focused on methodology and expected level of contributions (rigor and relevance), from journals stressing the targeted audience (academic and/or practitioners) and ambition (editorial line). In contrast, for 2007, the main axis

contrasts journals emphasizing the editorial line versus journals emphasizing the level of contributions and evaluation criteria.

Table 4. Factor Analysis of Thematic Coding for 1997 and 2007

Contribution	1997				2007			
	Axis 1 (%) (+5%)		Axis 2 (%) (+4,6%)		Axis 1 (%) (+4,2%)		Axis 2 (%) (+ 3,9%)	
Positive	METH	+11,8%	METH	+26,6%	AUD	+17,4%	AUD	+10%
	CONT	+9,5%	OTHER	+10,1%	AMB	+7,9%	METH	+3,8%
	CRIT	+5,3%	QUANT	+9,4%	FREQPUB	+3,4%	AMB	+3,8%
	ISR	+4,4%	COMB	+7,2%	MIXPRO	+2,6%	MIXPRO	+3,0%
	QUANT	+4,4%	JMIS	+4,6%	TOPIC	2,4%	JMIS	+2,4%
Negative	AUD	-15,5%	CONT	-8%	CONT	-15,7%	TOPIC	-26,8%
	AMB	-4,4%	MIX	-3,4%	CRIT	-8,9%	DES	-18,6%
	MIXPRO	-4,1%	HCI	-1,8%	CACM	-5,8%	USE	-5,1%
	AFF	-3,8%	TOPIC	-1,8%	TYPEPAP	-5,7%	MIX	-3,4%5

3.2. Exploration of our fives core issues regarding GES evolution

Issue 1: *What is the evolution of GES thematic variety (e.g., variety of themes covered) between 1997 and 2007?*

The number of coding, i.e., the number of times codes of the thematic dictionary have been used, increased by 43% from 151 in 1997 to 216 in 2007 (see Table 3), whereas the number of words in the GES after elimination of irrelevant content increased by 67.9% from 5,618 to 9,420 (see Table 5). Compared to 1997, we find no new categories or sub-categories in the coding of 2007 GES.

Table 5. Difference of Words Devoted to TOPIC in GES (1997 and 2007)

	Words (a)	Words in TOPIC Category (b)	Relative frequency of GES devoted to TOPIC (b)/(a) [in %]
1997	5,618	2,171	38.6
2007	9,420	3,230	34.3
Δ	+3,802 (+67.9%)	+1,059 (+48.8%)	-4.3

Overall, we calculate a statistically significant (-4.3%, Chi-squared = 28.809, $p < .0001$)⁶ decrease regarding the number of words devoted to TOPIC (see Table 5). Relative to the number of words in the GES, the thematic variety did not increase between 1997 and 2007. **Hence, somewhat surprisingly, there is a negative trend with regard to the thematic variety.**

Issue 2: *What is the evolution of the GES lexical variety (e.g., vocabulary variety) between 1997 and 2007?* This issue can be analysed both at the level of global GES or the specific parts of GES discussing the expected topics treated by GES (see Table 6 and Table 7).

Table 6. Lexical Variety of GES

	Words in GES (a)	Different Words (b)	Unique Words ©	Relative Lexical Variety [in %]	
				Different Words (b)/(a)	Unique Words ©/(a)
1997	5,618	1,350	729	24.0	13.0
2007	9,420	1,797	835	19.1	8.8
Δ	+3,802 (+67.7%)	+447 (+33.1%)	+107 (+14.5%)	-5.0	-4.1

⁶ Value for Chi squared with Yate's correction.

Analyzing the 1997 over the 2007 GES shows an increase in the number of words (+3,802 or +67.7%), the number of different words (+ 447 or +33.1%), and the number of unique words (+ 107 or +14.5%) as a subset of different words (see Table 6).

The overall lexical richness measured as the proportion of different words (-5.0%, Chi-squared = 51.884, $p < .0001$) and unique words (-4.1%, Chi-squared = 63.416, $p < .0001$) over the total number of words in the GES shows a statistically significant decrease. **The overall lexical strict variety, i.e., the number of unique words over the number of different words (Chi-squared = 17.5, $p < .0001$) has decreased significantly.**

Table 7 Lexical Variety of the TOPIC Category

	Words in TOPIC (a)	Different TOPIC Words (b)	Unique TOPIC Words (c)	Relative Lexical Variety [in %]	
				Different TOPIC Words (b)/(a)	Unique TOPIC Words (c)/(a)
1997	2,171	714	293	32.9%	13.5%
2007	3,230	892	283	27.6%	0.0%
Δ	+1059 (+48.8%)	+178 (+24.9%)	-10 (-3.4%)	-5.3%	-13.5%

Further, considering the lexical richness in the TOPIC category, measured as a ratio of the number of different words to the total number of words of the TOPIC category, we find a statistically significant (Chi-squared = 17.020, $p < .0001$) decrease (see Table 6).

With regards to Issue 2, we conclude that even though both the complexity of IS research and the volume of IS journals' GES have significantly increased between 1997 and 2007, the lexical variety has decreased.

Issue 3: *What is the evolution of the trend in the number of topics covered in GES between 1997 and 2007?*

On the basis of our thematic dictionary (see code TOPIC in appendix 3) and its application, we notice for Issue 3 that topics did not evolve between 1997 and 2007⁷. The notion of IS is never defined. Most GES maintain a high level of generality (both for 1997 and 2007). Furthermore, epistemology-related codes were rarely used. GES increasingly avoid delineations of topical areas, always suggesting a non-sufficiency when a list of subjects is put forward. **The IS field seems to be 'out there', and its definition never treated in 2007 GES.**

Issue 4: *Has there been a shift in emphasis in GES on either topics or ambitions (or both) between 1997 and 2007?*

Table 8. Ambition and Topics Categories

	AMB	TOPIC	Ratio
	Words (a)	Words (b)	(a)/(b) [in%]
1997	715	2,171	32.9
2007	1,036	3,230	32.1
Δ	+321 (+44.9%)	+1,059 (+48.8%)	-0.9

Table 8 shows a statistically significant increase in the number of words on the ambitions of journals (Chi-squared = 10.059, p=.0015). However, the AMB/TOPIC ratio shows a slight, statistically not significant decrease (-0.9%, Chi-squared = 0.198, p=0.6567). **Hence, journals increasingly put the emphasis on ambitions, and not on topical description.**

Issue 5: *What is the expected relationship between IS and other external disciplines (i.e., computer science, sociology, economics, etc.)? Has the rate of referencing other scientific fields in GES increased between 1997 and 2007?*

⁷ Even if the number of words increased by 48% between 1997 and 2007.

If other scientific fields (like computer science, economics, sociology, information science, etc.) play a relevant role in IS publication outlets, this increase should be relative, compared both to the increase in the volume of GES (see Table 6 above) and the proportion represented by the sub-category EXTRA in the category CONT. Increase in CONT is statistically significant (with $p < .05$ / $p = 0.468$) and increase in EXTRA is not statistically significant (Chi-squared = 0.061, $p = 0.8050$), which leads us to conclude that there is no strong evidence of increased referencing of external disciplines between 1997 and 2007 in the GES.

4. Discussion: contributions, limitations and avenues for further research

4.1. Contributions: what about IS espoused theories?

We found that the vocabulary and topics used in GES have not diversified from 1997 to 2007. **Over the decade, new technologies emerged** (i.e., e-business tools, social networks, web 2.0, ERP, etc.), **new managerial practices arose** (i.e., in KM, project management, strategic evaluation, etc.), and **the research practice evolved towards bigger variety** (i.e., encompassing a growing number of topics and sub-topics⁸). **However, GES remained quite stable**⁹. Is it grounded in a deep conservatism of IS seniors (see King and Lyytinen 2006 on this point)?

Then, given the growing number of IS journals over the last decade, one could expect to see GES increasingly emphasizing ambitions in order to accentuate journal's focus and strengthen their position among competitors. However, even such trend we could not observe.

Lastly, we found some support for inward orientation of the IS journals - GES focus mainly on IS issues and are not used as guidelines towards further extending the scope of IS research to other fields.

In an attempt to summarize our findings in a more systematic manner, we look at GES as an espoused theory that provides justification for the collective action of the IS community – GES point at the expected topics and boundaries of IS research. Teo and Srivastava (2007) propose that a collective action can be characterized along three dimensions, namely its

⁸ Such as epistemology which was not at the forefront of IS research a couple of years ago.

⁹ This does not mean that the GES have not been changed. Almost all GES we have been rewritten between 1997 and 2007.

periphery (what are our peripheral and central objects of IS research?), process (what are we doing?), and perspective (what are we aiming at?). Having adopted the three-dimensional approach to assessment of collective action (Teo and Srivastava, 2007), we can conclude that on the periphery dimension, espoused theories do not draw clear boundaries between the core and the periphery, hence discourse seems to be more inclusive than exclusive. Regarding the process dimension, espoused theories remain quite stable and GES maintain poorer lexical and thematic discourse on the field. With respect to the dimension of perspective, GES are academia-oriented. Few editorial statements mention 'managers', 'practitioners', 'actionable knowledge', or 'usefulness'.

This research contributes to the literature in two ways. First, it offers a way to analyze the espoused theories of IS beyond a meta-analysis of leaders' visions. Surprisingly, GES and 'official' documents of the community have barely been analyzed in recent studies of the IS field. We believe that this reflexive exercise could be interesting for the study and management of our identity. Second, it has been a way to illuminate the diversity of the 'official' IS domain. Whereas some journals emphasize an open exchange with other scientific fields, others are more exclusive and stress an intra-community focus. Some journals demand a general ambition (theoretical or empirical), whereas others emphasize the importance of the implementation of research methods in the creation of knowledge. Indirectly, this work is also a way to make sense of positioning of IS publications.

4.2. Limitations and Avenues for Further Research

This study has several limitations. First, the study suffers from the ambivalent functions and understandings of GES. Whereas this work regards GES as reflecting espoused theories, GES may also be considered as a managerial tool to market a journal. Second, the lexicometric analysis applied in this work is based on the assumption that the importance of a word and an idea is linked to its frequency in a given text (Bardin, 1998). This assumption can be and has been questioned (Bardin, 1998). Third, selecting GES of mainly A and B journals may be misleading; a broader sample would have included more niche outlets, which could have led to different results.

Further research could extend the sample of IS journals to include more outlets and publications, also targeting niches of the IS domain. Further research may also want to include IS practitioners' vision of IS and, for instance, investigate which espoused theories IS managers have in mind, how they define organizational IS, how they theorize it, and finally how their views differ from those of academics. Lastly, beyond GES, conference call for papers may also be useful to trace the 'official line(s)' of IS. On this basis, IS researchers could even develop a critical agenda of the official discourse (see Grey and Willmott, 2005). This may result in the emphasis of structures of domination or very implicit hypotheses about IS practices.

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Appendices

Appendix 1: Selected IS journals (see www.aisworld.org/csaunders/rankings.htm)

Nº	Journal Code	Journal Name	Average Rank Points	1997 GES found	2007 GES found
1	MISQ	Management of Information Systems Quarterly	1.11	PV	PV
2	ISR	Information Systems Research	2.67	PV	PV
3	CACM	Communications of the ACM	2.75	OW	PV
4	JMIS	Journal of Management Information Systems	4.86	PV	PV
5	AI	Artificial intelligence	6.00	OW	PV
6	DSJ	Decision Sciences	6.43	PV	PV
7	IEEETIP	IEEE Transactions on image processing	8.75	OW	PV
8	IEEETIE	IEEE Transactions on industrial electronics	NR	OW	PV
9	EJIS	European Journal of Information Systems	10.17	PV	PV
10	DSS	Decision Support Systems	10.67	PV	PV
11	IEEESw	IEEE Software	11.00	OW	W
12	I&M	Information and management	11.89	OW	PV
13	ACMTDS	ACM transaction on database systems	12.00	OW	PV
14	IEEETSE	IEEE transaction on software engineering	12.17	PV	W
15	ACMTrans	ACM transactions	13.00	PV	PV
16	JCSS	Journal of computer and system sciences	13.00	OW	PV
17	IEEETSMC	IEEE Transact. on Systems, Man, and Cybernetics	14.00	OW	W
18	ACS	ACM Computing surveys	15.71	PV	PV
19	JComp	Journal on computing	16.00	PV	PV
20	IJEC	International journal of electronic commerce	17.50	PV	PV
21	JAIS	Journal of the AIS	17.75	OW	W
22	IEEETC	IEEE Transactions on Computers	18.00	OW	W
23	ISF	Information Systems Frontiers	18.00	PV	OW
24	ISJ	Information Systems Journal	18.71	PV	PV
25	JGIM	Journal of global information Management	19.00	PV	PV
26	DATABASE	The database for advances in information systems	19.57	OW	OW
27	IS	Information Systems	20.00	PV	PV
28	JACM	Journal of the ACM	20.40	PV	PV
29	HCI	Human Computer interactions	20.67	OW	PV
30	IT&P	Information Technology & People	21.00	PV	PV

* Legend: W: Publisher's website; PV: Paper-based version we received through libraries, administrative managers of the journal or Editors in Chief; OW: Other way (e.g., direct contacts with Associate Editors or colleagues)

Appendix 2: Example GES and its coding (MIS Quarterly 2007 without irrelevant passages) [CONT-CRIT:] Research Articles

Submissions to the Research Articles department should offer a contribution that is sufficiently original and significant so as to warrant a full-length article for the authors to develop and present their argument have a strong grounding in theory, whether it is a new theory the authors are advancing or an existing theory the authors are testing, refining, or challenging

[CONT-MIX:] Submissions to the Research Articles department typically have theoretical and empirical components, but pure-theory submissions are also appropriate.

[CONT-PURP:] Most submissions to, and most papers published in, the MIS Quarterly are in the Research Articles department.

[AUD-AMB:] Issues and Opinions

This department provides a forum for the communication of well-developed and well-articulated position statements concerning emerging, paradoxical, or controversial research issues.

[CONT-CRIT:] An Issues and Opinions article may be described as a rigorously argued and scholarly editorial. Issues and Opinions submissions should open new areas of discourse, close stale areas, and/or offer fresh, insightful views on research topics of importance to the information systems field. They should identify the issue(s) in terms that are easy to understand provide appropriate conceptual frameworks for the issue, offer opinions and supportive arguments, and describe the implications of these opinions for research, practice, and/or teaching

[CONT-TYPEPAP:] Research Note

This department provides a forum for two types of concise contributions:

[AUD-AMB:] Commentaries that relate to an important methodological issue (or issues) associated with a published MIS Quarterly article.

[CONT-CRIT:] The connections between a Note's content and earlier articles published in the MIS Quarterly must be clear. Published Notes ought to arouse controversy and encourage dialogue on an important methodological issue. Incremental contributions of an empirical nature that relate to important topics that appear frequently in the MIS Quarterly.

[CONT-TYPEPAP:] Research Essay

Occasionally, manuscripts are received that solely address methodological issues but apply a depth of exposition and analysis that goes beyond the level normally associated with a 'Note'. This department provides a forum for such submissions.

Theory and Review: Submissions to this department promote research by surveying and synthesizing prior theoretical and empirical research. They set directions for future research. They also act as a repository for the knowledge that has been accumulated on an important topic within the information systems field and advance theory in that topic area.

[CONT-CRIT:] Types of Papers the MISQ Does Not Publish

The MIS Quarterly does not publish the following types of papers: descriptions of information systems applications, methodologies, or practices where these descriptions are atheoretical or purely formal; replication of prior topics unless the replication provides important new insights about a topic; criticisms of prior research unless the criticisms provide important new insights about a topic; descriptions of instrument development or refinement; research or commentaries on professional topics (e.g., journal rankings, promotion and tenure criteria, employment practices); research or commentaries on educational topics; and definitions, frameworks, or taxonomies.

The MIS Quarterly also does not publish papers that address topics that are only tangentially relevant to the information systems field. Before submitting their paper, authors should evaluate whether their paper contributes primarily to knowledge in the information systems field or primarily to knowledge in another field. If the paper primarily contributes to knowledge in another field, it should be submitted to journals in that field because that is where the article will have its greatest impact. Authors should clearly and persuasively state the contribution to the information systems discipline made by their paper.

Appendix 3: Thematic Dictionary used for GES coding

Category	Sub-Category	Definition
TOPIC	[DES]	Technology design (parameter-setting, conception, development, modelling)
Main technological and managerial topics covered:	[USE]	Adoption, use and management (investment, project management, maintenance, training, communication, appropriation, evaluation, strategy) [USE]
- Descriptive/normative discourse (Why versus how?)		
- Mono-cultural/pluri-cultural		
- Exhaustive/non-exhaustive	[MIX]	Mix of both topics [MIX] (if GES does not deal explicitly with topic, we used the code 'MIX')
- Compared to other (affiliated?) journals or not		
METH	Nature: Qualitative [QUAL], quantitative [QUANT] or combination [COMB]	Nature of data and data treatment
Expected research and methodologies and epistemologies	Time scope: Transversal [TRANS] or longitudinal [LONG]	Temporal orientation of the research
	Content: Case [CAS], survey [SURV], experiment [EXP], action research [ACT], other [OTHER] which means both others and mixture	Overall research strategy
	Epistemological stance: positivist [POS], interpretative [INT], critical [CRIT], mixture [MIX]	Vision of reality
AUD	Audience scope: worldwide [SCOWORLD] or spatially targeted [SCOTARG]	Target audience (global, i.e., without precise focus, or targeted)
Audience and mission	Audience profile (both potential authors and readers): practitioners [PRAT], academic [ACA], or both [MIXPRO]	Profile of expected readers
	Journal ambition [AMB] with dimensions such as high quality or innovation	Sections describing journal ambitions
	Frequency of publication [FREQPUB]	Monthly, bi-monthly, quarterly
	Affiliation, relationship with broader official society or organization [AFF]	E.g., affiliation with professional or academic networks
CONT	Nature: methodological [METH], Theoretical [THEO], EMPIRICAL [EMP] or mixed [MIX]	Nature of expected contributions
Expected contributions:	Quality criteria for doing and writing research, i.e., good practice [CRIT]	Evocation of good practices
Dimension:	Types of papers [TYPEPAP]	Type of expected papers (full paper, research note, research in progress, book review, invited paper)
- Criteria for publication: inclusive [CRIINC] or exclusive [CRIEXC]	Boundaries of contribution: intra IS field [INTRA] or extra IS field [EXTRA]	Explicitly invited contributions from other fields (yes / no)
- Research in progress (yes/no)		

General purpose and management of the review [PURP]	Main objectives and management of review process
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Appendix 4: Words with Relative Frequency in 1997 and 2007

Category	Groups of Words	Relative Frequency (%)		
		1997	2007	Δ
IS topics (TOPIC)	System(s), information	3.74	2.69	-1.05
	Technolog(y/ies), computer(s), software, application(s), design(s), development(s), data	3.06	2.58	-0.48
	Management, organi(s/z)ation(s/al), decision(s), DSS(s)	2.37	1.57	-0.80
	Field(s), area(s), theor(y/ies)	0.96	1.44	+0.48
Expected contribution (CONT)	Research, journal(s), paper(s), article(s)	1.78	2.55	+0.77
	New	0.32	0.37	+0.05

Appendix 5: Words with Changing Relative Frequency between 1997 and 2007

Category	Word	Relative Frequency (%)		Δ
		1997	2007	
IS topics (TOPIC)	Intelligen(t/ce)	0.26	0.10	-0.16
	Process(es)	0.30	0.09	-0.21
	Database(s)	0.10	0.70	+0.60
Audience (AUD)	Professional(s)	0.38	0.07	-0.31
	Societ(y/ies)	0.42	0.10	-0.31
Methods (METH)	Survey(s)	0.10	0.40	+0.30

Appendix 6: Words Used Only in One Year with Relative Frequency

Category	Word	Relative Frequency (%)		
		1997	2007	Δ
Expected contribution (CONT)	Acoustic(al), aerospace, automotive, 0.75	0.75	0.00	-0.75
	biocybernetics, biological, biophysical, ecological, economy, energy, entrepreneurship, HCI, mathematics, mechanical, medical, physics, physiological, psychologi(cal/ists), semantics, semiology, socioeconomic, sociology			
	Astronomy, cybernetics, genetic, 0.00	0.00	0.12	+0.12
	geographic, geophysics, history, microscopy, numeric(al), radar			
Audience (AUD)	Africa, Asia, Europe, Latin, North, Pacific 0.00	0.00	0.06	+0.06
	Ethnicities, multinational, nation, regions, 0.00	0.00	0.11	+0.11
	subcultures.			