A Strategy for the Implementation of Standard Data Structures in Financial Management Information Systems – A South African Case Study

Silma KOEKEMOER

[0000-0002-9963-1974]
Nelson Mandela University, School of IT,
PO Box 77000 NMU, Port Elizabeth, 6031,
South Africa
Email: silma.m.koekemoer@gmail.com

&

Rossouw VON SOLMS

[0000-0002-9860-2346]
Nelson Mandela University, School of IT,
PO Box 77000 NMU, Port Elizabeth, 6031,
South Africa
Tel: +27 41 504 2604,
Email: rossouw@mandela.ac.za

Abstract

Strategy denotes the plans an organisation makes to achieve a set of goals or objectives. An information technology (IT) strategy represents one pillar of a strategy triangle, consisting of a business, organisational and IT strategy, and depends on the perspective, either in support of the business strategy as a master plan for the IT function, or based on the role of IT within the organisation. This paper focused on a strategy for the implementation of

standard data structures in financial management information systems. The research employed a pragmatic philosophy resulting in a practical solution to remedy a real problem. It used the design science methodology and principles of case study and action research. The data were collected from 25 municipalities over a three-year period (2014-2016) and culminated in a suitably generic implementation strategy to be used broadly for this and similar IT projects. The research was limited to municipalities in South Africa only, but the resultant strategy should be useable across the borders and into other business sectors.

Keywords: *Information Technology; Strategy; IT Governance; IT Implementation; IT Project Management*

1.Introduction

Strategy refers to plans an organisation formulates in order to achieve a particular purpose over a period of time (Hornby, 2010). Chen et al. (2010) add that, for the purposes of IT, the perspective informs the strategy by supporting the overarching business strategy, as a master plan to manage the IT function, or based on the role of IT within the organisation. The perspective informing the strategy that is being discussed in this research paper, however, is the implementation of a uniform data structure in disparate municipal financial management information systems.

Research by the Standish Group (Ulrich & Newcomb, 2010) found that IT projects are completed late, up to 72% of the time, and only 35% of these are considered successful. A further 46% overrun the budget, or deliver reduced functionality. Shark (2009) avers that "the skills and success factors in project delivery are always based on the right people, with the right processes, utilising the right tools", and that these are not always present when implementing IT projects. Posthumus and Von Solms (2010) confirm the need for implementation guidelines: "There is a need for clear guidance on IT governance and its implementation based on the current lack of broad level understanding of strategic IT-related issues". The Auditor-General (2017), speaking at a national workshop in Cape Town, provided feedback on a pre-implementation review and the prevailing position of IT in municipalities, and the general readiness to implement the standard data structures. The report highlighted the fact that municipalities do not have adequate controls, comprehensive

implementation plans, sufficient competent staff and/or clearly documented business processes to enable smooth implementation, as is required for this project.

Thus, a strategy for the implementation of standard data structures in disparate financial management information systems would contribute towards addressing the identified shortcomings and improve the success rate of this and similar projects.

This paper provides the problem statement and objectives of the research, the theoretical foundation for the IT strategy, and the methodology that was employed. It continues with a discussion of the strategy development process, strategy implementation, evaluation and control. The implications of this research for theory and practice, recommendations and conclusions, wrap up the paper.

2.Problem and Objectives

Municipalities across South Africa are required to implement a standard data structure in their financial management information systems (South Africa, 2014), also referred to as the Standard Chart of Accounts for Municipalities (mSCOA). To comply with this regulation, municipalities must upgrade or re-implement their existing financial management information system, or implement a new system. As indicated above, implementation projects of this nature are delayed, overrun their delivery time and budget, and can be further negatively impacted by a skills shortage in municipalities. Therefore, the primary objective of this research paper is to present a high-level strategy to guide the implementation of standard data structures in financial management information systems.

Although the research was conducted in a municipal environment, the proposed strategy can be deemed suitably generic to apply to cross-border municipalities and any business sector implementing a similar project.

3.Theoretical Foundation of the IT Strategy

Strategy development requires a clear understanding of the notion and aims of the strategy, mastery of the tools and techniques of the discipline, a structured methodology, and diligent management in the execution thereof (Boar, 2001). Chen, Mocker, Preston and Teubner (2010),

Galliers and Sutherland (1991), Grant (1991), Levy, Powell and Galliers (1999), Mintzberg (1987), Salmela and Spil (2002), Gcaza and Von Solms (2017), Tsokota (2016), and Rumelt (2011) were consulted to gain an insight into the strategy design and evaluation process for this study. Future research could consider other theories, such as technology determinism and voluntarism theories, and technology instrumentalism, for this purpose.

Boar (2001) maintains that business is all about competition and advantage. Thus, business strategy represents the eternal struggle of businesses to gain advantage – a valuable asset in any business. Grant (1991) agrees that strategy embodies the match an organisation makes between the internal resources and skills, and the opportunities and risk created by the external environment. Taking the abovementioned into account, Glueck (1972) defines strategy as "a unified comprehensive and integrated plan relating the strategic advantages of the firm or enterprise to the challenges of the environment. It is designed to ensure that basic objectives are achieved". Fred (2016) and Gartner (1997) refer back to the military, mentioning bridging gaps between policy and tactics, and ends and means.

Information is a strategic resource of any organisation and, therefore, its availability impacts the development and formulation of organisational strategy. Decision makers at every level of the organisation should define their requirement for information with this guiding a top-down and bottom-up approach to information strategy (Tansey, 2010). IT strategy, on the other hand, is formulated from three different perspectives: in support of the business strategy, as a master plan for the IT function, and based on the role of IT within the organisation (Chen et al., 2010). Chen et al. (2010) found that the term IT strategy is widely used but not well defined nor understood. Similarly, strategies for the implementation of IT and/or the components of such an implementation have not been documented in detail.

Rumelt (2011) avers that strategy originates from a diagnosis, which consists of an assessment to identify the overall nature of the challenge that needs to be addressed, the goals to be met and the available resources. Guiding policies (GP) set the overall approach and direction towards addressing the diagnostics (D), while coherent actions (CA) provide coordinated steps to execute the guiding policies. These steps represent the plausible and feasible immediate actions to be taken towards achieving the final goal.

The research followed a strategy development approach based on the kernel concept originally coined by Rumelt (2011) and refined by Gcaza and Von Solms (2017). The researcher, however, further developed and refined this approach to strategy development, which is illustrated herewith in Figure 1:
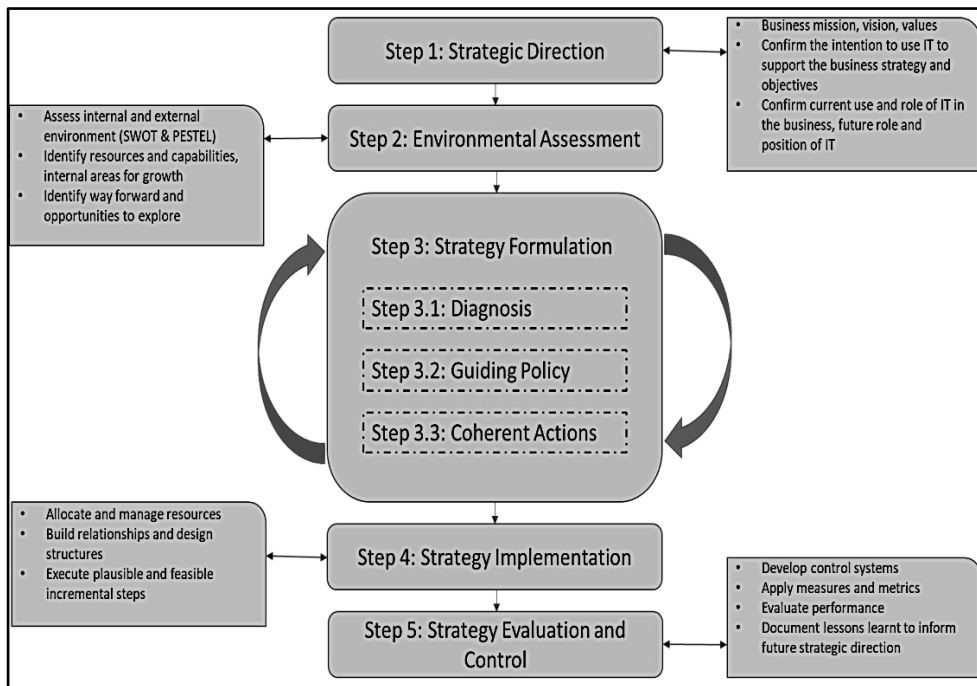

Figure 1: Strategy formulation methodology (Researcher)

4. Methodology

The research design and methodology have important implications for the way in which the research is conducted, as it forms the foundation that determines both the research process and the research method chosen to implement the research strategy (Saunders, et al., 2009). Research elements based on case study and action research principles were used to develop the implementation strategy.

The population for this study comprised all the 257 municipalities in South Africa. The municipalities are divided into categories, with eight metropolitan municipalities in category A, 205 local municipalities in

category B, and 44 district municipalities in category C (South Africa, 1996).

The sample, consisting of 25 sampling units or 10% of the population, was drawn from all three categories of municipalities and represented a geographic distribution (at least one municipality in each of the nine provinces). It should be noted that this sample was not determined or influenced by the researcher but was merely adopted (accidental sampling) from the national project, implementing standard data structures in financial management information systems.

The data gathering was conducted in these 25 municipalities over a period of three years, as they were engaged in pilot implementations of the newly regulated standard data structure (mSCOA) (South Africa, 2014). Data collection activities consisted of six on-site assessments at each of the participating municipalities, involving the project implementation teams from the municipality and National Treasury. The audit findings per municipality, for the same period, were included in the data gathering (Auditor General, 2018).

The data was subjected to a thematic analysis and reduced to a set of findings, which informed the strategy development.

5. Development of the Strategy

This section discusses the process that was followed to develop the implementation strategy, and is based on the methodology depicted in Figure 1 above. The strategy development process was based on the kernel concept originally coined by Rumelt (2011) and refined by Gcaza and Von Solms (2017). The researcher, however, further developed and refined this approach to strategy development for application in this research. The five-step development process includes strategic direction, an environmental assessment, strategy formulation, strategy implementation, and strategy evaluation and control. The third step, strategy formulation, is further sub-divided into three steps: diagnosis, guiding policies and coherent actions.

5.1 Strategic Direction

Municipalities operate in a highly regulated and legislated environment. The strategic direction of the municipality, which is mainly aimed at basic service delivery, is guided by an Integrated Development Plan (IDP)

(South Africa, 2000). The IDP is linked to national, provincial and local priorities, and the approved budget of the municipality. Organisational performance is also measured and reported accordingly.

5.2 Environmental Assessment

Environmental assessment tools, such as a SWOT analysis, cover key areas on which to focus when identifying business imperatives, and developing a vision and mission for the organisation. However, for this environmental assessment, specific focus was placed on the availability and quality of resources, and the unfolding of 25 pilot municipal IT implementation projects. The participating municipalities were repeatedly assessed over a three-year period, and data collection was supplemented and confirmed with reports of the Auditor General, provincial treasuries and IT system vendors. The data was analysed using thematic analysis and resulted in a set of findings.

It became clear from the data gathering, analysis and findings that municipalities were not following an implementation strategy, employing a specific project management methodology, or have assigned roles and responsibilities as these relate to the implementation projects.

5.3 Diagnosis

A set of diagnostics were formulated from the environmental assessment above, as per Step 3.1 in Figure 1 above. These diagnostics are:

Diagnosis 1: Insufficient research, planning and preparation before project implementation.

Diagnosis 2: Inadequate governance, project oversight and project management.

Diagnosis 3: Hardware, software and data related deficiencies.

Diagnosis 4: Dependence on external resources to deliver key projects and services.

Diagnosis 5: Complex municipal environment with undefined/ non-aligned business processes.

Diagnosis 6: People related issues including a lack of critical skills, non-participation and insufficient change management.

Diagnosis 7: Other issues emanating from limited resources including funds and time; and deficient project management skills.

The proposed implementation strategy, based on the seven diagnostics, is represented in Figure 2 herewith:
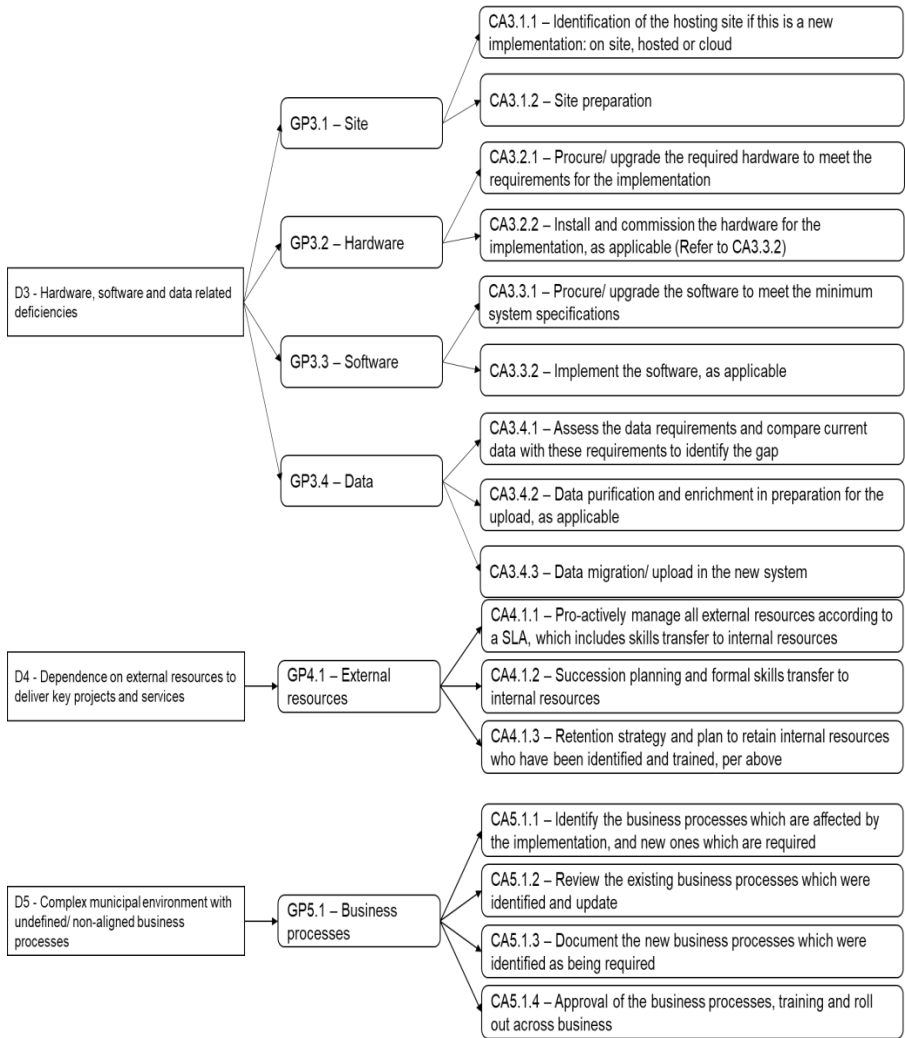
Figure 2: An implementation strategy for standard data structures in financial management information systems (Researcher)

Although the complete strategy was developed by addressing each of these seven diagnostics, only one of the diagnostics—Diagnostics 2—will be discussed for the purposes of this paper.

"Inadequate governance, project oversight and project management" are used for further discussion in this paper. It is clear that effective project governance and oversight, together with efficient project management, ensure that projects are delivered smoothly within the allocated time and budget. Data collected clearly indicated an absence of governance, oversight and effective project management in general, a finding confirmed in the 2018 Consolidated Annual Audit Report (Auditor General, 2018). Koekemoer and Von Solms (2017) also

reported a low level of project management maturity across municipalities, a diagnosis that can be remedied through guiding policies. This diagnosis will be further disseminated in the rest of this section to explain the strategy formulation process.

5.4 Guiding policy

Rumelt (2011) explains that the guiding policies, Step 3.2 in Figure 1, determine the overall approach to address the broad challenges which were identified through each diagnosis, while the coherent actions, Step 3.3 in Figure 1, result in coordinated steps towards delivering the solution and addressing the initial problem statement. Thus, the guiding policies are designed to remedy the diagnostics, provide direction and incorporate governance principles into the delivery of IT projects. In the case of D2, two guiding policies were formulated, namely:

Guiding Policy 2.1: Governance and oversight; and
Guiding Policy 2.2: Project management.

GP2.1 Governance and oversight: IT governance, a management responsibility, encompasses IT controls functioning effectively as designed, and ongoing IT practices being reviewed and regularly reported on. This notion is supported by Juiz et al. (2014), who state that effective IT governance, risk management and oversight create trust and confidence in the use of IT.

In the case of municipalities, the municipal council is responsible for IT governance and therefore the mSCOA regulation also mentions the council as being responsible for ensuring compliance (South Africa, 2014).

GP2.2 Project management: IT project management maturity levels have been found to be low across municipalities (Koekemoer & Von Solms, 2017). This diagnosis (D2) clearly has a negative impact on the IT implementation described by Ducharme Consulting (2017) as complex, requiring sufficient research and planning, as well as governance and management oversight.

Coherent actions are required as immediate steps towards achieving the stated guiding policies in remediation of the diagnosis. Similarly, for each of the seven diagnosis, one or more guiding policies were formulated.

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5.5 Coherent Actions

Rumelt (2011) and Tsokota (2016) are in agreement that a strategy without action steps which are plausible and achievable, is worth nothing and has no practical value. This notion is supported by Boar (2001) who maintains that execution is the most difficult step of the entire strategy. Boar (2001) goes on to state that "strategy execution is won or lost based on the depth, insight, and foresight of the strategy plan", the coherent actions in this case.

Coherent actions are developed from the guiding policies, as per Step 3.3 of the strategy development model in Figure 1. These are guided by best practice, regulations, legislation and the literature review, and should contribute towards addressing the objective of the strategy, which is to guide the implementation of standard data structures in financial management information systems. The proposed coherent actions (CA) to address GP2.1, governance and oversight, therefore are:

CA2.1.1 – IT projects should support the strategic objectives and service delivery priorities of the municipalities. Therefore, council and management should ensure that these projects contribute towards the goals and objectives of the municipality (Myburgh & De Costa, 2017);

CA2.1.2 – Executive support and oversight, together with business involvement, is required. These emanate from formal structures which are aimed at achieving broad involvement and participation (PWC Southern Africa, 2016);

CA2.1.3 – IT procurement should be based on a business case in order to achieve cost benefits, and should follow the approved procurement policies of the municipality. Executives should oversee the procurement process without getting involved or influencing the outcome, and monitor the achievement of the intended benefits of the project.

CA2.1.4 – Independent assurance review and audit reports provide executives with an independent confirmation that governance is adhered to and supports their oversight role (PWC Southern Africa, 2016).

These four coherent actions, flowing from GP2.1, provide immediately actionable steps to address IT governance in the municipality, manage the inherent risk associated with IT implementation projects, and improve oversight and reporting.

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GP2.2 refers to low levels of project management maturity and therefore, the proposed coherent actions intend to address this situation towards providing a remedy for D2.

CA2.2.1 -Implementation projects should follow a formal project management methodology, which would assist municipalities with managing these projects, monitoring and reporting on the progress, as well as improving the governance thereof.

CA2.2.2 -Municipalities require adequate resources to execute the project plan. The Auditor General (2015) has however, consistently reported insufficient municipal resources as one of the main reasons for service delivery challenges and failed project implementations.

CA2.2.3 -Formal project management methodologies include regular reporting covering progress, stage gates, risks, issues and key decisions. The data collection, assessment cycles and regular visits to municipalities enforced reporting and positively influenced the roll out of the respective implementation projects, Salmela and Spil (2002). This practice should be a standard for all IT implementation projects.

CA2.2.4 -IT projects were found not to be formally closed off, IT assets not capitalised, completed IT projects not reviewed, and lessons learnt seldom captured. Completed projects should be handed over to maintenance teams for support, and the assets capitalised. A close out report should be prepared and submitted to the executive.

Again, each of the guiding policies related to the other diagnosis has one or more coherent steps, which were formulated to successfully implement each of the guiding policies.

The discussion above unpacks Diagnosis 2, "inadequate governance, project oversight and project management", by providing guiding policies to remedy the diagnosis, and coherent actions to immediately implement the policies. Similarly, each one of the seven diagnosis from the implementation strategy, in Figure 2 above, have been remedied with proposed guiding policies and coherent actions towards their implementation.

Despite the fact that the strategy was developed from data collected at municipalities, it can be argued that it is sufficiently generic to be

applicable in any environment for the implementation of standard data structures, financial IT systems, or any similar projects.

6. Strategy implementation

According to Rumelt (2011), strategy represents a set of actions intended to create business advantage, is based on position or perspective, and derives value from being implemented and evaluated, as represented in Steps 4 and 5 in Figure 1. However, implementation requires people equipped to deliver the task and a programme or plan to guide the execution (Shark, 2009).

In the case of this research project, the standard data structure was being implemented by 25 pilot municipalities over a three-year period and the culminating artefact, an implementation strategy for this purpose, was developed from the findings gathered from these implementations. It was therefore not necessary to implement the strategy again to prove the concept.

6.1 *Government*

The government, through the State Information Technology Agency (SITA), formulates and regulates the deployment of IT across government. This is strengthened by legislation (South Africa, 2013), regulations (South Africa, 2014), and guiding frameworks (Department of Public Services Administration, 2014). While legislation and regulations are mandatory, frameworks and strategies are at the discretion of the implementing institution. Thus, the government should consider assessing the implementation and use thereof, or enforce implementation through regulation to ensure that these are adhered to. Appointing a team of consultants or auditors for this purpose would strengthen the capacity of government to ensure that institutions benefit from the available guidance.

6.2 *Service Providers*

It became apparent from the research that service providers, IT vendors and consultants hugely contributed to the success of this project and, in many cases, support municipal operations beyond their contractual obligations. The Auditor General, as well as the National Treasury, have

noticed this trend and issued circulars to contain the cost related to this practice (National Treasury, 2016). The proposed implementation strategy will address this by guiding municipalities on managing IT implementations in such a way that the dependence on service providers, and the cost thereof, is reduced.

7. Strategy Evaluation and Control

Strategy evaluation and control, Step 5 in Figure 1, require an actual implementation of the strategy, with metrics for measuring each of the guiding policies and coherent actions, and success indicators to evaluate the result of the implementation.

In this case, the national and provincial treasuries evaluated and controlled the pilot implementation projects through regular visits to individual municipalities, and evaluations of the progress being made. This continued and has been expanded to include all municipalities. In addition, all municipalities are required to submit regular reports, in the form of data string submissions, to the Local Government Database and Reporting System, which is hosted by the National Treasury. These data string submissions are scrutinised to ensure that all municipalities are complying with the regulation (South Africa, 2014), and that the data classification structure is being adhered to.

8. Implications for theory and practice

The research contributed by providing an implementation strategy for IT projects, and this contribution is of a generic nature so that it can be broadly applied to municipalities across the borders, as well as other business sectors. It also provided an understanding of the municipal IT environment and the role which legislation, regulations and frameworks play in government institutions.

Furthermore, the research involved all three spheres of government, IT system vendors and consultants, and the Auditor-General, bringing together multiple stakeholders with a direct interest in the financial health of municipalities.

The research employed case study and action research principles, with data gathering extending over a three-year period. This close involvement with the research subjects contributed pertinent insights to the researched phenomenon.

9.Recommendations and Conclusions

The research project found that municipalities were experiencing inadequate governance, limited project oversight and low levels of project management maturity, which were negatively impacting their ability to implement standard data structures in their financial management systems, as was required by the mSCOA regulation. The research project culminated in a high-level strategy that is based on governance principles, to guide the implementation of standard data structures in financial management information systems, and therefore has met the set research objective.

A limitation of this research is the fact that data collection only included municipalities in South Africa. Thus, it is recommended that future studies be expanded to include municipalities outside of the country and organisations from other business sectors.

The paper has provided a strategy for the implementation of standard data structures in financial management information systems that is sufficiently generic to be used for similar IT implementations and business sectors.

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