Comparative application of a business process maturity model in the public sector

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ABSTRACT

Business process management is central to organisational capability and organisations need to build, maintain, and continuously improve their organisational capability. Central to this is the ability to accurately assess organisational capability. A common mechanism for this is through the use of a maturity model. This paper describes the application of a business process maturity model in the APS. It outlines the application of the maturity model approach as a comparative assessment in a real world setting. The paper discusses the broader application of maturity models, comments on some of the limitations of maturity models and challenges the notion that business process maturity is a function of simple growth in capability.

Keywords: maturity model, change management, business process management

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Organisational capability covers a broad range of concepts relating to the ability of organisations to achieve outcomes. Poorly developed organisational capability in the public sector can have significant negative impact on achieving outcomes for both government and citizens. In the Australian Public Service (APS), organisational capability has been defined as the combination of people, processes, systems, structures and culture that contributes to continuously improving performance as a whole and by its individual departments and agencies[1] (Australian Public Service Commission, 2007, p. 10).

Business process management is central to maintaining organisational capability in the APS. In this context, business processes can include administrative systems such as information, communications and financial systems, but also extend to governance arrangements, risk management, managing change and project management. Consequently, the APS is required to build, maintain and continuously improve its organisational capability through effective and efficient business process management. However, assessing organisational capability across an institution as large, diverse and devolved as the APS presents considerable methodological and practical challenges.

Since 2010, the APS has implemented two interdependent methods to assess organisational capability. The principal method is the capability review program that was introduced in *Ahead of the Game: Blueprint for the Reform of Australian Government Administration* (Advisory Group on Reform of Australian Government Administration, 2010). A capability review is a forward-looking review that assesses an agency's ability to meet future objectives and challenges. The focus of these reviews is leadership, strategic and delivery capabilities (Australian Public Service Commission, 2012). The

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[1] In this paper the term 'agency' is used generically to refer to the individual entities that comprise the APS. More information on the agencies that comprise the APS and the way they are categorised can be found at: http://www.apsc.gov.au/publications-and-media/current-publications/australian-public-service-agencies.

second, and complementary method, involves all APS agencies using a standard maturity model to assess key organisational capabilities.

Maturity models are widely used in evaluating business processes in organisations. There are many commercial products available that are focused on information technology and project management, but their application has also broadened into assessing other business process functions such as human capital management. In the APS, organisational capabilities are placed into a standard maturity model structure consisting of five maturity levels ranging from ad hoc (immature) to optimised (mature). Appendix 1 is a typical the five-level maturity model used in the APS.

The levels of the maturity models are explicitly hierarchical. This illustrates a central theme of all maturity models; namely, that enhancing organisational capability is a process of continuous evolutionary improvement toward a clearly defined end state. The maturity model method is underpinned by the concept of progression. Mature organisations systematically manage business processes in particular ways; and consequently, immature organisations can assess and improve their business process capability by following a similar evolutionary path.

In this way, a maturity model framework provides an objective standard against which the state of business process capability can be assessed. In application, maturity models have been used principally for descriptive purposes (to describe the current state of a business process) and prescriptive purposes (to identify strategies for improving a business process) (de Bruin, Rosemann, Freeze and Kulkarni, 2005, Rölinger, Pöppelbuß and Becker, 2012). However, they also have the potential to be used as a comparative framework for benchmarking common business process practice within an industry.

Assessment against a maturity model generally occurs through a process of self-assessment, though, some approaches involve an independent assessor. This assessment (usually made by the senior executive of the organisation) will include current business process management maturity but may also include an assessment of 'required' level (or the maturity level to which they would like to more toward over a specified timeframe). The gap between current and required describes a path along which the organisation intends move by systematically improving business process capability.

There has been growing research interest in maturity models with a number of recent reviews seeking to consolidate and categorise the research into maturity models (Looy, Backer, Poels and Snoeck, 2013, Wendler, 2012; Staples and Niazi, 2008, Hansen, Rose and Tjørnehøj, 2004). The reviews highlight that much of the research focus has been on understanding and improving the validity of maturity models as assessment tools and providing criteria for selecting the most appropriate model to apply. There has also been focused research into improving the quality of maturity models as tools for managers (McCormack, Willems, van den Bergh, Deschoolmeester, Willaert, Štemberger, Škrinjar, Trkman, Ladeira, de Oliveira, Vuksic, Vlahovic, 2009) and drawing together similar business process management frameworks into a more complete assessment methodologies (Moradi-Moghadam and Safari, 2013). Most recently, Forstener, Kamprath and Rölinger (2014) have applied decision making and economic analysis to better understand the relationships that govern capability development based on maturity models.

The more targeted research approaches address persistent criticism of maturity model methodologies. Rölinger, Pöppelbuß and Becker (2012) provide a summary of the research community's criticism of maturity models. These criticisms include technical issues such as a lack of validation in the development of the models (Wendler, 2012), limited guidance to improve performance (Becker et al., 2009; Iversen et al., 1999), and step-by-step process 'recipes' that lack a robust empirical foundation (Benbasat et al., 1984; King and Kraemer, 1984; de Bruin et al., 2005; McCormack et al., 2009).

Other concerns are more philosophical. For example, maturity models often are seen to offer highly prescriptive improvement path that neglects alternative approaches (Teo and King, 1997). They provide only a narrow definition of business process factors that ignore internal or external forces that might influence process improvement (Mettler and Rohner, 2009). While others have suggested that they focus on a predefined 'end state' instead of the factors that actually influence evolution and change through to the application (King and Kraemer, 1984).

There has also been consistent concern over the non-reflective application of maturity models as a substitute for engagement with the issues associated with business process improvement (Becker et al., 2009, 2010; Iversen et al., 1999). For example, Rölinger, Pöppelbuß and Becker (2012) analysed a sample of business process management maturity models and found that while the models analysed adequately addressed the basic development and descriptive design principles, the criteria for prescriptive use were rarely met. Consequently, the models provided limited guidance for implementing improvement measures. Reviews on the application of maturity models as a comparative measure—positive or negative—are not available.

While comparative applications are referred to in the research literature, it has not been an area for research. Much of the focus in the research literature is on the development of maturity models and descriptive uses. This may reflect the novelty of maturity models as a focus of research. However, the practitioner literature where software maturity models were originally developed and have been in use since the late 1980s (Humphrey, 2007; Humphrey, 1988), is also quiet on applying maturity models for comparative purposes.

Combined, the capability review and maturity model methods provide different perspectives on APS capability and the over 100 APS agencies that it encompasses. This paper focuses on the

implementation and application of the maturity model approach in 2011 and 2013 as a means to assess organisational capability through business process maturity. In particular, it concentrates on the use of a maturity model as a comparative tool within an industry, in this case, the APS.

Drawing on data collected by the Australian Public Service Commission in 2011 and 2013, this article explores the comparative use of a maturity model within the APS. It examines both the gap between assessments of current and required states in 2011 and 2013 as well as the differences between the two states from 2011 to 2013. It concludes with a discussion of the implications measuring organisation capability through business process management in public sector organisations.

METHOD

Data

All APS agencies are required to complete an annual survey (the Agency Survey) which addresses a broad range of organisational issues including an estimate of their current and future (i.e., within the next three years) position on a five-level Capability Maturity Model (CMM)(see Appendix 1 for a detailed description of this). The CMM was included in the 2011 Agency Survey and the 2013 Agency Survey. The 2011 CMM originally assessed 13 organisational capabilities, these were refined in 2013 based on results from the capability review. Seven of the original capabilities were removed and two new capabilities added, the six capabilities measured in both are:

- Risk Management

- Change Management

- Workforce Planning

- Staff Performance Management

- Stakeholder Engagement

- Strategic Planning

Sample

The APS employs almost 160,000 staff in 100 agencies ranging in size from almost 35,000 staff to less than ten. The nature of the work done by agencies is very diverse and the APS classifies agencies into five functional clusters: specialist, regulatory, policy, small operational and large operational (Australian Public Service Commission, 2012).

As part of the Agency Survey process, agencies with less than 20 full time APS employees are not required to complete all parts of the Agency Survey, and this included the CMM. Of the agencies that did complete the CMM, 76 completed it in both 2011 and 2013 – some agencies were established after 2011 and some that completed the 2011 CMM were disestablished by 2013. Of the agencies completing both the 211 and 2013 CMM nine were large operational agencies, 12 regulatory agencies, 17 each were policy and small operational agencies, and 21 were specialist agencies. Content of the completed Agency Survey has to be approved by the agency head.

Measures

From the four data points in the dataset for each agency (current and required capability levels for both 2011 and 2013 scored on a 1-5 scale) three measures were calculated for analysis purposes. These were the difference in current capability scores from 2011 to 2013, the difference in required capability from 2011 to 2013, and the difference in the 'gap' between current and required capability scores in 2011 and the gap in 2013. To assist interpretation and presentation, these measures were also dichotomised to reflect agencies that showed:

- an increase in their current capability from 2011 to 2013

- an increase in their required capability from 2011 to 2013

- a reduction in their capability gap from 2011 to 2013.

Because the sample included all APS agencies that had data points for both years, analyses of these data were based on direct comparisons of differences in capability assessment or percentage of agencies showing a reduction in their capability gap.

RESULTS

Descriptive Analyses

Initial analyses of the data included examination of the distribution of capability gaps for 2011 and

2013 across the five functional clusters of agencies; these are shown in Tables 1 and 2 respectively

below (note that values more than one standard deviation above the mean are highlighted in bold).

Insert Table 1 here

Insert Table 2 here

Examination of the data in these tables shows that there is considerable variation in gaps in capability

across agency clusters and between the capabilities themselves. Data from 2011 shows that workforce

planning is the least well developed capability (i.e., the overall capability gap is greatest) and that the

variation in capability gap is greatest also, ranging from 0.905 to 2.083. Risk management, on the

other hand, is the most mature capability and shows the least variation across agency clusters.

The data for 2013 shows that, with the exception of workforce planning, average capability gaps

decreased for all capabilities. The pattern of variation among and within capabilities is similar to 2011

with workforce planning remaining the least mature (although the variation has decreased) while the

capability gap for strategic planning is now the smallest across all agencies.

Comparative analyses

The percentage of agencies that showed an increase in current capabilities between 2011 and 2013

across functional clusters for each capability is shown in Table 3 below (percentages more than one

standard deviation above the mean is highlighted in bold).

Insert Table 3 here

This data shows that with two exceptions (stakeholder engagement and workforce planning, both in

Regulatory agencies) less than half of the agencies in each cluster reported an increase in current

levels of capability from 2011 to 2013. Agencies were most likely to show an increase in stakeholder

engagement while they were least likely to show an improvement in their performance management capability.

Changes in required levels of capability are shown in Table 4 below (percentages more than one standard deviation above the mean are highlighted in bold).

Insert Table 4 here

Examination of this data shows that the changes are more consistent, that is, the percentage of agencies reporting an increase in required capability was generally less than that for current capability, suggesting that agencies might have been more accurate in estimating their required levels of capability than their current levels.

The percentage of agencies by cluster who reported a reduction in their capability 'gap' from 2011 to 2013 are shown in Table 5 below (percentages more than one standard deviation above the mean are highlighted in bold).

Insert Table 5 here

Examination of the data in this table shows considerable variety in the improvement in capability across the agency types. Stakeholder engagement and strategic planning show the greatest levels of improvement, while workforce planning has the fewest agencies reporting an improvement in this capability. Both workforce planning and performance management show the greatest variation in capability gap reduction (ranging from 11% in Large Operational agencies to 59% in Policy agencies).

DISCUSSION

The data presented above shows that substantial variation in capability maturity exists among APS agencies within functional clusters and also between capabilities and contributes considerably to an understanding of the capability 'maturity' within the APS. There are two particular features to this

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model that provide an extra degree of sophistication to this understanding: first, assessments are made over time; and second, agencies self-assess their current maturity level for each capability as well as the maturity level they believe they **require** to do their business effectively.

By comparing **current** capability over time, an assessment of whether agency capability has actually 'matured'; that is, has increased, can be made; this allows agencies to evaluate the progress of earlier capability investments. By comparing their required level of capability maturity over time, agencies are able to identify how their changing business context has influenced their capability requirements; it assists agencies make a critical assessment of their likely future business and what this means for investment decisions in their business processes.

More importantly, by examining the **gap** between current and future requirements, agencies can determine where they might most profitably invest their resources to improve capability acrois their business processes. This assumes a different view of 'maturity' in that business process maturity is not affected by simple constant improvement, but rather by accurately assessing business needs and matching business process maturity to actual business need. This then allows agencies to evaluate how effective their efforts have been at improving their business processes where the need is greatest. When looked at across an industry, in this case the APS, it assists in identifying systemic areas of weakness to which resources can be allocated with greatest effect – in the APS one area where this can be seen is in the workforce planning capability.

Workforce planning capability offers a worked example of the additional insight provided by maturity models. Workforce planning has been consistently identified as an APS capability weakness. In 2010, the Advisory Committee on reform in the APS (Advisory Group on Reform of Australian Government Administration, 2010) placed a specific emphasis on improving workforce planning capability. In 2009, 21 per cent of agencies had workforce plans. After focused effort on improving workforce planning knowledge and practice across the APS, the number of agencies with workforce plans had

increased to 40 per cent in 2012. However, in 2013 this figure appeared to be plateauing at 42 per cent. Concurrently, the capability reviews undertaken by the APS had identified that while workforce planning is operating very well in some agencies, in others business and workforce resourcing decisions were not supported by formal or effective workforce planning processes.

The 2011 and 2013 maturity model results for workforce planning reported in this paper provide an additional insight into the state of workforce planning as a business process in the APS. The 2011 comparisons confirm the investment decision in workforce planning was justified. In 2011, workforce showed the largest gap between current and required capability but also that this was greatest for regulatory agencies (Table 1). The same comparison for 2013 shows that while the gap between current and required workforce planning capability remained the largest, the variability across the agency functions had been reduced (Table 2). So, while the number of agencies with workforce plans was increasing across the APS there was a concurrent contraction in the variability of agency assessment of workforce planning maturity. Overall, this seems to be consistent with the strategy adopted by the APS in 2010 which focused on improving workforce planning knowledge and practice across the APS.

The comparison of current maturity assessments in 2011 and 2013 for workforce planning confirms an improvement in assessments of current capability with the largest improvement in the poorest performing area, regulatory agencies. In assessments of required capability in 2011 and 2013, workforce planning shows the least improvement; in that, agency assessments of the required capability showed little movement. This comparison raises and reinforces our concern with the validity of the idea of growth that underpins maturity models in general. Is it always essential for an organisation to aspire toward higher levels of maturity, or is it satisfactory for an organisation to meet its business objective with a particular capability (such as workforce planning) at, for example, level three rather than level four or five? The lack of movement in the comparison of required assessments presented in this paper does not provide a definitive answer. However, it may be that agency

aspirations for each capability are relatively stable for the outset. A closer examination of what occurs once an agency has achieved an aspirational level would reveal more about the next phase of behaviour. The documentation of the movement through a maturity model and mapping the key investment decisions points completed by McCormack et al (2009) provides a different approach and perspective on this issue. Similarly, the more recent introduction of decision framework and economic analysis provides additional insight (Forstner, et al., 2014).

Overall, when tracked over time, the business process maturity model approach offers important insights into organisational capability. It provides a measure of variability in capability development across an institution and the extent to which improvement is occurring. In the example of workforce planning, the measurement of maturity provides more detailed insights beyond the simpler measures that have previously been relied on to inform strategy development. Similarly, the maturity model analysis has informed additional data collection in 2014 that will focus on what actions agencies have undertaken to improve each of the six capabilities in the previous 12 months. They have also been asked to identify the barriers to improvement. Combined with the maturity model assessment this could inform the development of better targeted management tools such as an improvement roadmap and better practice guide designed to improve the quality of investment decisions.

While the maturity model used in the APS suffers from many of the limitations outlined by Rölinger, et al, 2012; the attempt to provide a firmer evidence base through the application of a maturity model as a comparative assessment of organisational capability has been valuable. It also takes the application of maturity models beyond the usual applications of description and prescription. In the APS, it is one of several lenses on organisational capability that will continue to be developed to inform organisational investment and development decision making.

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APPENDIX 1

	Level 1 Awareness	Level 2 General acceptance	Level 3 Defined	Level 4 Managed	Level 5 Leader/Excellence
Stakeholder engagement	Increasing recognition of the importance of effective stakeholder management to business outcomes.	General acceptance of the importance of stakeholder management to business outcomes, but considerable variance in the organisation's approach due to lack of formal methodologies.	Standard methodologies applied to stakeholder management across the organisation. Tools and databases in place.	As in 3, but with a more centralised, strategic approach to stakeholder management. Tools and data enable strategic analysis of stakeholder issues and performance reporting.	As in 4, but with regular use of lessons learned and feedback loops in place to inform stakeholder engagement strategies. Measurable benefits.
Strategic planning	Increasing recognition of the importance of strategic planning to deliver on business outcomes. Organisation's overall strategy still being developed, including outcomes, benefits and key performance indicators.	Organisation has a clear, achievable and measurable strategy. No process in place to ensure strategy flows through the organisation and aligns with business partners.	Organisation has a clear, coherent and achievable strategy with a single, overarching set of outcomes, aims, objectives and measures of success. While business plans are being developed at different levels of the organisation, no process in place to ensure alignment with the corporate strategy.	As in 3, but with strategy regularly and formally reviewed with input from the Minister(s) and other stakeholders. Strategy is clear about what success looks like and focused on improving the overall quality of life for citizens and benefiting the nation.	As in 4, but the strategy is kept up to date, seizing opportunities when circumstances change. Effective processes in place to ensure strategic alignment with external stakeholders to address crosscutting issues and generate common ownership.
Internal resource allocation	Recognition of the need to manage internal prioritisation and resource allocation.	Acceptance of role of management in allocating internal resources.	Agency has an articulated process for managing internal priorities and resource allocation.	As in 3 but process is built into formal agency planning and processes exist for routine review of internal priorities and resource allocation.	As in 4 but processes exist to allow the agency to reallocate priorities and resources dynamically.

Decision-making	Increasing recognition that there are appropriate levels for decision making in the agency.	Staff and executive seek to make decisions appropriate to their level.	A clear governance framework exists within the organisation defining decision making responsibilities.	The governance framework is efficient and enables managers to delegate responsibility for decision making to appropriate levels.	The overall framework for decision making is effective, managers routinely delegate decision making to the appropriate level and relevant information on decisions is communicated back to managers.
Risk management	Increasing recognition of the importance of effective risk management to achieving business outcomes.	Risks identified and documented, but not actively managed. Pockets of good practice attributable to the skills of individuals within the organisation.	A top-down approach to risk identification, focusing on major organisational initiatives. Some level of bottom-up risk identification, but not integrated into an agency wide risk management process.	As with 3, but with risk centrally managed and ownership of risks clearly understood. Risks to the organisation identified and quantified, and response plans developed and funded. Practices in relation to risk escalation clearly defined.	As with 4, but with the organisation's appetite for risk, and the balance of threats and opportunities across its work, continually reviewed and managed. Senior management owns and oversees risk management across the organisation. Timely and effective escalation of risks to the appropriate level.
Change management	Increasing recognition of the importance of effective change management to achieving business outcomes.	While there is general acceptance of the importance of managing change effectively, it continues to be managed in an ad hoc way. Pockets of good practice attributable to the skills of various individuals.	Formal change management tools and practices implemented. Senior management communicates it's clear and defined vision for organisational change. Some training provided to support change processes.	As with 3, but a more centralised, strategic approach to change management has evolved. Changes to the organisation's strategies and business communicated and championed. Formal program and project management applied to the change process.	As with 4, but with the organisation's leadership now leading and managing change effectively, addressing and overcoming resistance when it occurs. Change continually evaluated and fed into further strategy and policy development.

Workforce planning	Increasing recognition of the importance of workforce planning to business outcomes. Low organisational knowledge of, or technical expertise in, workforce planning. Different parts of the agency manage their own staffing requirements.	While there is general acceptance of the importance of workforce planning to business outcomes, there is no systematic approach to workforce planning. Agency has implemented a workforce planning process.	Workforce planning is systematically integrated with business planning across the organisation. Workforce supply and demand assessments undertaken and human resources management strategies identified.	As with 3, but a more centralised, strategic approach to workforce planning and implementation of human resources strategies across the organisation. People with the right skills in place across the organisation to deliver business objectives.	As with 4, but with regular review of workforce plans and strategies in light of changing business priorities. Measurable benefits.
Staff performance management	Increasing recognition by managers of the importance of performance management to business outcomes.	Agency has set performance management objectives, relevant documentation and guidelines available and formal performance agreements have been developed with staff.	As with 2, but the performance management system aligns individual and agency goals and priorities. Training and support provided to managers to ensure they have the skills to provide high-quality feedback. Performance assessment aligned with agency goals and based on multiple sources of feedback.	As with 3, but with employee performance managed transparently and consistently—rewarding good performance and tackling poor performance. Extensive training and mentoring provided, focusing on personal development and performance improvement.	As with 4, but with high levels of confidence among staff that the performance management system is improving their performance. Employee performance management informs the organisation's workforce and strategic planning through a continual cycle of review and evaluation.

APPENDIX 2

Tables of data

Table 1: Capability Gaps (2011) by Functional Cluster

	Stakeholder Engagement	Strategic Planning	Risk Management	Change Management	Workforce Planning	Performance Management
Large Ops	1.222	1.222	0.889	**1.667**	1.444	1.333
Policy	1.294	1.118	0.824	1.176	1.353	1.412
Regulatory	1.250	1.250	1.000	1.500	**2.083**	1.417
Small Ops	1.235	1.000	1.000	1.118	1.176	1.059
Specialist	0.857	0.619	0.667	0.810	0.905	0.667
Total	1.145	0.987	0.855	1.171	1.316	1.118

Table 2: Capability Gaps (2013) by Functional Cluster

	Stakeholder Engagement	Strategic Planning	Risk Management	Change Management	Workforce Planning	Performance Management
Large Ops	**1.333**	1.000	**1.111**	1.111	1.556	**1.222**
Policy	0.882	0.882	0.824	1.176	1.000	0.882
Regulatory	0.917	0.500	0.667	**1.250**	1.667	0.833
Small Ops	0.882	**1.059**	0.941	1.059	1.529	1.176
Specialist	0.667	0.571	0.714	1.048	1.524	1.048
Total	0.882	0.789	0.829	1.118	1.434	1.026

Table 3: Percentage of agencies reporting an increase in current capability by functional cluster

	Stakeholder Engagement	Strategic Planning	Risk Management	Change Management	Workforce Planning	Performance Management
Large Ops	44%	22%	**44%**	**44%**	22%	22%
Policy	41%	35%	18%	24%	41%	**29%**
Regulatory	**58%**	**42%**	33%	25%	**58%**	25%
Small Ops	35%	12%	24%	18%	12%	12%
Specialist	33%	19%	24%	24%	19%	14%
Total	41%	25%	26%	25%	29%	20%

Table 4: Percentage of agencies reporting an increase in required capability by functional cluster

	Stakeholder Engagement	Strategic Planning	Risk Management	Change Management	Workforce Planning	Performance Management
Large Ops	**33%**	**33%**	33%	22%	22%	11%
Policy	**35%**	29%	24%	29%	12%	12%

Regulatory	17%	8%	25%	8%	17%	8%
Small Ops	24%	18%	**35%**	29%	**29%**	**29%**
Specialist	19%	10%	19%	29%	24%	**33%**
Total	25%	18%	26%	25%	21%	21%

Table 5: Percentage of agencies showing a reduction in capability gap from 2011 to 2013

	Stakeholder Engagement	Strategic Planning	Risk Management	Change Management	Workforce Planning	Performance Management
Large Ops	33%	33%	11%	**56%**	11%	11%
Policy	47%	47%	35%	24%	**59%**	59%
Regulatory	58%	**67%**	50%	42%	50%	58%
Small Ops	53%	41%	47%	47%	24%	41%
Specialist	57%	62%	38%	38%	14%	38%
Total	51%	51%	38%	39%	32%	43%