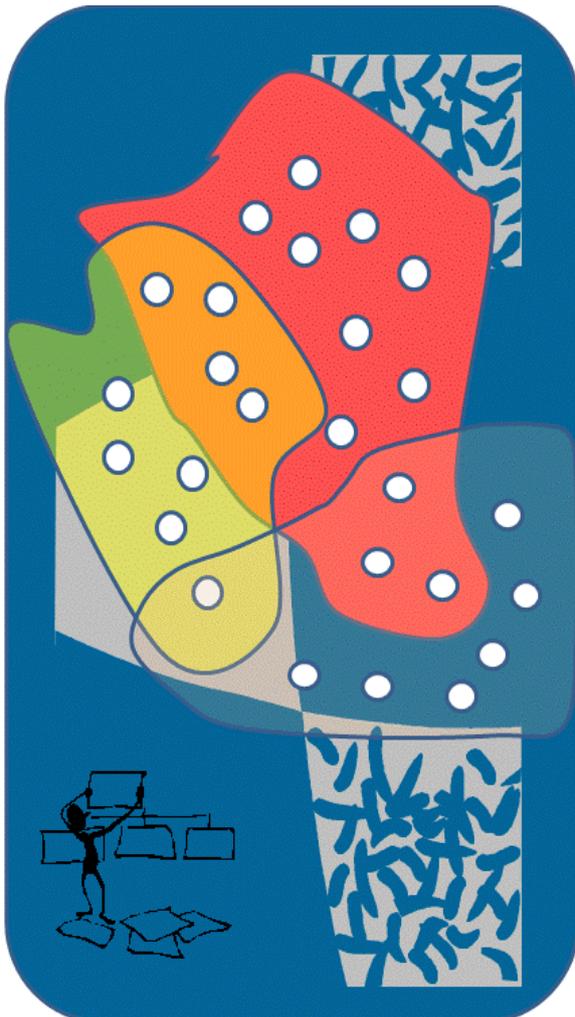


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Practice Guide 14

Capability Planning and Analysis

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By Lawrence Wilkes

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Independent Guidance *for* Service
Architecture and Engineering



Capability Planning and Analysis

The Capability concept is widely accepted as a useful technique to bridge the business perspective and the service architecture. But capability identification is frequently as far as it goes. Our experience is that capability can provide a really powerful mechanism to justify, drive and govern service delivery and provide integrated business and IT planning and management. This report outlines a structured approach to the analysis and planning of business and IT capabilities.

By Lawrence Wilkes

Introduction

A business capability is the power or ability to perform something of value to your enterprise. A capability defines what your enterprise is capable of doing, without stating or limiting how it is done.

By way of contrast, a business process, when decomposed into elementary processes and flows, describes what happens in response to a business event. So it explains how the process is carried out to a fair level of detail. A business process could make use of several business capabilities to achieve the required outcome.

For example, a fulfillment process would require the services of several logistics capabilities. A logistics capability may decompose into capabilities supporting storage, scheduling, transportation, etc, which are used by the steps in the fulfillment process. These required capabilities can be identified without determining specifically how they are done.

At the same time, a coarse-grained business capability might itself be implemented by business processes: each high level function of the capability could be realized by a process, which in turn uses several smaller-grained business capabilities. The concept therefore can be viewed as recursive.

Confused? As well you might be. In fact assessments of numerous capability analyses show a high level of variability in the way capabilities are identified and defined, which may mean the purpose of the exercise has been compromised right at the outset. So a consistent approach in capability identification is essential.

Characteristics of a Business Capability

As shown in Table 1, a key characteristic of a business capability is that it should be enduring, and should outlive the business processes or the way it is realized at any moment. While the consuming business processes and the providing realization of the capability come and go, or get reengineered, the capability is likely to remain remarkably constant. For example, a company will always have the capability to “sell goods or services”. How they are sold – by sales people or ecommerce – or where sales fits into the end-to-end business processes, or what the process of selling involves, or how the company is organized to perform selling, will constantly evolve. But as long as that company stays in business you would assume it will always possess the capability to “sell goods or services”.

There is no reason why CP&A should be applied only to the business capabilities. It could be applied to any domain, either business or technical. In CDBI-SAE we have for example applied the concepts to SOA adoption.



In this report we provide a structured approach to identifying, analyzing and managing the full lifecycle of a capability in an integrated way across the business and IT domains. We are interested in its place in the business model, plus how and where it is implemented, and how well that implementation is performing. We are not divorcing capability from realization and only dealing with the abstract. This is not meant to be a theoretical exercise!

Enduring	A capability should outlive changes to how it is realized or the business processes that use it
Process Independent	The same business capability may be useful within several business processes
Realization (Implementation) Independent	<p>The capability definition should be independent of how, where or by whom the capability is realized</p> <p>The capability definition (stating the distinct actions it offers) does not pre-empt how each action gets carried out internally</p> <p>The capability's internal processes could be changed while still conforming to the capability definition.</p>
Dependency	<p>A capability may depend upon another, in the sense it:</p> <ul style="list-style-type: none"> • needs some other capability to have been exercised first (temporal dependency) • it utilizes some finer-grained capability when performing one of its actions (internal dependency) <p>Some capabilities can be independent or self-contained</p>
Measurable	A capability's performance must be measurable

Table 1 - Characteristics of Capabilities

What is Capability Planning and Analysis?

A capability plan & analysis provides a structured report on current and planned capabilities. For example the capabilities required to provide a logistics service.

As well as providing an understanding of the capabilities an organization requires or already possesses, a key purpose of CP&A is to drive decision making.

The capability analysis is usually produced from a combination of

- a modeling exercise to identify the set of capabilities and their dependencies
- together with a data gathering exercise to establish some level of evidence based assessment on the performance or suitability of the current state of a capability usually in terms of its current realization, and to gather input on the planned state based on the outcomes the organization is trying to achieve.

The analysis can use metrics to highlight areas of weakness in the realization of current capabilities, prioritize their improvement or determine the need for the provision of new capabilities, and allow comparison between capabilities as well as

between peer or benchmark organization units where data is available, as well as with current and planned state.

A common use of CP&A is to support the identification of common capabilities that should be shared across an organization, and drive the rationalization of the resources used to realize those capabilities, looking for duplication, inconsistency or gaps.

Capabilities can be analyzed and understood in several dimensions, as illustrated by Figure 1. This includes,

- Organizational: Ownership and responsibilities
- Realization: How the capability is realized (implemented)
- Service: How the capability is provided as a service (physical or software)
- Process: Which processes use the capability or which processes the capability contains
- Dependency: An understanding of the relationships between capabilities
- Commonality: of the realizations
- Value: of the capability to the business
- Metrics: measures of the capabilities performance, etc

Each of these dimensions can be considered on an as-is or to-be basis.

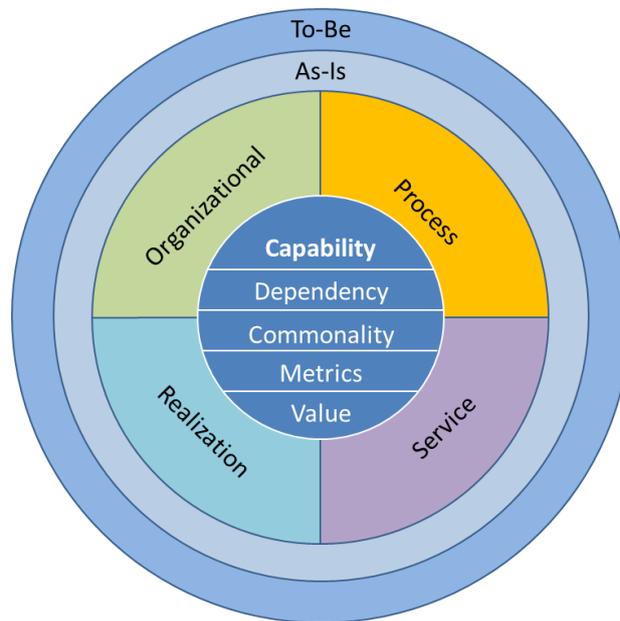


Figure 1 – Capability Planning and Analysis Dimensions

Scope and Approach

The first step is to determine the scope of the capabilities being analyzed.

A high-level enterprise view of capabilities is a useful starting point, with detailed analysis then performed at a narrower unit of scope, such as for the decomposition of one of the high-level capabilities.

Often, we find the scope being analyzed reflects an organizational unit. This isn't ideal if the intention for example is to identify common capabilities and to rationalize



duplicate resources, as the structure of some organizational units will often be orthogonal to the set of logical capabilities. But it reflects that the remit often doesn't extend beyond the boundaries of the sponsoring organizational unit.

However, there is no reason why CP&A cannot be performed on a smaller unit of scope. The rationale would still apply. In the CBI-SAE Knowledgebase there is a list for example of quite narrowly focused capability models¹ such as Service Catalog, Citizen Portal, and SOA Governance. It's just important to understand the context and the appropriate scope.

In most cases it is highly advisable to extend the scope beyond conventional organizational boundaries. This is required not just when there is a collaborative effort by partners in some ecosystem or industry body taking place, but because in today's global economy business processes are increasingly federated.

Even with a narrower scope, there is still a lot of metadata that can be captured – the list presented later is quite exhaustive.

Hence it is useful to prioritize or rank the capabilities to determine which should be analyzed first. Or perhaps only to perform detailed analysis on the top ranking items as a way of further refining the scope of the effort required. This could be a ranking based on

- **Business value.** Which ones are of most value to the business?
- **Business outcomes.** Which ones are most necessary to achieve the desired outcome?
- **Improvement areas.** Which ones are the weakest and must be improved?
- **Common Capabilities.** Focus on capabilities that are common across the enterprise and should be standardized
- **Core vs Context.** Or a demarcation of core vs context, with the focus on prioritizing core for investment and reducing the cost of context. Or to support a strategy of insourcing core whilst outsourcing context

A common technique would be to develop a 'heat map' for the capabilities based on such rankings.

Then detail the properties for the highest ranked capabilities, so work can commence on their realization or improvement.

Deciding which of these ranking areas is most relevant will be determined by the broader objective for using CP&A. For example, CP&A may be used in support of business improvement, portfolio rationalization or modernization, or merger and acquisition. The objective will then determine the general CP&A approach that will be taken. We examine this in more detail in an associated report, "Using Capability Planning and Analysis"².

Capability Modeling

Capability Decomposition

Having determined the scope and approach, then next step is to model the set of capabilities.

Start by constructing a decomposition of the capabilities in scope. The purpose is to

- Provide a systematic breakdown of the domain from coarse-grained capabilities into finer-grained capabilities that are easier to conceive, measure and compare
- Identify implementation independent capabilities
- Identify the leaf node capabilities so that independent decisions about their realization can be made

Figure 2 shows an example capability decomposition of part of Human Resource Management. *Financial Management and Resource Management capabilities are also shown as these will be referred to later.*

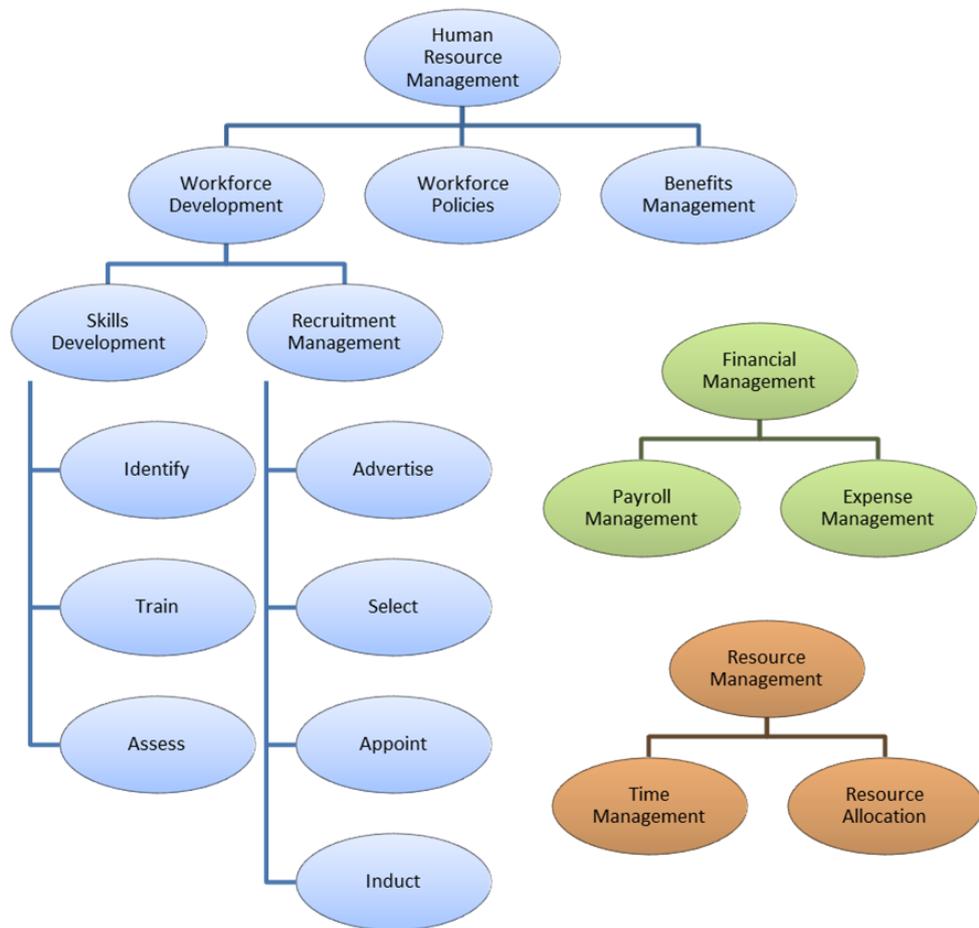


Figure 2 – Example Capability Decompositions

Ideally this should be done top-down, starting with a list of business outcomes as explained earlier, identifying and decomposing the set of capabilities required to achieve those outcomes.

With rationalization in mind, it is not uncommon to start with a list of existing functions, systems, even products which reflect how the capability is currently realized. So the need here is to abstract these into a set of implementation independent capabilities.



In most cases it is likely to be iterative, starting top-down and then using bottom-up analysis of the existing realizations as a useful cross check.

This also enables gap analysis. Understanding what gaps exist in terms of the top-down decomposition of the capabilities required and bottom-up analysis of the existing coverage.

You might also classify the capability level as a means to ensure you have thought about all the different levels of capability, not just the operational capabilities. i.e. the ability to set the strategy that will be followed by a capability, the ability to control a capability, and not just the ability to execute the capability. At a high-level in the decomposition, a coarse-grained capability would encompass all these, and in its decomposition you may expect to find strategy setting capabilities, controlling capabilities, and executing capabilities.

Basic Properties

For each capability in the decomposition then complete the basic properties listed in table 2.

Property	Value	Example
Capability Name	A unique name that would be widely understood by people familiar with the domain, to mean what is stated in the definitions and description below A naming convention of Noun Verb is adopted to differentiate from Verb Noun which is more frequently used in naming processes and functions. E.g. Order Management rather than Manage Order.	Skills Development
Implementation Independent Definition	Definition of capability that does not imply its implementation	Ability to develop the skills required by the company of its workforce
Description	A narrative description of this capability	
Synonyms	Other common names for the capability	Training
Domain	The domain to which this capability has been assigned	Human Resources
Outcomes or Purpose	The outcomes that this capability is uniquely responsible for, or its purpose	Skilled workforce Just-enough Resources+Skills to meet demand

Property	Value	Example
Acts or functions of this capability	List of one or many distinct functions which together constitute the total capability. Remember these acts define what's in the capability not how it's done.	
Resource Responsibility	The resources that this capability is uniquely responsible for (could be list of Business Types)	Skill Employee Skill
Stability	Probability of change, or frequency of change See Business Agility Assessment ³	Low (training approaches keep evolving)
Level	Strategic Command & Control Execution/Operation	Execution
Measurable	How the performance of the capability can be measured	Skills match Employee Retention

Table 2 – Basic Properties of Capabilities

Some further examples of the basic properties for the human resource management capabilities are shown in table 3.

Capability Name	Implementation Independent Definition	Business Outcomes	Stability	Measureable
Workforce Development	ability to acquire and develop the skills required by the company of its workforce	Skilled workforce; Just-enough Resources		
<ul style="list-style-type: none"> Skills Development 	ability to develop the skills required by the company of its workforce	Just-enough skills	Low	Skills match; Employee Retention
<ul style="list-style-type: none"> Recruitment Management 	ability to acquire the skills required by the company of its workforce	Resource availability	High	Resource levels; Time to recruit
Workforce Relations	ability to manage the relationship between employer and employees	Satisfied workforce	High	Employee Retention

Capability Name	Implementation Independent Definition	Business Outcomes	Stability	Measureable
Workforce Policies	ability to set and enforce policies that guide the workforce and its management		Medium	Policy compliance
Benefits Management	ability to manage employee benefits on behalf of employees	Motivated workforce	Medium	Employee Retention

Table 3 – Example basic properties

Capability Dependency

Whilst the decomposition provides the breakdown of the capabilities it does not show the extent to which they are dependent on each other.

Capability dependency models the association between two capabilities indicating that one capability is dependent upon the other capability. The purpose is to understand dependencies and their effects. E.g. Capability A cannot achieve the required outcomes unless Capability B also exists.

This can be qualified as either a

- Hard dependency. Capability A would be impossible without B
- Soft dependency. Capability A would be possible without B, but B would significantly improve A, or reduce the risk of providing A.

There is extensive coverage of how to perform capability dependency analysis in our Knowledgebase⁴ and in CBDI Journal reports⁵, and so it is not repeated here.

Figure 3 shows an example and dependency. The ability to pay employees is dependent on the ability to manage benefits, and on the ability to manage time (as in time recording of work). Resource allocation is dependent on the ability of the workforce to possess the appropriate skills. The ability to recruit is dependent on the ability to set various workforce policies, as is the ability to manage expenses.

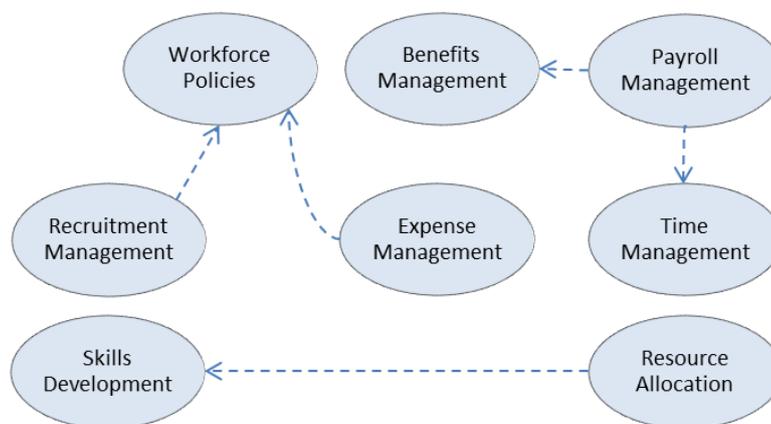


Figure 3 - Example Capability Dependency



Organizational Roles

Capabilities can be assigned to different roles, or organizational units have responsibility for, or possess a capability.

This could include 3rd parties. For example, a capability required by an organization might be possessed (provided) by a 3rd party, so their name (or type if the instance isn't known) can be recorded.

Whereas the responsibility for the capability – as in making sure it is provided or deciding who provides it – would typically be a role within the organization. As would managing the provision of that capability on a day to day basis.

The main purpose of completing this is when

- organizational change is taking place alongside CP&A. Supporting organizational change may be an important outcome of the activity – such as when rationalizing the capabilities of an as-is organization, or planning the capabilities of the to-be organization.
- When an ecosystem-wide view has been taken and potential participation by different organizations (or types) is being analyzed
- Or when core vs context classification is being used to drive outsourcing or build vs buy decisions.

Capability Analysis

As illustrated in Figure 1, CP&A should ask a number of strategic questions across various dimensions. As well as providing a better understanding of the capabilities and their realization, this will help to determine priorities in capability improvement and/or rationalization.

Business Value

A key factor in prioritizing capabilities will be an understanding of the business value of the capability. The business value will normally be associated to a business outcome that it helps achieve.

Business value may be expressed in terms of revenue impact, cost or time avoidance, IP protection, or risk.

You might collect specific financial or time/effort values if known, but more likely it is going to be based on a subjective assessment by those involved of the relative values of each capability in terms of how significant a contribution the optimization of this capability makes towards the business outcome.

The capability should also be classified as these can also be used to prioritize capabilities, or to reduce the scope of the CP&A exercise. For example

- Classify as Core or Context and prioritize work on the core
- Classify the capability level as strategic, execution, or control and prioritize on strategic

The purpose is to determine how important the capability is to the business (or domain). As a consequence you can then

- Prioritize detailed CP&A. Focus detailed analysis only on the highest ranking capabilities



- And subsequently prioritize capability delivery

As-Is Model

CP&A may be performed for both the as-is and to-be states. In the business improvement approach for example the objective is to understand what the current status of a capability is, and set targets for its improvement.

The first task is to identify how and where a capability is already implemented or realized, and then to assess its current status.

This might be an indication of the maturity level – for example you might apply a CMMI-like level to each capability.

Or it may contain a detailed analysis of more specific issues such as the extent to which the implementation of a capability is duplicated or inconsistent, the operational costs or service levels provided, or how well it can respond to change

In some cases you may need to collect some of this data on a per-implementation basis. If the intention is to rationalize capabilities, then the assessment may be based on a comparison of each current implementation.

The main purpose here is to identify what issues there are with the current implementation(s) if any.

As-Is Metrics

More detailed metrics might also be collected to support decision making such as the number of executions and the cost per execution, or the number of errors per execution. This might also be on a per-implementation basis if rationalization comparisons are being made, or a sum of all implementations.

You might only decide to collect some of these metrics when a capability is recognized as problematic and hence there is a need to better understand just how much of a problem it presents.

The purpose is to more accurately quantify or justify any decisions.

To-Be Model

In the to-be analysis, as well as identifying candidate implementations, determine the target factor by which the business values identified in the as-is analysis should be improved. Similarly capture the desired status of the specific issues documented in the as-is. Again tie to outcomes.

As well as identifying the to-be capabilities, the purpose is to

- Prioritize capability delivery
- Prioritize CP&A
- Identify target states

To-Be Metrics

As with the as-is metrics, more detailed metrics might also be proposed to support decision making. It is likely that the target factor captured in the to-be model rather than a specific metric is likely to be sufficient indicators. But if there are some specific goals these can be collected.



Service Delivery Mechanism

The purpose of this section is to document understanding of how the capability is delivered as a service, or will be in the target state. This might be analyzed in further detail when the main purpose of the exercise is to understand how it is delivered as a software service.

This may include forward looking ideas as to whether the capability could be provided on a Software as a Service (SaaS) basis, or whether SOA specific interfaces should be provided by any software implementation, or just regular user interfaces.

In some cases a capability may be provided by all of these mechanisms. If different functions of the capability are provided by different mechanisms then this might be an indication that further decomposition would be useful so that the specific capability can be more accurately assigned.

For example at a high level, Sales – the ability to sell goods or services – might be realized by sales people (a physical service) and by ecommerce (a software service). Whereas on decomposition, it might be seen that the ability to negotiate contracts is performed by sales people, whereas the ability to take orders is always performed by software - as part of the ecommerce system. Whether entered by the sales person or by the customer themselves.

Similarly, if only part of a capability is offered as an externally visible service (the part that consumers of the capability would see), then that may be another reason to decompose the capability further to identify separately the externally visible and the encapsulated aspects.

Commonality

The purpose of this section is to understand what requirements there are for the standardization of the capability, or provision for the sharing or reuse of the capability.

Standardization, sharing or reuse doesn't mean that there must be single shared implementation instance of the capability. There may be more than one instance deployed, but each should comply with the "standard". That is, there should not be divergence.

This should be considered in terms of the applicability of the capability. For example is it to be used or shared on just a regional or global basis, or on just a divisional or an enterprise basis?

Understanding this is required when the objective is to

- Drive rationalization decisions
- Determine ideal implementation approach based on commonality needs

Processes and Events

Finally though not always necessary in terms of analyzing the capability itself, it can be useful to gather information regarding

- Which business processes require the capability
- Which business processes if any are encapsulated inside the capability – usually only relevant to the high level view or coarse-grained capabilities

- Which events trigger an execution of the capability

This information is likely to be known to the team involved in the CP&A activity.

You might add a link to any associated business process models.

The purpose of this activity is that it

- Provides a useful cross-reference as to how the capability is used
- Provides a cross-check that the capability is actually needed
- Helps to rank capabilities when the business process itself is recognized as important or strategic

Tooling

Capability Decomposition and Dependency can be visualized in modeling tools such as various UML or Enterprise Architecture modeling tools. The CBDI-SAE UML Profile for SOA⁶ provides for both. The CBDI-SAE UML Profile for SOA also allows the basic properties of capabilities to be captured. Most UML Modeling tools provide extensibility features that would allow the further properties in this report to be captured.

That said, the more business-centric (and less UML-centric) Enterprise Architecture tools such as Casewise Modeler, or Salamander MooD are probably more appropriate for the activities described in this report that involve ranking and sorting lists of capabilities, and comparing as-is and to-be models.

However, we imagine that most people will use a tried and trusted spreadsheet approach. As just indicated, several of the activities outlined here are best served by some kind of spreadsheet functionality. As shown in Figure 4 for example, it is straightforward to sort capabilities based on ranking, and to use features such as conditional formatting to provide a rudimentary heat map.

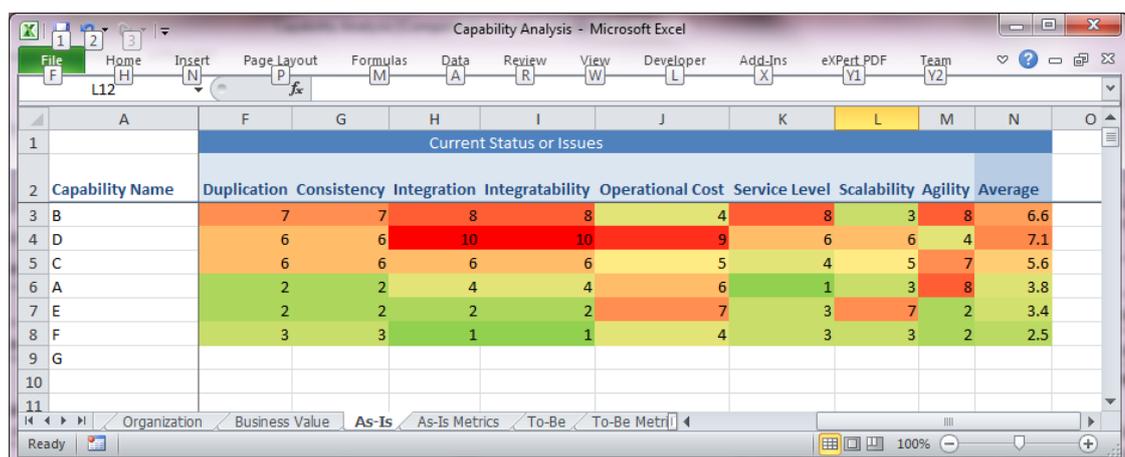


Figure 4 - Ranking As-Is Capabilities in an Excel spreadsheet



Summary

In summary, CP&A as outlined in this report provides a structured approach by which to determine the capabilities an organization requires, and to prioritize their provision or improvement.

CP&A might be seen as Enterprise Architecture (EA) like in nature, and business capabilities may be recognized by EA frameworks such as TOGAF. TOGAF includes Capability Assessment as an architecture deliverable⁷. The techniques and meta model provided by our guidance as outlined in this report provide a suitable basis for producing that deliverable.

However, there is no need for it to be performed at the enterprise level, as explained in scoping. Moreover, to achieve the desired business or IT objective it is necessary to go to a further level of detail and decomposition than may be usual in most EA projects. Though someone with an enterprise architect role would be well suited to performing this task.

Further Resources

A more complete version of this report is provided as guidance to our CBI-SAE Knowledgebase subscribers. It contains a complete set of detailed properties for each of the sections of the capability analysis outlined here.

We have also provided this as an Excel spreadsheet containing all the properties in the detailed report, complete with conditional formatting and various lookup values pre-assigned. This is also available to our Knowledgebase subscribers.

¹ Capability Dependency Models

<http://www.soakb.com/knowledgebase/Lists/Capability%20Dependency%20Models/Menu%20View.aspx>

² Using Capability Planning and Analysis. CBI Journal, Oct 2011

³ Business Agility Assessment

<http://www.soakb.com/knowledgebase/Lists/Artifacts/DispForm.aspx?ID=362>

⁴ Capability Dependency Analysis

<http://www.soakb.com/knowledgebase/Guidance/Capability%20Dependency%20Analysis.aspx>

⁵ Business Modeling for SOA – Capabilities. CBI Journal, Jan 2006

⁶ Download at <http://everware-cbi.com/cbi-sae-umlprofile>

⁷ TOGAF Capability Assessment http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap36.html#tag_36_02_10



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