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Approaches and Methodologies for Strategic Information Systems Planning: An Empirical Study in Australia

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Approaches and Methodologies for Strategic Information Systems Planning: An Empirical Study in Australia

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Abstract

Based on data obtained from a large scale survey of Australian companies, this paper examines the use of Strategic Information Systems Planning (SISP) approaches and methodologies. Generally, studies on SISP approaches are conceptual and they do not provide much for practitioners. In this study, analysis is done on the variable level which brings to the surface the normally hidden content of the relationships. New relationships between the SISP approaches, SISP success and several organisations' attributes are discovered. It is found that 'the borders and boundary lines' which distinguish approaches have begun to blur and that the most popular SISP methodologies are not the most successful ones. SISP practitioners may benefit from knowing that emerging methodologies such as Fuzzy Cognitive Maps and Information Engineering can improve the success prospects of SISP. Many findings of significant importance to SISP practitioners, in the context of various industries, are presented.

Keywords

SISP approach, SISP Methodology, SISP success, SISP objectives.

INTRODUCTION

IT/IS strategic importance has not diminished because a global trend of information availability to everyone, whenever it is needed, and anywhere (Szántó 2005). This trend is associated with needs to provide solutions to current problems based on intelligent information like business intelligence, security, etc. Therefore, Strategic Information Systems Planning (SISP) is still needed to produce a strategic plan that addresses the future needs for IT/IS resources in accordance with the business objectives.

Within the IT/IS landscape, theoretical research is well advanced but in many aspects still lags behind practical needs as SISP is addressed by many theorists and few practitioners. The content of the relations among SISP constructs on the variable level still remains hidden because of the conceptual nature of SISP studies. SISP is a dynamic, evolving activity and revisiting the usefulness of propositions for practice is very important as it helps practitioners to learn from experience in other organisations. Therefore, obtaining feedback from current SISP practice should be a continuous exercise (Galliers 1987) but such studies took place some time ago (Earl 1993; Flynn and Goleniewska 1993; Galliers 1987; Wilson 1989).

This study focuses on empirical analysis of diffusion and adoption of the five SISP approaches: Business-Led, Method-Driven, Administrative, Technological, and Organizational, defined by Earl (1993) as well as their current relationship to SISP objectives, company size and SISP success. All relationships are assessed on a variable level. Also, this study tries to help SISP practitioners by finding relationships between used methodologies and SISP success in the context of various industries. The rest of paper proceeds as follows. The next section is the literature overview of the most used SISP approaches and methodologies, followed by

analysis of data based on a survey of 260 Australian companies. Finally, a summary of the survey results, limitation and the possibilities for further research is presented.

APPROACHES TO SISP, SISP METHODOLOGIES AND SISP SUCCESS

There is a substantial body of literature on SISP approaches (Earl 1993; Segars et al. 1998; Ward and Griffiths 1998) and to avoid repetition, this section does not analyse or compare the different approaches. The aim is to present some key stands from SISP literature to be able to form a context within which the survey results may be interpreted. An approach refers to a set of procedures, techniques, user-IS interactions, special analysis, and random discoveries, Earl (1993, p. 7). As there is no industry standard for SISP, the SISP literature reports a plethora of approaches. Still, the majority of SISP approach studies revolve around Earl's (1993) theory. Earl revealed valuable conclusions about five different approaches: Business-Led, Method-Driven, Administrative, Technological, and Organizational. He found that the Organizational approach is superior to all other approaches.

However, whilst the Organizational approach may in general be the most effective, there may be circumstances in which other approaches are more appropriate (Doherty et al. 1999; Willcocks 2000). Somewhat in contradiction to this general conclusion, Segars et al. (1998) suggested that there is a single approach, 'rational adaptation', which is the most effective way for applying SISP. This approach embodies the principle of rationality through a high level of comprehensiveness, formalisation, focus, through top-down planning (flow), and adaptation. The same authors in 2005 re-confirmed their previous findings, stating that the balanced approach that reconciles seemingly contradictory 'rational' and 'adaptive' dimensions of SISP planning is a 'best practice' for which organisations should endeavour. Studies like Salmela et al. (2000) suggested that an informal, incremental approach to SISP could be less adequate in a turbulent environment. This is quite an opposite conclusion to many findings which warned that comprehensive planning can cost too much and take too long in a turbulent environment (Hartono et al., 2003). To address both, modern business practice and thinking, new approaches to IS planning are offered like the approach based on critical systems thinking (Córdoba and Midgley 2006).

One of the major issues on the IS planning agenda is choosing the right methodology (Lederer and Sethi 1992) to enable the IS team to plan and track its SISP activities. A SISP methodology is comprised of one or more techniques where each technique is defined by a set of practices, procedures, and rules. Generally, the use of more than one methodology is preferred. The main methodology selection criteria include resource availability, methodology/technique complexity, internal policy, historical reasons, a preferred supplier, familiarity, etc. (Betts 1999). The use of automated tools also helps planners to conduct SISP in a structured and more efficient way.

Any of packaged methodologies will require customization for a client's specific requirements. A number of Australian organization have used a few planning methodologies, and still were in the process of choosing the right methodology (Cerpa and Verner 1998). The levels of IS systems infusion and diffusion (Sullivan 1985) dictate which methodology will be more appropriate to use. Systems infusion is described as the degree of IT influence in terms of importance, impact, or significance; and systems diffusion as the degree to which technology has been dispersed throughout the company.

The use of the wrong methodologies significantly contributed to SISP failures and there was a call within the SISP literature for improving its methodology (Reich and Benbasat 2003). SISP approaches and methodologies are assessed in the light of SISP success. SISP success should not be measured by financial criteria because of inability to isolate the effect of SISP as one of many contributors to financial performance of an organisation (King 1988). Dimensions of SISP success were examined and suggestion is to use either of these dimensions: improvements in SISP capability or fulfilment of SISP objectives (Warr 2006). This study uses fulfilment of SISP objectives as a measure of SISP success.

Does it matter which approach is to be adapted and followed? Does SISP practice embrace SISP theory? Is there any significant relationship between used approaches/methodologies and industry type? Are there approaches/methodologies more commonly used in the big organisations than in small and medium enterprises? This study, based on empirical data, will try to find answers to these questions.

DATA COLLECTION AND DATA ANALYSIS

This study uses only subset of data collected from an Australian wide survey, conducted in 2003. Small and medium companies were randomly sampled and the top hundred IT companies (MIS 100, 2003) were all included. Targeted key informants were IT executives, as they are usually the most involved in SISP (Segars and Grover 1998). No specific instrument was found to entirely cover the need of the study; therefore the available scales found in the SISP literature are extended or modified where appropriate. The reliability of the measuring instrument is confirmed by applying the Reliability Analysis procedure and Principal Components Factor analysis. Also, content, face and constructs validity is assessed. The questionnaire was pretested and the study

checks that the scales meet construct validity through both the convergent and discriminant validities. Due to the space limitation only a few questions from the questionnaire are presented in Appendix 1.

From a population of 2000 questionnaires sent, a reasonable number of questionnaires (260) with complete data were received, representing a 17.3% response rate. This response rate is considered very high as the chosen method of collecting data usually has a low response rate (Kress 1988). Received responses indicated that about 24% of Australian organisations do not perform SISP at all.

Received data is compared with the levels of planning in Europe and Asia. In Australia, 75.8% of organisations performed some form of IS planning while in Europe this value was 50.4% (Grozniak and Kovacic 2000) and in Asia 63% (Teo et al. 1997). Also, a study of IS planning in 80 companies in Australia was carried on in 1985/1986 (Galliers 1987). The results showed that around 52% of medium-sized and large organisations were involved in IS planning and 26% were considering undertaking an IS planning study. One decade after Galliers' study, Falconer and Hodgett (1996) conducted a similar study. Their results indicated falling interest in IS planning in Australia when compared with the Galliers' study. This study found that organisations that attempt IS planning in Australia in about 17% cases perform Strategic IS planning regularly, 15% of them were developing SISP at the time the survey was conducted, 38% have irregular SISP, while about 31% of organisations have some form of IS planning.

Having 92.0% of respondents being active contributors to SISP, with 81.6% of them having more than 11 years of industrial experience, 89.6% having more than 6 years experience in the IS area, gave full credibility and confidence to the survey answers. The majority of respondents came from the manufacturing environment (18.4%), followed by public administration (11.5%), and banking/financial services (9.2%). Industry types are grouped according to the size of the company. The size of the company is defined as small (annual turnover < \$10 million), medium (turnover between \$10 and \$500 million) and as large for turnover of more than \$500 million. The valid percentages obtained are: 5.7% for small, 62.1% for medium and 32.2% for large companies. About half of the surveyed companies have 100 to 1000 employees and 43.7% of companies have less than 10 IS employees. Only 36.8% of companies have more than 50 IS employees where about half of these companies employ more than 200 IS employees. The literature review reports that SISP increases directly with the total number of employees (Grozniak and Kovacic, 2000; Teo et al. 1997). The existence of relationships (Chi-Square=31.722, df=6, p<0.05) was found in the case of the regular SISP planning. Thus, organisation size in terms of number of employees is a significant antecedent for conducting SISP.

Ranking of SISP Methodologies

The Friedman test confirmed that there is a significant statistical difference between assessed methodologies (Chi-square =954.610, df=25, p<0.001). The average percentage of 'used' and to 'some degree used' together is 76% and 'not used' is 24%. However, Flynn and Goleniewska (1993) reported the 89% use of a methodology or technique in 18 UK organizations. Obviously, the size of the sample should be taken into account when interpreting their results.

This study finds that the highest ranked used methodology is Information System Planning, followed by SWOT analysis and a combination of Bottom-up and Top-down styles (Table 1). Lederer and Sethi (1988) mentioned that Business Systems Planning, Strategic Systems Planning, and Information Engineering accounted for half of the responses to their survey. Premkumar and King (1991) found that the most used methodologies were: Information Engineering (12%), Business Systems Planning (8%), CSF (6%) and Value Chain (6%). Surprisingly, in this study, Information Engineering, Method/1 and 4 Front are in the last positions. Smits et al. (1997) confirmed that methodologies such as BSP were previously used but were abandoned.

This study found that as an average of 6.7 different methodologies per an organisation is utilized in Australian practice. However, the SISP literature statement (Rogerson and Fidler 1994) that the greater the size of the organisation, the greater the tendency to use more methods, has not been confirmed in this study.

SISP Methodologies and SISP Success Relationship

It is important to know the most successful methodologies, i.e. which ones from the list score the highest mean in relation to overall SISP success. SISP success is measured explicitly, operationalised as a single item which measured the respondent's perception of the overall SISP success. Other studies confirmed an insignificant error between the use of a single overall measure of success from the respondent and a multi-item measure (Warr 2006). In comparison with study conducted in 1992 (Lederer and Sethi 1999) the overall satisfaction with SISP increased by 19% (mean 3.48, st.dev. 0.727). Also, SISP success is assessed in regard to the size of a company. The mean values (small 3.00, medium 3.41, large 3.71) demonstrate that SISP success increases with a company's size (Spearman's rho=0.272 at the 0.01 level, 2-tailed).

The mean values (Table 1) show that the most popular methodologies are not the most successful ones. The most popular methodologies are alignment methodologies. However, the most successful methodologies are result oriented (impact) methodologies. The highest success rank is associated with Method/1 and Inside-out planning style. The third and the fourth position are occupied by the Fuzzy Cognitive Maps and the Information Engineering methodology. These methodologies are not in much use.

Table 1. Relationships Between SISP Methodologies and SISP Success

	SISP Success		Methodology Usage		
	Mean	Spearman's rho	Rank	Mean	Std. Dev.
Method 1	5.00	0.28**	25	1.06	0.32
Inside-out	4.50	0.35**	18	1.17	0.53
Fuzzy Cognitive Maps	4.33	0.31**	20	1.15	0.44
Information Engineering	4.33	0.18*	22	1.10	0.40
Ends Means Analysis	4.20	0.28**	19	1.17	0.51
Information Engineering WorkBench IEW	4.00	0.02NC	24	1.07	0.33
Executive Information Planning	3.92	0.20**	11	1.45	0.73
Value Chain Analysis	3.90	0.20**	16	1.30	0.66
Current portfolio evaluation	3.87	0.19**	9	1.46	0.77
Staged Approach	3.84	0.20**	8	1.57	0.83
Resource Life Cycle	3.83	0.27**	14	1.38	0.72
Technology assess. IS infrastructure review	3.82	0.26**	5	1.72	0.84
Top-down	3.81	0.30**	4	1.80	0.87
Business Portfolio Analysis	3.80	0.19*	10	1.46	0.77
Balanced Scored analysis	3.79	0.28**	12	1.44	0.76
BIA Integration Technique	3.78	0.18*	15	1.31	0.65
IS Investment Strategy	3.77	0.20**	13	1.43	0.74
Bottom-up	3.76	0.25**	7	1.61	0.80
Combination bottom-up and top-down	3.74	0.30**	3	1.85	0.92
SWOT analysis	3.74	0.27**	2	1.95	0.91
Business Systems Planning	3.73	0.32**	6	1.67	0.86
Information Systems Planning	3.69	0.31**	1	1.97	0.88
Information Quality Analysis	3.63	0.18*	17	1.28	0.62
Other	3.50	0.17*	21	1.11	0.44
BI Characterization Study	3.00	0.09NC	23	1.08	0.31
4 Front	N/A	-0.08NC	26	1.01	0.11

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
NC Correlation is not statistically significant. N/A no entries for 'used' methodology

On the other hand, the most popular Information System Planning is the fifth from the bottom of the success list. For decades, SISP was not a successful process. This study confirms that the methodologies used were not so successful in Australia (satisfied 55.2%, neutral 33.3%, dissatisfied 11.5%), but still they are more successful in comparison to the results reported in other studies (i.e. Lederer and Sethi, 1999). The reason why the most popular methodologies are not the most successful ones could be due to the fact that organisations are not able to diagnose (measure) the unsatisfactory effect of methodologies they employed. The SISP measurement has been reported as one of the critical issues and the need for the improvement of measurement is also

acknowledged in the SISP literature (Willcocks, 2000; Sweat, 2002). SISP practitioners may benefit from knowing that emerging (result oriented) methodologies such as Fuzzy Cognitive Maps and Information Engineering can improve the success prospects of SISP.

SISP Methodologies, Industry Type and Company Size Relationships

The correlation statistics revealed that only the Information Systems Planning and Balanced Scored analysis methods have a statistically significant association with the Industry type variable at the macro level (Spearman's rho=0.19 at the 0.05 level, 2-tailed). When the correlations between methodologies and industry type are assessed on an item level more insights into these relationships are obtained. These results are incorporated with crosstabulation statistic and presented in Table 2. (Note: the table content limited due to the paper size limitation). This table reveals that industries like whole sale trade and retail trade do not use a methodological approach when conducting SISP. Their experience with SISP is negative or neutral, which confirms the importance of following a structural approach when conducting SISP. For the public administration industry, the use of Ends Means Analysis, Current Portfolio Evaluation and Information Systems Planning are strongly related with SISP success. On the other hand, the banking and finance industry is least associated with SISP success if following the Business Systems Planning methodology. Also, the use of an extensive number of different methodologies across the industry type does not guarantee SISP success. An example for this is the Consulting and Technical services.

The exposure to over 20 different methodologies during the SISP processes yields only the 3.14 score (on a scale 1 to 5) for this industry type. In contrast, the Electricity and Gas supply industry utilises only five different methodologies and their SISP success mean is 4.00. These results are suggestive, but not conclusive as SISP success does not depend solely on methodologies used. In general, an average of 13.4 methodologies is used across the same industry and as previously stated, an average of 6.7 different methodologies is applied per an organisation.

Typically, small and large organisations tend to use different methodologies. Most of the relationships between the SISP methodologies and company size are not statistically significant. Figure 1 depicts the most successful methodologies against the company size. For example, the least used Method/1 packaged methodology is associated with the highest SISP success in large organisations. This method is expensive and hard to use even though it is supported by automated tools. Also, the Current portfolio evaluation methodology, ranked at the 7th position for its use, is one of the most successfully applied SISP methodologies in large companies. Medium sized companies were most successful in SISP when they used Bottom-up planning style and implemented Technology assessment IS/IT infrastructure review methodology. Generally, small companies have negative or neutral satisfaction with SISP. They favour bottom-up or a combination of bottom-up and top-down planning and use of Business portfolio analysis methodology.

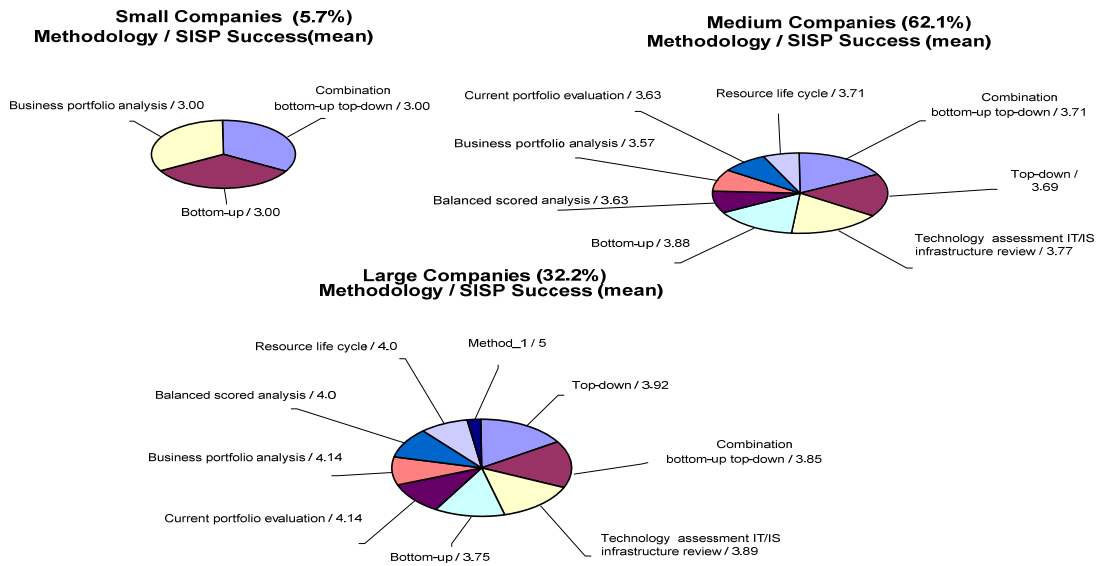


Figure 1: Company Size, Methodology and SISP Success Relationships

Table 2. Means and Crosstabulation between some SISP Methodologies, Industry Type and SISP Success

	Consulting and technical services	Mining or quarrying	Electric and gas supply	Communication	Public administration	Transport and storage	Education	Research and development	Wholesale trade	Retail trade	Construction	Agriculture forestry or fishing	Insurance	Banking Finance	Hospitality persnl and other services	Health	Retail	Manufacturing	Other
IS Planning	3.45%	1.15%	0%	0%	10.34%	2.30%	3.45%	1.15%	0%	0%	1.15%	1.15%	1.15%	6.90%	2.30%	4.60%	3.45%	12.64%	4.60%
SISP Success: (%), Mean ***		50%*			40%* 3.88							50%* 4		25%* 5			66.66%* 4	50%* 3.57	
SWOT analysis	3.45%	1.15%	0%	1.15%	8.05%	2.30%	3.45%	0%	0%	0%	1.15%	1.15%	1.15%	8.05%	3.45%	5.75%	3.45%	9.20%	3.45%
SISP Success: (%), Mean ***		50%* 5										50%* 4					67%* 4		
Techn. Assess. IS infr. review	4.60%	1.15%	1.15%	1.15%	8.05%	2.30%	3.45%	0%	0%	0%	1.15%	1.15%	1.15%	3.45%	3.45%	1.15%	3.45%	8.05%	2.30%
SISP Success: (%), Mean ***		50%*										50%* 4		25%* 5		14%* 5	67%* 4	31%* 3.80	
Business Systems Planning	3.45%	1.15%	1.15%	0%	5.75%	2.30%	2.30%	0%	0%	0%	0%	1.15%	0%	6.90%	3.45%	3.45%	2.30%	5.75%	2.30%
SISP Success: (%), Mean ***		50%* 5										50%* 40		38%* 3		29%* 4	67%* 4	25%* 3.50	
Bottom-up	2.30%	1.15%	0%	0%	10.34%	1.15%	3.45%	1.15%	0%	0%	1.15%	0%	1.15%	5.75%	2.30%	2.30%	1.15%	6.90%	1.15%
SISP Success: (%), Mean ***	14.28%* 3.50	50%*												50%* 4.50					
Busnss Portfolio Analysis	1.15%	0%	1.15%	0%	4.60%	1.15%	5.75%	0%	0%	0%	0%	0%	1.15%	5.75%	2.30%	0%	1.15%	3.45%	1.15%
SISP Success: (%), Mean ***														50%* 4.50					
Current portfolio eval.	1.15%	1.15%	0%	1.15%	4.60%	1.15%	5.75%	0%	0%	0%	0%	0%	1.15%	3.45%	2.30%	0%	2.30%	3.45%	1.15%
SISP Success: (%), Mean ***		50%*			20%* 4		29%* 4.50							25%* 4.33			67%* 4		
Executive Info Planning	4.60%	0%	1.15%	0%	2.30%	0%	1.15%	0%	0%	0%	0%	1.15%	0%	5.75%	3.45%	3.45%	1.15%	4.60%	2.30%
SISP Success: (%), Mean ***												50%* 4		38%* 5		14.30%* 3		19%* 4	
Balanced Scored Analysis	0%	0%	0%	0%	4.60%	0%	2.30%	1.15%	0%	0%	0%	1.15%	0%	6.90%	0%	0%	3.45%	5.75%	2.30%
SISP Success: (%), Mean ***												50%* 4						25%* 3.50	
...
SISP Success (Total Mean) ** /std. deviation	3.14 0.36	4 1.15	4 0.00	3 0.00	3.60 0.68	4 0.00	3.43 0.76	4 0.00	2.50 0.93	3 0.00	3 0.00	3.50 0.58	3 0.00	3.88 0.81	3.50 0.93	3.43 0.94	3.67 0.52	3.56 0.62	3.80 0.42

Note: Methodology crosstab percentage calculated only for positive responses ('to some degree used' and 'used') and shown for limited number of methodologies. SISP success percentage layer calculated for positive responses (satisfactory and very good). Methodology Scale: 1-not used, 2-to some degree used, 3-used; SISP Success scale: 1-very poor, 2-moderate poor, 3-neutral, 4-satisfactory, 5- very good * Percentage calculated only where correlation is significant. **SISP success total mean calculated for all responses (methodology: 'not used', 'to some degree used' and 'used').*** SISP success mean calculated only for methodology where response was 'used'. Note: Where methodology and SISP success values are constants no statistics are computed.

SISP Approach and SISP Success Relationship

The questionnaire deployed five approaches (Earl 2000) in an explicit form. A single question is used as a measure of the respondent’s perceptions of the SISP approach. The aim was to assess how widely this theoretical nomenclature is recognised in practice. The results received are unexpected. 49.74% of respondents did not use (or recognise) any of Earl’s approaches, 31.08% indicated some use, and 25.18% indicated full use of these approaches. The Administrative approach scored the last position and the most used approach is Business Led (Table 3). No alternatives were specified, with the exception of two respondents who specified ‘Other’ as ‘Budget constraints’ and ‘SAP modules’. This also indicated that ‘approach’ terminology and meaning was unknown. Further analysis showed that 20.11% of the surveyed organisations used two different approaches simultaneously and 14.37% used a combination of three or more approaches. The study found that about 25% of the population use other than Earl’s approaches and only 25.28% of them did not use any formal approach. In general terms, SISP is somewhat evolved and Earl’s approach categorization is confirmed in Australian practice. Work done by Warr (2006) has similar findings for the UK environment.

Correlation between the factors (SISP approach and SISP success are unidimensional factors) is 0.358, at the 0.01 level. Also the Friedman Test (Chi-square = 86.498, df =4), significant at the 0.01 level shows that the approaches do not have equal potential to influence SISP.

Table 3. SISP Approaches and SISP Success Relationships

	Descriptive Statistic					SISP Success			
	1	2	3	Mean	Std. Dev	Mean			Spearman's rho
						1	2	3	
Organisational	41.38%	35.63%	22.99%	1.82	0.78	3.14	3.77	3.65	0.33*
Business-Led	34.48%	25.86%	39.66%	2.05	0.86	3.17	3.71	3.61	0.23*
Administrative	59.77%	29.89%	10.34%	1.51	0.68	3.29	3.85	3.56	0.29*
Method Driven	60.92%	21.84%	17.24%	1.56	0.77	3.32	3.79	3.67	0.27*
Technological	47.13%	32.18%	20.69%	1.74	0.78	3.27	3.71	3.61	0.25*

* Correlation is significant at the 0.01 level (2-tailed).
1 Not Used, 2 To Some Degree Used, 3 Used

Table 3 shows that values of the ‘to some degree used’ scale are higher than for ‘used’ scale. This phenomenon leads to the confirmation that combinations of different approaches are more appropriate to use as SISP success is higher there than in the case of a single approach use. This observation can be also interpreted that ‘the borders and boundary lines’ which distinguish approaches have begun to blur. This implies that a new approach which combines the best of the five Earl’s approaches should be defined. The most successful combination is Organisational and Business-Led and then Organisational, Business Led and Method Driven combination.

In addition, a relationship between the SISP approach and SISP success factors is confirmed by SEM. An excellent data fit of the model, shown in Figure 2 and Table 4 indicates a strong positive relationship between SISP success and SISP approach. The study does not discuss the recommended cut off values for fit indexes because they are widely reported in the statistical literature (Byrne 2001).

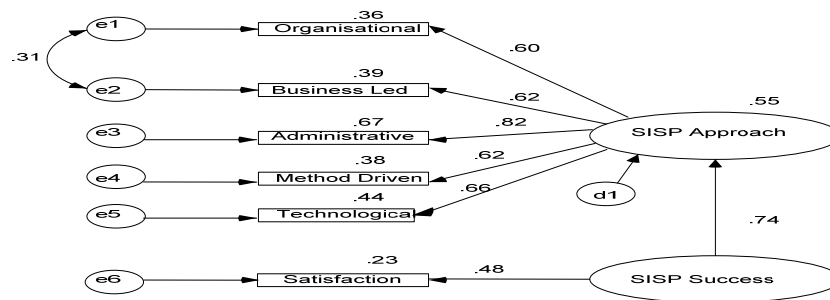


Figure 2: SISP Success/Approach: Measurement and Structural Model.

It was found that there were no parameters in this model representing crossloading and that only the error covariance between e1 and e2 made substantive sense. The two error correlations appear to elicit responses reflective of the current trend of the use of an Organisational and Business-Led combination. This substantiated

rationale gave us the bases for the inclusion of the error covariance between Organisational and Business-Led items.

Table 4. SISP Success/Approach Structural Model Fit Summary

Model	χ^2	DF	P	χ^2/DF	RMR	GFI	AGFI	NFI	RMSEA	CFI
SISP	7.98	8	0.435	0.99	0.017	0.985	0.96	0.97	0.000	1.00

A clear indication of SISP approach success can only be assessed in a situation where an approach is clearly ‘used’. Thus, by measuring means for the ‘used’ scale only (Table 3), quite different results are obtained. Figure 3 indicates that there is no big difference in the means between approaches. A small lead of the Method driven approach came as a surprise. Earl (2000) found that the Method Driven and Administrative approaches shared the 4th position; the Business-Led approach was in the second position while the Technological approach came in the third position. This study finds that the Business and Technological approaches share the third position. In both studies, the Administrative approach kept the last position.

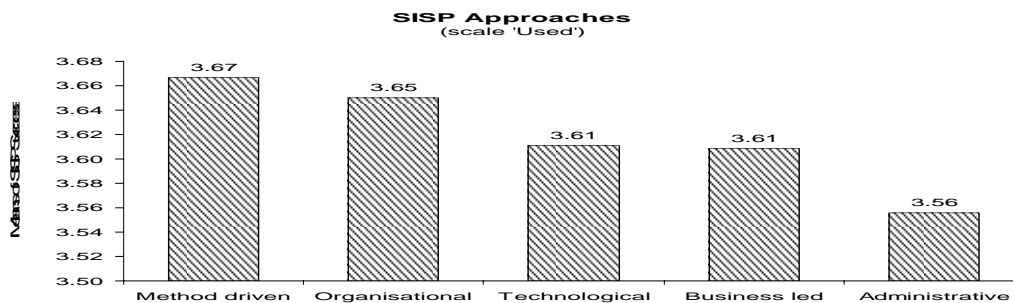


Figure 3: SISP Approaches and SISP Success (means)

In addition, this study explored SISP approaches and SISP success means for only ‘regular’ performing SISP organizations. The rank order was very similar: the first and second positions were kept, the Business led approach came third, while Technological and Administrative approaches shared the fourth position. In an effort to understand why the Method driven approach can help SISP more than others, the following sentence stands out in regard to the Method Driven approach: ‘...formal strategy studies could leave behind embryonic strategic thrusts, ideas waiting for the right time, or new thinking that could be exploited or built upon later in unforeseen ways’ (Earl 2000, p. 227). Maybe that right time is already here.

This study takes a step further; it investigates the covariance between these five approaches. This reveals emerging relations between the approaches. The covariance between Administrative and Technological, and between Organizational and Business-Led approaches is strongest. Administrative approach has a strong influence on Organizational and other approaches. Certain overlapping between approaches has been reported in the SISP literature but such a strong influence of the Administrative approach has not been reported so far. This could be an indication that organizations now ‘value’ more a detailed IS planning and that every approach has some ‘administrative’ elements like identifying ‘where IS/IT is most critical in meeting short to medium-term needs’ (Ward and Peparad 2002, p. 125). Also, the Administrative approach often results in systems that are implemented (Powell and Powell, 2004). Generally speaking, a strong covariance between the SISP approaches may indicate the evolving nature of SISP practice: organizations apply more than one approach and they try to take the best from the different approaches to tailor for their needs. This view is confirmed by the explicit survey statistics which shows that only 55.2% of respondents are satisfied with the current approach and 11.5% are agreed or strongly agreed that the approach followed was not satisfactory. Others (33.3%) are undecided. Also 23% of organizations are considering changing the SISP approach to improve SISP.

SISP Approach Relationships with SISP Objectives, Company Size and IS/IT Infusion/Diffusion

It has been suggested that different combinations of SISP objectives are associated with different SISP approaches (Earl 1993). This study confirmed the existence of that relationship (Spearman’s rho 0.438, significant at the 0.01 level). The mean values indicate that organisations do not have a single predominant SISP objective. Still, the most distinct SISP objective is enabling existing business strategies, followed by improving customer satisfaction and enabling competitive advantage through superior capabilities. This rank revealed that Australian organisations do not consider the strategic relevance of IT as the key objective.

This study found that generally, there is no significant relationship between the SISP approach and the company size. The tendency that large companies more often chose the Business-Led approach is due to chance and does

not reflect reality in this sample. Only the relationship between the Technological approach and the company size is significant at the 0.05 level. Thus, it could be said that the selection of a SISP approach in general is not governed by company size.

The existence of a relationship between IS/IT infusion/diffusion and SISP approaches is tested and found to be mainly of not statistical significance. A significant but negative relationship was found between Organisational approach and 'distributed and critical for business' IS/IT architecture. Also, this approach is positively associated with 'centralised and critical to the business' IS/IT architecture. In addition, Method Driven approach is related to the centralised IS/IT architecture; positively when it is not critical to the business and negatively in the case of critical dependency. The overall result indicated that the underlying data do not support this type of relationship.

SUMMARIES AND CONCLUSIONS

The results of the research survey indicated that only about half of Australia's organisations are satisfied with the current SISP approach, which is a strong indication for a need for practical guidance as to the appropriateness of applied approaches and their combinations. This study offers that direction and fulfils the aim of bringing to the surface the normally hidden content of the relationship on an item level by empirical testing the existence of those relationships. An important contribution to SISP theory is the empirical confirmation of prior works and the identification of new relationships. During data analysis, the study tested a significant number of relationships which could all take a form of formal hypothesis. This study found that a combination of SISP approaches is always more successful than implementation of any one approach alone. Even though the combination of Organisational, Business Led and Method Driven approaches appeared to be the most successful, it may not be so relevant for SISP practice. This study would like to direct future theoretical efforts to unification of all SISP approaches into one approach which will integrate the successful elements of each approach for each industry type. In other words, time and effort should be spent in identifying the successful elements of each methodology and their combinations. Therefore, a future area of investigation could be a closer look at the reasons for success/failure of methodologies for each industry type.

This study found that the most popular methodologies (Information Systems Planning and SWOT analysis) are not the most successful ones. Emerging methodologies such as Fuzzy Cognitive Maps and Information Engineering which are result oriented methodologies could improve the success prospect of SISP. Considering the success of the Inside-out style, it could be suggested that this planning style could be more aggressively followed as it promotes the identification of new opportunities. This style is at least four times less exploited than other styles. This is a reflection of the current situation in Australian SISP practice, where SISP planning for competitive advantage is still evolving. However, knowing that the time in establishing (and fixing) IT infrastructure is over and that now investments in IT mean investing in the future, the theorists should more aggressively insist and communicate the need for planning of IS systems for competitive advantage. Certainly, too conceptual studies will not appeal to practitioners. The assessment of SISP constructs is an ongoing research task as SISP is a live, dynamic process. Today's important SISP aspects may not be relevant tomorrow.

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APPENDIX 1

Questionnaire (sample questions)

18. Does your organization undertake Strategic Information Systems Planning (SISP)?

- No formal Strategic Information Systems Planning
- Some Information Systems Planning
- Some Strategic Information Systems Planning
- Currently developing Strategic Information Systems Planning
- Regular Strategic Information Systems Planning

21. To what degree, if any, have the SISP approaches listed below been used in your organization:

(1) Strongly Disagree (2) Disagree (3) Neither Agree or Disagree (4) Agree (5) Strongly Agree

- No specific SISP approach has been used
- Organisational
- Business led
- Administrative
- Method driven
- Technological
- Other _____

22. To what degree, if any, have the following methodologies and techniques been used in conjunction with the chosen approach?

(1) Not used (2) To some degree used (3) Used

- | | |
|--|--|
| <input type="checkbox"/> No specific method/technique has been used | <input type="checkbox"/> Bottom-up |
| <input type="checkbox"/> Top-down | <input type="checkbox"/> Combination of above |
| <input type="checkbox"/> Inside-out | <input type="checkbox"/> SWOT analysis |
| <input type="checkbox"/> Information Systems Planning | <input type="checkbox"/> Balanced Scored analysis |
| <input type="checkbox"/> Value Chain Analysis | <input type="checkbox"/> Method/1 |
| <input type="checkbox"/> Summit S & Summit D | <input type="checkbox"/> 4Front |
| <input type="checkbox"/> Information Engineering Work Bench IEW | <input type="checkbox"/> Information Engineering |
| <input type="checkbox"/> Business Systems Planning | <input type="checkbox"/> Business portfolio analysis |
| <input type="checkbox"/> Information Quality Analysis | <input type="checkbox"/> Business Information Analysis & IntegrationTechnique |
| <input type="checkbox"/> Business Information Characterization Study | <input type="checkbox"/> Ends/Means Analysis |
| <input type="checkbox"/> Staged Approach | <input type="checkbox"/> Executive Information Planning |
| <input type="checkbox"/> Information Systems Investment Strategy | <input type="checkbox"/> Resource Life Cycle |
| <input type="checkbox"/> Current portfolio evaluation | <input type="checkbox"/> Technology assessment and IS/IT infrastructure review |
| <input type="checkbox"/> Fuzzy Cognitive Maps | <input type="checkbox"/> Other methodology/techniques: |

23. Please indicate your satisfaction with chosen methodologies/techniques.

(1) Strongly Disagree (2) Disagree (3) Neither Agree or Disagree (4) Agree (5) Strongly Agree

- Chosen SISP approach (and methodologies /techniques) is considered satisfactory
- We are developing new methodology/technique to tailor for our specific needs
- We are considering changing our SISP approach to improve SISP
- We have not been aware of the existence of different SISP methodologies
- Chosen SISP methodology (or lack of it) contributed to failure of SISP

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