Strategy Content Analysis for Service Identification: A Case Study on Government Agencies

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Abstract

In a resource constrained business world, strategic choices must be made on process improvement and service delivery. There are calls for more agile forms of enterprises and much effort is being directed at moving organizations from a complex landscape of disparate application systems to that of an integrated and flexible enterprise accessing complex systems landscapes through service oriented architecture (SOA). This paper describes the analysis of strategies to detect supporting business services. These services can then be delivered in a variety of ways: web-services, new application services or outsourced services. The focus of this paper is on strategy content analysis to identify those strategies that are common to lines of business and thus can be supported through shared services. A case study of a state government is used to show the analytical method and the detection of shared strategies.

Keywords

Service modelling, Service-oriented enterprises (SOE), Business process management, Business strategy, Business-IT Alignment

INTRODUCTION

Enterprise Architectures have been developed for many government levels, from federal (FEAF), to state (GEAF) to local (BCC EAF). Service identification, development and deployment figure prominently in these architectures as means of providing enterprise integration and more agile means of reacting to changes in the machinery of government.

In addition, before, during and after the global financial crisis, the rate of strategic change has increased, requiring more agile methods of formulating, articulating and executing strategy. Pun (2004) notes the wide range of definitions of strategy and the pressures to move more rapidly in strategy formulation and execution. Zachman (1987) and derivative enterprise architecture frameworks such as TOGAF (2010) through their business architecture structure and methods, recognize the relationship between strategy formulation (the business view) and the supporting business processes, but few researchers have been examining how to relate these components of the enterprise architecture. Huxley and Stewart (2004) have proposed a means of linking and valuing this relationship in order to identify processes suitable for process redesign or re-engineering purposes.

Building on Huxley and Stewart (2004), a critical service prioritisation methodology is developed. This method uses as input, strategy documents, from which a text description for each strategy is rendered. The strategies are then rank ordered in a table. All weights representing contributions, problems and risks are tabulated in Excel, and the strategy-service map is rendered using Mind Maps. This paper is based on an extension to Service Identification through Process Prioritisation, to develop a robust and generic protocol of developing and articulating a service strategy map and producing specific as-is service strategy maps for Queensland Government agencies.

The first requirement is for a clearer understanding of the strategies of public service organizations. Existing classification scheme of organizational strategies have limited relevance to public agencies. They confuse strategy processes and strategy content, consist of simplistic taxonomies, and do not take sufficient account of the constraints faced by public agencies. Strategy content can be defined as the patterns of service provision that are selected and implemented by organisations. In comparison to the private sector the strategy need not be viewed as a *weapon* that is used to defeat rivals in competitive environment (Greer and Hoggett 1999). Rather,

strategy can be interpreted more broadly as a means to improve public services, whether these are provided by one agency or combination of various agencies (Boyne 2003). Strategy content is the outcome of strategy process (Boyne and Walker 2004). According to Rubin (1988), strategy content is a pattern of action through which organisations propose to achieve desired goals, modify present circumstances and realise latent opportunities. Strategy content can be conceptualised at two levels, one is at general level that describes the organisation's position and interaction with its environment. Second level is where an organisation seeks to maintain or improve its performance.

Limited literature on organisation strategies in public-service organisations has emerged since the early 1980s. Some of the notable contributors are Stevens and McGowan (1983) developed a typology of strategic responses to fiscal stress; Wechsler and Backoff (1987) provide four categories of strategy content developmental, transformational, protective and political; Rubin (1988) developed an "archetypal typology of strategic action"; Nutt and Backoff (1995) strategy classification is based on appropriateness in different organisational contexts; Charih (2000) provided a taxonomy of seven strategies based on Canadian Government department studies; most recently Boyne and Walker (2004) used strategic actions as a perspective to study strategy contents. These studies though provide useful insights about strategies in terms of stance and actions but they lack uniformity. Further the studies are scattered and there is a need to build up on the existing studies and provide a common understanding about orientations of strategies for organisations. This is more needed for strategies related to public organisations.

Identifying the existing gap in literature, three layers of strategies have been proposed using the published strategies of all government agencies. These layers are called kernel, cluster and individual. A kernel strategy is a strategy in common across all agencies. A cluster strategy is a strategy shared by a subset of agencies in such a way as to be thematically linked. An individual strategy is a strategy applicable in to only one agency.

Services support strategies. A kernel service is a service used by every agency. A cluster service is a service used by a sub-set of agencies, again thematically linked. An individual service is a service used by only one agency.

Services are high level elements found in the process reference model. A process reference model can be an artefact produced in the business architecture level 1 development of an enterprise architecture model. There are three levels of such reference processes: management, core and enabling. There are three types of process reference models: kernel process reference model depicting all the processes in common across all agencies; cluster process reference models depicting processes in use in specific clusters of agencies and individual process reference models, showing those unique processes found only in specific agencies.

As a first step to classify strategies, content analysis is carried out using strategic plans of the public agencies. These sources are useful starting point for building a picture of strategy content (Boyne and Walker 2004). The purpose was to understand how different public agencies behave, in contrast to strategies that are merely rhetorical or intended but unrealised.

METHODOLOGY

Content analysis is an observational research method that is used to systematically evaluate the symbolic content of all forms of recorded communications. These communications can be analysed at many levels such as image, word, roles, etc. and thus creating a realm of research opportunities (Kolbe and Burnett 1991). Content analysis can be defined as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson 1952; Krippendorff 1980; Weber 1990). A broader definition of content analysis according to Holsti (1969) is, "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (pp 14).

Content analysis can be a useful technique to discover and describe the focus of individual, group, institutional, or social attention (Weber 1990). It also allows inferences to be made which can then be corroborated using other methods of data collection (Stemler 2001). Content analysis is also useful for examining trends and patterns in documents. Stemler and Bebbell (1998) conducted a content analysis of school mission statements to make some inferences about what schools hold as their primary reasons for existence. This type of content analysis provides an empirical basis for monitoring shifts in public opinion. For example, the data collected from mission statements at one point of time can be objectively compared to data collected at some point in the future. This will help to determine if policy changes related to standards-based reform have manifested themselves in school mission statements (Stemler 2001).

The question can be raised to where content analysis can be more useful in understanding strategies related to public organisations. The essence of strategy is to match the distinctive competence or comparative advantage of the organisation with the developing opportunities in the environment, so as to serve existing goals, both implicit

and explicit (Bowman 1982). Following the development of a strategy for the organisation or of its departments it is necessary to work out a systematic implementation scheme which follows and supports the strategy. This scheme will involve programs, plans, organisation arrangements and budgets to serve the strategy (Boyne and Walker 2004; Charih 2000; Bowman 1982). While the content analysis of strategic plans may serve any of these aspects of an analytical structure, the two most probable advantages are environment and control (Bowman 1982). On environmental side content analysis provides a better understanding about competitors, suppliers and customers for organisations. It provides a way of catching broad trends in organisation context. Control is done through comparisons, e.g. performance to plan, plan to strategies etc.

Word-Frequency Count

One of the most common understandings about content analysis is that only doing a word-frequency count. This is based on the assumption that the words that are mentioned most often are the words that reflect the greatest concerns (Stemler 2001). The assumption may be true for some cases but also involve some counter-arguments to consider when using simple word-frequency counts to make inferences about matters of inferences. The word-frequency count analysis should consider that;

- Synonyms may be used for stylistic reasons throughout a document and thus may lead the researchers to underestimate the importance of a concept (Weber, 1990)

- Each word may not represent a category equally well

- Some words may have multiple meanings

Stemler (2001) suggests to use word-frequency counts to identify words of potential interest, and then to use a Key Word in Context (KWIC) search to test for the consistency of usage of words. Further, to impart validity to the analysis Leximancer text-mining software was used to analyse the content of collections of textual documents. In qualitative research, validation takes the form of triangulation. Triangulation lends credibility to the findings by incorporating multiple sources of data, methods, investigators, or theories (Erlandson et al. 1993).

Thematic Analysis

Leximancer is a software tool used to support lexical-text analysis, consistent with grounded theory methodology. The body of text is examined and a ranked list of terms is generated by an analysis of frequency of use and related occurrence. These terms then feed into a thesaurus builder, which creates a set of classifiers by iteratively extending terms through identifying more distant co-occurrence. This results in the formation of concepts that are related to portions of text, usually 2–3 sentences in length. Leximancer calculates the relative co-occurrence of concepts to generate a matrix which in turn is used to generate a visual display that illustrates the connectedness of concepts. Each concept is linked to the original reference text. This allows the user to revisit the analysis and impose specific limitations on the analysis, or seed the analysis with key terms or concepts. The advantage of using Leximancer, over hand coded descriptive or grounded theory analysis, is that large amounts of text can be subjected to analysis in a routine manner, using consistent methodology that generates a repeatable outcome. Multi-dimensional visualisation techniques facilitate understanding of the relationships between concepts, as well as the strength of those relationships (Zimitat 2006).

Previous statistical text analysis techniques such as Latent Semantic Analysis (LSA) and the Hyperspace Analog to Language (HAL) have demonstrated that highly useful and reliable information can be extracted from the word co-occurrence information in text. Leximancer extends and reworks this approach with two stages of non-linear machine learning to provide a statistical means of extracting semantic patterns from text.

Leximancer assists the analyst to discover new information from text, find patterns across datasets, and may assist in separating signals from noise. Using the Leximancer generated context maps and statistical outputs, analysts may be better positioned to efficiently gain insight and comprehension of large numbers of documents through the process of:

- Conducting semantic information retrieval of the key themes of records;

- Viewing bodies of data in a graphical format, and

- Navigating through the records whilst mining the text for deeper contextual associations (Smith and Humphreys 2005; Smith 2003; Smith 2000)

CASE STUDY DESCRIPTION

There are three levels of government in Australia - local, state and federal. Each level of government is responsible for making decisions and providing services to the people to whom it is responsible.

In Australia, the three levels of government work together to ensure that all Australians are able to live, work and participate fully in our community. The Federal Government is responsible for taxation and economic matters, and the larger issues such as national security, communications and welfare. As well as providing services and collecting taxes the Federal Government provides funding to both state and local government to pay for services to taxpayers.

The Queensland State Government, using both Federal money and money raised from its own taxes and activities, provides services such as hospitals, schools and policing. The Queensland Government is made up of departments and a number of government bodies. Following the 2009 Queensland general election, the Premier announced the creation of 13 new departments to help streamline Queensland Government information and services.

Our study focuses on the departments of Queensland State Government. For the purpose of this study the departments are further divided based on the focus of their service delivery areas. The strategic plan document collected helps in identifying further the divisions in individual department.

DATA ANALYSIS

Documents related to strategic plans are downloaded from respective department's website. In order to prioritize the strategies based on the evaluation of individual department, annual reports and budget documents are also downloaded from their websites. Overall, we had around 60 different documents containing information about strategies, budget, employee strength, etc. for individual departments. We focused on collecting current documents in order to have a real-time understanding about strategies and priorities of individual departments as well as of Queensland government.

Lexical analysis was undertaken using Leximancer ver. 3.0 (www.Leximancer.com). The default settings were used for analysis. The concept dictionary arising from the analyses was edited using the following processes: words and their plural forms were combined, words with their related tenses were combined, and identical words in capitalised and non-capitalised forms were combined. Abbreviations were combined with their long hand term, and special terms such as www, edu and au were deleted from the list of concepts.

Word-Frequency Count

Wordle is a means for generating word clouds from the text provided. The clouds give greater prominence to words that appear more frequently in the source text. The clouds can be managed with different fonts, layouts, and colour schemes (www.wordle.net).

The text related to strategy of individual departments is provided as an input to Wordle and then word clouds and word-frequency counts are extracted. This process is repeated for all the 20 departments. The most frequently used words and the respective departments which used them in their strategies are plotted using a Radar diagram (refer Table 1).

To generate word cloud for consolidated Queensland government strategies, strategies of all departments are provided as a single text as an input to Wordle. Word-frequency count is also extracted. Based on word-frequency count a pie-chart representing top 10 words and their percentage usage is shown in Figure 1.
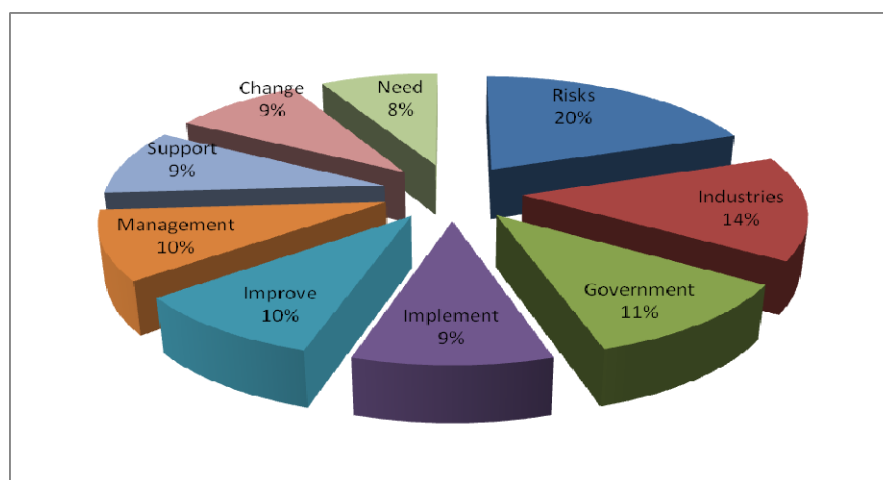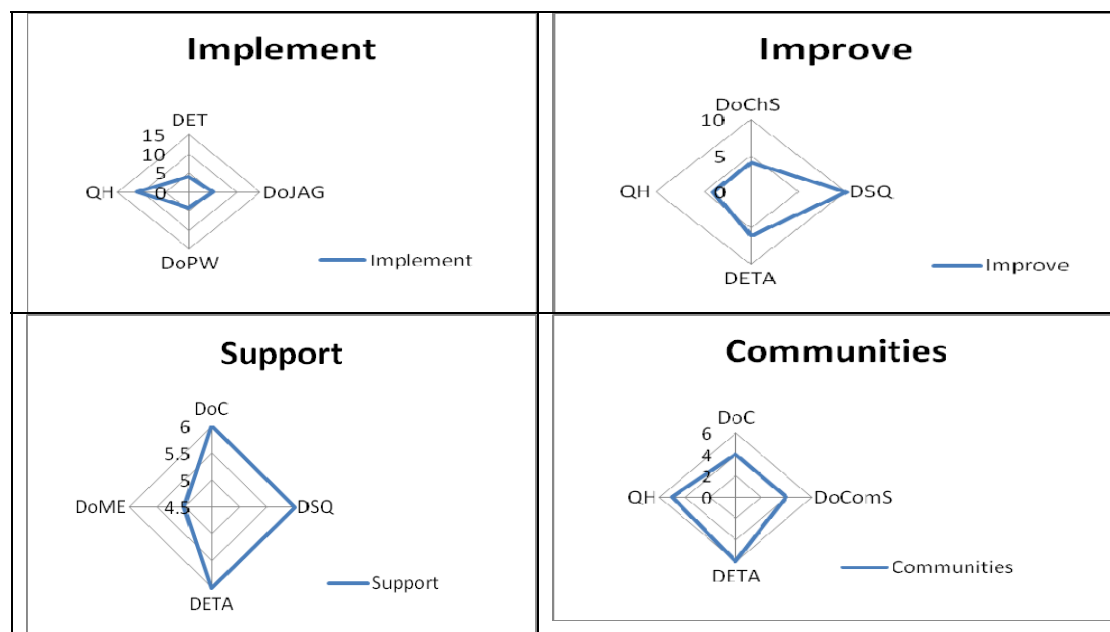

Figure 1: Percentage usage of top ten words in consolidated government strategies

5th Conference on Qualitative Research in IT   Strategy Content Analysis: A Case Study on Government Agencies
29-30 Nov 2010, Brisbane   Stewart and
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Table 1. Radar charts for most frequently used word in strategies from Wordle analysis

Leximancer Analysis

Similar to Wordle analysis, we provided text of strategies of individual departments as an input to Leximancer. The software then generated conceptual maps, list of concepts and themes, as well as reports mentioning categorization of various concepts. We have to exclude analysis of strategies for Department of Police Services as Leximancer was unable to generate meaningful concepts and themes because of limited textual content. Words such as service/services, Queensland, Government are excluded from the analysis of concepts as these keywords are expected in the strategies and their inclusion will not assist in meaningful analysis.

The analysis on Leximancer is done in two phases. First phase, the objective was to get the relevant concepts and themes for strategies of individual departments as well as for Whole-of-Government based on raw data. In second phase of analysis our focus was to refine the text, identify major concepts and themes, and segregate strategies based on newly identified themes and concepts. Refinement of text was done in following manner:

- Removing redundant labels such as Queensland, Government, Service/Services

- Removing capitals of each sentence

- Ensuring only proper nouns were capitalized

- Sorted alphabetically to remove department bias

In this phase of our analysis preference was given to relevance of identified concepts and themes in place of their counts. Similar to phase one analysis, some of the concepts and themes are same, for example, improve, support and develop.

Concepts

Webster Dictionary describe concept in different ways. For our research the most adequate definition of concept is "an abstract or generic idea generalized from particular instances ". Concepts in Leximancer are collections of words that generally travel together throughout the text. The software generates information about concepts in two ways; count and relevance. Concepts are differentiated based on two categories; name-like and word-like. These are wildcards which match all the word-based and name-based concepts respectively. In our analysis, we have combined both name-like and word-like concepts as both generated similar concepts.

1. Count

Figure 2 represents the concepts in the order of their count as extracted from the software. These are the most frequent concepts identified from the strategies of individual departments. As can be seen, *improve* is the most frequently used concept followed by management, implement, risk, support, industry, etc. In comparison, for consolidated Queensland government strategies *ensure* is the highly cited concept followed by improve, risk, support, development, etc (refer Figure 3).
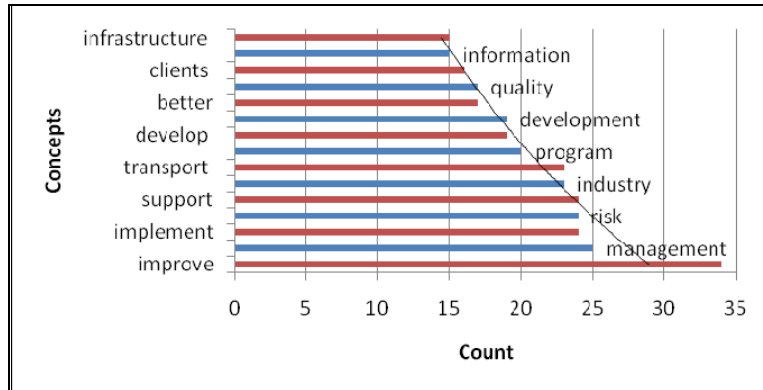

Figure 2: Bar chart of concepts based on count
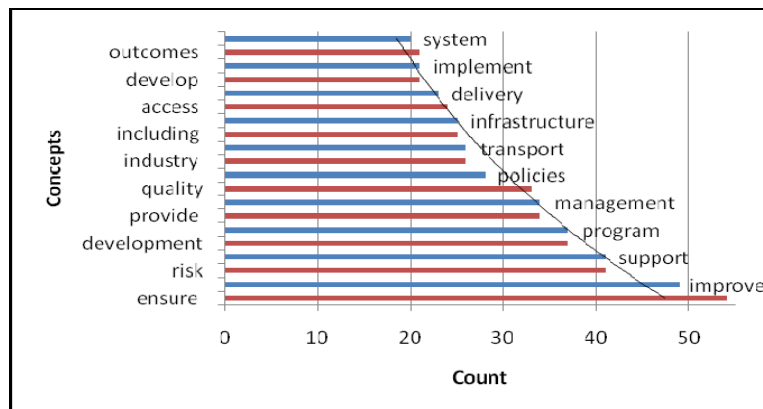
Figure 3: Bar chart of concepts based on count: Whole-of-Government strategies

2. Relevance

First phase analysis based on relevance, reveals that *development* is most relevant concept followed by improve, support, industry, management etc. For consolidated Queensland government strategies, *ensure* is most relevant concept. The remaining include, improve, implement, risk, support, development, etc.

In the analysis of concepts we merged forms such as deliver and delivery, implement and implementation. All the concepts have a relevance score of more than one which means that they were common across strategic plans of more than one department. Improve as a concept has got prominence in 6 out of 20 departments and is most relevant for 4 (DoChs; DSQ; DETA; DoJAG) out of the 6 departments' strategic plan. In comparison support has also got highlighted in 6 departments but is prominent (Relevance 100%) in only one department's strategic plan. The concept of develop/development is common for strategic plan of 9 departments but its relevance is varied (Relevance: 29% - 100%) across the departments.

In the analysis of consolidated government strategies, development/develop, improve and provide emerged as prominent concepts. Given consolidated government strategies involved the combined text of all 20 departments, develop/development emerging as the most important concept is not surprising. Since develop/development is mentioned in strategic plan of 9 departments and also we merged develop and development into single concept development during Leximancer analysis. Overall, develop/development, improve, support and provide can be considered as most important concepts and can form the basis of identifying kernel strategies.

So, concept analysis based on count and relevance presents useful insights. The concepts which are frequently used in the strategies of individual departments do not necessary means they are equally relevant. For example, improve and management are the two frequently used concepts count-wise but they are not the most relevant.

Development becomes more relevant followed by improve. In case of consolidated strategies of Queensland government though, ensure and improve emerge as most frequently used and most relevant concepts. There is one more interesting observation; improve emerge as most frequently used concept in strategies among individual departments, whereas ensure becomes most frequently used concept when the strategies are combined to analyse consolidated Queensland government strategies. Similar, phenomenon is observed while comparing the relevance in the two scenarios.

Themes

Similar to concepts, theme has also defined in different ways by Webster Dictionary. We feel most appropriate definition of theme from our perspective is "a subject or topic of discourse or of artistic representation or a specific and distinctive quality, characteristic, or concern."

The first phase analysis based on the strategy text provided different themes related to individual departments and also for consolidated government strategies. Due to space constraint it is not possible to provide thematic map for individual departments generated from Leximancer. We analysed the major themes emerging from the software for individual departments. These themes are support (30 %), followed by development, management, ensure, improve and risk. The major themes emerging from analysis of strategies of individual departments show similarities with the themes of consolidated Queensland government strategies. Thus, it can be concluded that there is congruence between the themes of strategies for individual departments with overall government strategies but same cannot be said about the concepts.

The second phase analysis of text for individual department, presents improve, support and provide as important themes. Unlike concepts, these themes are not common across many departments. Support is the most common theme across 6 departments followed by improve, common across 4 departments. The analysis of consolidated government strategies highlights themes which are very different from those emerging from strategic plans of individual departments.

Leximancer generates theme maps and also provides the flexibility to vary the theme size. Theme size can be varied from 0% to 100%. Percentage variation in theme size shows the variation in relevance for the theme. For example, the theme(s) highlighted in 100% theme size are the most relevant for the text entered. In our analysis, we focused on two theme sizes 50% and 100%.

Figure 4 shows the comparative chart of themes using theme sizes 100 and 50 percent. We can see that there is variation in relevance of themes according to theme size. Their order of preference also changes according to theme size. Improve, support and assist are most relevant when theme size is 100% but support becomes third preferred theme succeeded by develop when theme size is 50%. Further, when theme size is 100%, it becomes clear commonality of themes across departments also reduces. Thus it can be inferred that a theme is more specific to particular department rather than being common across departments. In other way the themes emerging from strategic plans of departments are individualistic rather than being cumulative.
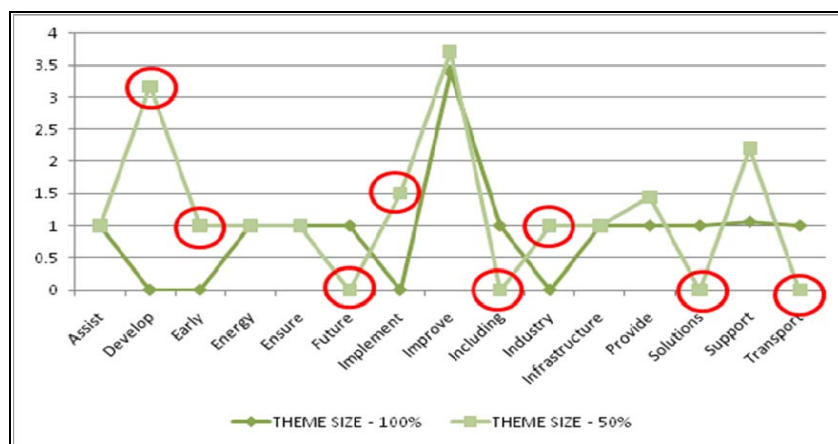

Figure 4: Comparison of themes based on theme size

Leximancer also generates spatial maps; topical network map or social network map. The map presents the main themes and associated concepts identified from the text input. In our case we focused on topical network map. The topical network map illustrates three important characteristics of the text. First, the frequency of concept in the document collection is related to the boldness of the text – the bolder or brighter the concept, the more it appears in the text. Topical network maps were generated for strategy text both in first and second phase of

analysis. In second phase we focused more on theme size, which represents the relative relevance for concepts and themes. Themes size 100% shows themes which are most relevant for individual departments or for whole-of-government. For consolidated government strategies *ensure* emerged as most relevant theme when theme size was 50 %. *Development* is the single most relevant theme when theme size is 100%.

The coloured circles with names surround local clusters of concepts. These are called themes and form around highly connected concepts which are parents of thematic clusters. Though not essential, the colour of the theme gives an indication of the connectedness of its parent concept.

FINDINGS

In second phase we modified the text and using Leximancer analysed the strategies to refine emerging concepts and themes emerged from Phase 1. Table 2 presents the variation in emerged concepts and themes (presented in their order of relevance) from the analyses in Phase 1 and 2.

From the table it can be observed there are similarities in concepts and themes emerging from both phases of analysis, though there order of relevance is changed. Leximancer as a tool cannot be used for sophisticated analysis but provides useful initial understanding for further analysis. The analysis so far has provided us a snapshot of the concepts and themes of the strategies.

Table 2. Concepts and themes: Phase 1 and Phase 2

PHASE 1	
Concepts	Develop, Improve, Support
	Ensure, Improve, Implement*
Themes	Support, Development, Management
PHASE 2	
Concepts	Improve, Support, Develop
	Develop, Improve, Provide*
Themes	Improve, Support, Provide
	Industry, Ensure, Development*
	Ensure, Provide, Development* ----- {Theme Size 50%}
	Development* ----- {Theme Size 100%}
*Consolidated government strategies	

Strategy Classification

The next step will be to classify the strategies. Based on themes identified, we classify strategies as follows:

- Kernel strategies include themes – Improve and Support (Aggregate relevance $\geq 2.5 - 3.5$)

- Cluster strategies include themes – Provide, Implement and Develop (Aggregate relevance < 2.5 and $\geq$ 1.5)

- Individual strategies include themes – Including, Ensure, Infrastructure and Clients (Aggregate relevance <1.5)

These themes are kept uniform while classifying strategies for the three mentioned departments.

Kernel Strategies:

Examples of kernel strategies are: improve access to services; support growth; support programs; support development; adapt and refine business models to better meet government priorities; adopt a collaborative approach to policy development, planning and performance across the department's service areas;

Cluster Strategies:

An example of a cluster strategy is to provide financial assistance. This was found in the Department of Housing and Department of Communities. A finer grained analysis is required to detect further cluster strategies.

Individual Strategies:

Examples of individual strategies are given for Department of Education, Training and the Arts; Department of Health and Department of Transport.

a) Department of Education and Training:

e.g.: Achieve greater integration of infrastructure and service delivery planning responsive to community needs; Work with the sector to attract and retain a diverse and highly skilled early childhood workforce, including qualified early childhood teachers; • Review and improve regulatory practice and systems to ensure quality outcomes and stakeholder confidence in the training and higher education systems.

b) Queensland Health:

e.g.: Ensure all healthcare professionals working in Queensland Health facilities are appropriately registered; Recruit additional medical, nursing and allied health staff including delivering additional Nurse Practitioner and Rural Generalist positions; Maintain infrastructure and assets through developing maintenance and life cycle replacement funding models.

c) Department of Transport and Main Road:

e.g.: The three levels of government and the private sector will collaborate to provide transport infrastructure and services; All initial planning for major government infrastructure will include planning for transport.

CONCLUSION

In this paper we provided a classification of the strategy content of public service agencies. This was achieved by using analysing text of strategic plans of agencies using Leximancer. Our approach also able to address two problems in literature: the failure to recognize the distinctive characteristics of public service organizations and weaknesses in the classifications of public-sector agencies. The uniqueness of our approach is the classification of strategies based on identified concepts and themes, which is different from the existing literature which classified based on strategic action and strategic stance. The strategy classification scheme based on content analysis that we have developed can be used as the basis for a stream of empirical research on public service organizations. In particular, two major questions arise. First, does the classification scheme capture the variety of strategy content in public agencies? An answer to this question will require the findings to be supplemented by views of managers at various levels about strategy in practice. Further, valid measurement of strategy content will require hard evidence on actual changes in markets, services, revenues, and external and internal structure. Second, how can the pattern of strategy content be explained? Explanations of inter-organisational differences in strategy content will emerge from subsequent theoretical and empirical work in this area.

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ACKNOWLEDGEMENTS

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