

How can I improve my application services?

HOW ASL AND CMMI CAN HELP WITH THIS.

ICT managers and consultants frequently use CMM or ASL to structure and improve processes in the applications domain. Now that it has been announced that CMM will no longer be supported, it is time to examine what the introduction of CMMI means in this domain. In what situations will organisations be able to focus more closely on CMMI and exactly when should they move to ASL? In what way can both models be utilised to such an extent that they complement each other?

This article provides an answer to the above questions and describes the strengths, similarities and differences of both models.

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INTRODUCTION

The following two models are currently used in the Netherlands to professionalise organisations which develop, maintain and/or renovate applications: CMM (*Capability Maturity Model* – Paulk, 1993) and ASL (*Application Services Library* – Van der Pols, 2001; Meijer-Veldman, 2001).

CMM is a growth model which is specifically designed to professionalise organisations responsible for the development and large-scale renovation of applications. Since its inception in 1991 this model has become the de facto standard for organisations which provide these services. CMMI (CMM Integrated), the successor to CMM, has been available to professionalise and/or structure application services since the beginning of 2002.

An ASL framework has been on the market since 2001. This framework offers organisations a guideline for structuring and improving application management (managing, maintaining and renovating applications). It consists of a coherent schedule of processes along with descriptions of the latter and best practices. There is a growing interest in ASL and many companies in the Netherlands are now using it. Each of these models has its own core area of concern and strengths, which means that they can be used well together within an organisation. This has been explained in previous publications and has also shown itself to be the case in practice. Nevertheless, it remains a difficult issue for many IT managers to select the most suitable methods for themselves and to implement them in combination with each other.

As consultants active in the area of professionalising and improving quality, on several occasions in the field both authors have been confronted with the question as to how ASL, CMM and CMMI relate to each other or how they can be used together. Based on their practical experience and the literature that has been published on both subjects, this article sets out the similarities and differences involved in using them as growth models moving towards a more mature ICT organisation. In doing so, the domains of application development and IT management are first explained and ASL, CMM and CMMI are briefly described. ASL and CMMI are then compared with each other from various vantage points and the use of both growth models is explained in greater detail both together and on their own. The article ends with a concise summary and the most important conclusions.

APPLICATION DEVELOPMENT AND MANAGEMENT

Application development organisations build new Information Systems. These organisations are usually of a highly innovative nature and prefer to focus on new technology.

Applications constitute an important component of an information system. In general, new applications are developed by adopting a project-based approach, where necessary in a concretely delineated production line. The various projects are usually kept separate from the line organisation. They can be quite substantial and the changes which a new system entails, are often far-reaching. They are usually managed tightly in order to provide the required functionality and quality within budget and on time. Once an application is ready, the project comes to an end. Within this limited time frame the aspects pertaining to its use, maintenance and operations are often compromised, even if experts in the field of application and technical infrastructure management are involved in application development. Once a newly built system is put into service, a great deal still frequently needs to be organised in order to be able to manage it.

In the Netherlands the breakdown of IT management practice into three areas or IT-management domains (according to Looijen and Delen), namely, business information (systems) management, application management and technical infrastructure management, has now become broadly accepted. We have also broken down management into these three types (see Figure 1). In summary, the features of these three types of management are as follows.

- **Business information systems management¹ (BIM)** covers the retention of the functionality of an ICT facility, so as to ensure that it continues to fit in with business processes. The users' organisation bears ultimate responsibility for this type of management and usually acts as the owner of the information system concerned, and as the customer for the purposes of technical infrastructure management and application management. The tasks involved include, amongst other things, user support, training, drawing up specifications and controlling the business rules of parameter-driven applications.
- **Application management (AM)** involves the management, maintenance and enhancement/renovation of applications in a responsible manner throughout the life cycle of the various business processes. Application management involves responsibility for maintaining and modifying application software, the collection of data and the administration of documentation.
- **Technical infrastructure management² (TIM)** refers to the availability and maintenance of the infrastructure within which applications run, amongst other things. Technical infrastructure management ensures that these facilities can be used. This includes care for the overall technical infrastructure, that is to say the hardware, including the network and desktop infrastructure, the operating system, development tools and so forth. It often occurs within a computer centre together with an organisation that specialises in networks and a department specialising in desktop management.

¹ In former publications often called Functional management, in this and other publications for the sake of simplicity also referred to as Business Information management or Information Management

² In former publications often called Technical management

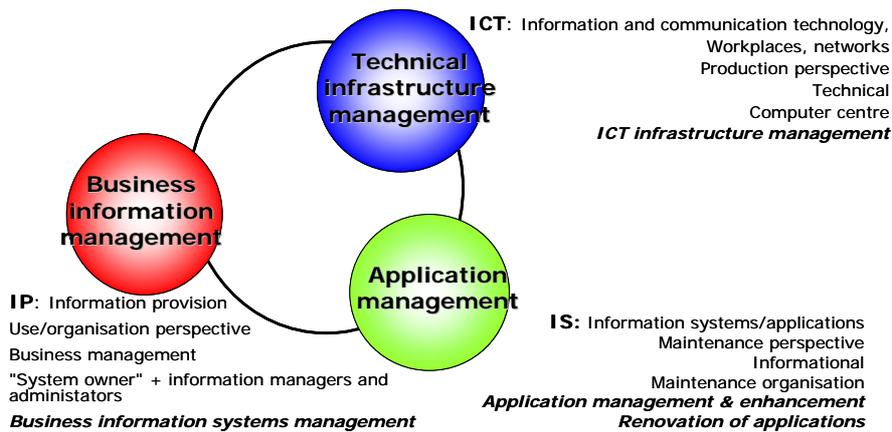


Figure 1 – The three types of management (Looijen and Delen)

In practice one sometimes comes across ICT organisations that have an application development department, alongside one which is involved in technical infrastructure management. For the most part such application development departments regularly appear to perform maintenance on existing applications, which consequently amounts to 'application management' using the terminology described above. When structuring and professionalising these departments, it is certainly relevant to choose from a number of alternative approaches: one which has been developed for project-based application development (new programs), one specifically designed for application management, or a combination of the two.

Before proceeding with a comparison and analysis of the two models based on which it will be easy to make a choice, a brief introduction of CMMI and ASL follows below.

FROM CMM TO CMMI

In the mid-1980s the SEI (Software Engineering Institute) received a commission to develop a 'maturity framework' for ICT organisations which produces applications. After being tested and improved over several years, the SW-CMM model was released in 1991. SW-CMM (or simply 'CMM') stands for Software-Capability Maturity Model. After more than a decade this model has come to be widely known and used on a large scale in virtually all sectors throughout the world.

CMM is a growth model which features five meticulously described levels (analogous to the **staged** type in Figure 2). The 'maturity' and 'capability' of an application development organisation can be situated on a scale based on these levels. Each CMM level is described in detail within a fixed structure of qualitative outcomes. Thanks to these descriptions one can stipulate precisely which process areas need to be covered within a single stage of growth and what needs to occur in it. Consequently, the CMM growth model provides focus and support for one's diagnosis, prioritisation and approach, and this is one of the most important reasons for this model's success.

In order to accommodate the divergent needs relating to the professionalisation of ICT organisations the SEI issued different CMM variants, which were geared to specific disciplines, for example, human resource management (HRM) or dealing with suppliers. However, these variants do not tie in well with each other with regard to their conceptual framework and stages of growth. It is partly for this reason that CMMI has been developed.

CMMI represents a revised comprehensive successor to SW-CMM and several of its variants which has been available since January 2002. The basis of CMMI is identical to that of SW-CMM. Its conceptual framework is more consistent and a **continuous** version was developed, which covers the capabilities of individual processes and not only the maturity of

the entire application development organisation. The process-based conceptualisation which constituted the underlying premise of SW-CMM, applies in its entirety as the basis of CMMI, because a process that is properly described, implemented, managed and executed is still a prerequisite for a sound outcome.

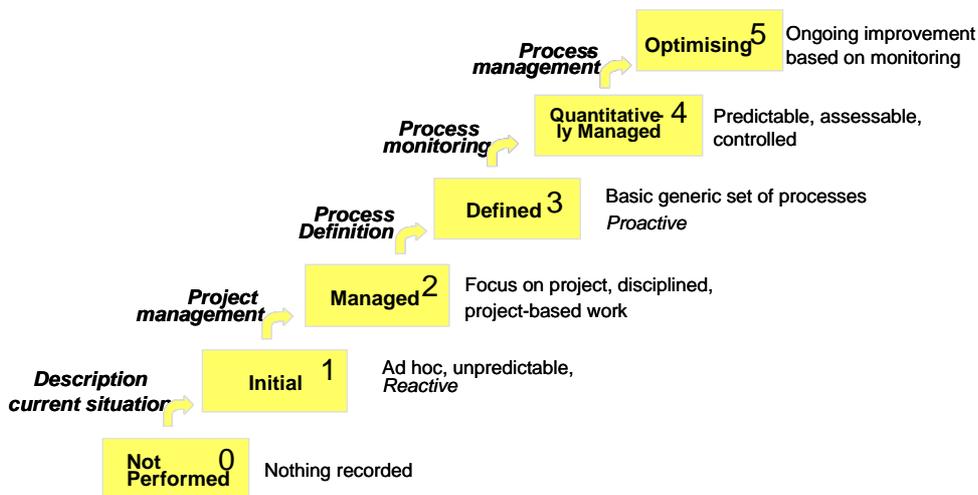


Figure 2 – Maturity levels of CMM: 1-5 Staged, 0-5 Continuous

CMMI is a modular structure based around disciplines. For instance, the SW-CMM for software development is included as CMMI/SW. In addition, there is also a variant available for system engineering in the form of CMMI/SE, that is to say it focuses on the development of overall systems which may or may not include software. At present there are also modules available for integral product development (IPPD) and for dealing with suppliers (SS). It is anticipated that in future the SEI will develop new modules for disciplines such as HRM, architecture and security.

An ICT organisation that wishes to use CMMI, can choose from combinations of these model modules to use the variant which is appropriate for its own situation.

An organisation can also opt for one of two types of CMMI growth model, namely, *staged* and *continuous*. Both forms have their origins in the same product suite, with the result that their substance is actually identical. They are merely structured differently. The staged version remained intact, because CMM was a success as a result, and in order to ensure that no unnecessary break with previous upgrading processes was created for an organisation. The continuous version of CMMI offers scope for choosing a 'tailored' path towards growth.

The makeup of the levels of the two versions differs.

- **CMMI staged** is structured around five *maturity levels* (1-5). As in the case of SW-CMM, it sets out a fixed, prescribed five-stage route for improving processes throughout an organisation. All of the process areas of a maturity level must be appropriately fleshed out and implemented in order to reach a higher one, and only then does it make sense to commence work in the process areas of the next CMMI level. A maturity level refers to the maturity and process-related capability of an organisation in its entirety. The phased growth of 'organisational maturity' is the key element.
- **CMMI continuous** is structured around six *capability levels* (0-5). One can commence work in the various process areas more or less independently of each other. CMMI continuous does not prescribe a route and consequently neither a particular order in which the various processes are implemented, which is unlike the staged approach. It offers organisations an opportunity to use a 'unique growth profile' to focus on those process areas within which the greatest added value is perceived at a particular point in time. In order to guarantee healthy growth, however, CMMI does prescribe how the process areas which are spread over four categories (process management, project

management, support and engineering), must be kept in balance. A capability level refers to the capability of a single specific process area or a group of them. The 'capability of a process' is the key element.

ASL

The purpose of ASL, the Application Services Library, is to professionalise application management, not only within an organisation but also as a standardising factor covering various organisations. Amongst other things, it ties in with ITIL which, as part of its development of best practices, chiefly focuses on the professionalisation of service organisations in the field of technical infrastructure. ASL consists of a framework and library of best practices in the area of application management. In this respect the organisation responsible for application management is the 'entity' which maintains the functionality and operation of the application concerned (the software, database and documentation). ASL seeks to ensure that business processes receive optimum support with the aid of applications throughout their entire life cycle. Within the framework there are six distinct process clusters from the operational to the strategic level.

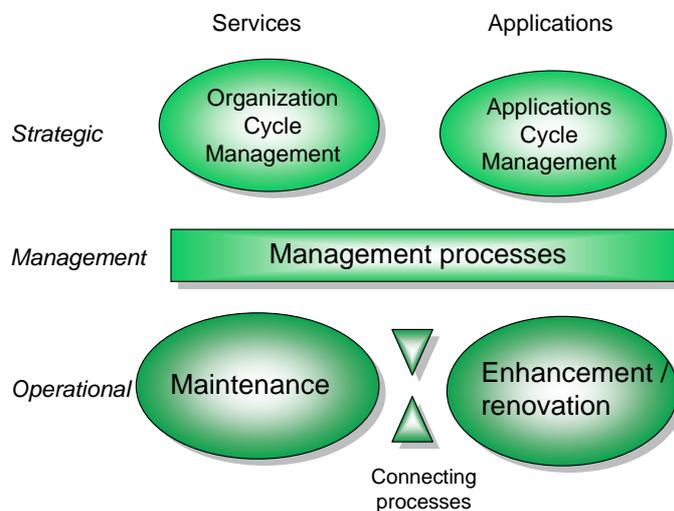


Figure 3 – ASL framework

Figure 3 depicts the ASL framework. Each of the ellipses and the rectangle in the middle represent a cluster of processes. These clusters are dealt with in greater detail below.

Operational processes

Maintenance

In principle, this is the cluster of processes around which everything revolves. Applications are there to be used. Maintenance and control processes are utilised to ensure the optimum use of these applications. These processes (part of application management) ensure that business processes receive the best possible support with the aid of the applications that are in use, with a minimum of resources and as little disruption to operations as possible. This entails ensuring that applications continue to run and that they support an organisation in its day-to-day work. In practice the scope of these operations readily account for 20% to 40% of the activities making up application management.

Enhancement and renovation

Organisations' business processes change. Because information systems are closely related to these business processes, the applications that constitute part of them, need to change with them if they are to be used as best possible. The enhancement and renovation processes ensure that applications (data models, software and documentation) are modified to accommodate the new needs and requirements resulting from changes within an organisation and its surroundings.

Connecting processes

The processes of *change management* and *software control and distribution* constitute the elements which connect the two clusters of operational processes. Change management represents an inbound route going in the direction of maintenance, while software control and distribution is the equivalent towards maintenance. Change management determines and manages the logistics of change, while software control and distribution is responsible for the logistics of the physical items within an information system.

Tactical processes

The maintenance and enhancement activities need to be managed in terms of time, funds, external and internal quality and preferably in relation to each other. These tactical processes are responsible for the overall direction of the operational processes for both maintenance and enhancement and renovation. The strategic and operational levels feed into the management processes and the latter in turn feed into them. Consequently, both the future and the day-to-day reality are anchored in these processes.

Strategic processes

Applications Cycle Management

Applications Cycle Management (ACM) is a cluster of processes which is responsible for defining long-term strategy for the various applications within an organisation of users or customers in relation to the long-term policy of these organisation. The users organisation is thus at the core of this cluster of processes.

Organisation Cycle Management

Organisation Cycle Management (OCM) is a class of processes that is geared towards the development of an ICT service organisation's vision for the future and its translation into policy on upgrading the organisation's services.

ASL AND CMMI UNDER THE SPOTLIGHT

The question as to when CMMI or ASL offers more added value is one that is certainly relevant to those organisations which are responsible for the release-related maintenance of applications. Yet understanding this is also worthwhile for any other application development and management organisation. A number of aspects in respect of which the two models differ from each other, are therefore highlighted below.

Main features

ASL is geared towards *application management organisations*, which manage, maintain and renovate applications. It covers both ICT service processes in so far as they pertain to applications and application development processes (modified or otherwise). In relation to applications (CMMI-SW), CMMI is geared towards *development organisations*: new development or a project-based approach towards large-scale maintenance or upgrading. Little attention is devoted to ICT service processes, also those intended for applications.

ASL is concerned with the *implementation* of application management, maintenance, enhancement and renovation, its management and the strategic processes through which the future of the applications and the relevant ICT organisation are regularly considered. CMMI is primarily active at the *managerial level* (many quality-related processes) and less so at the operational and strategic levels.

ASL focuses on internal and external concerns at both the operational and strategic levels. CMMI concentrates largely on internal matters. The optional CMMI/IPPD module devotes attention to collaboration mainly with other suppliers and to some extent with customers.

	ASL	CMMI -SW
Key purpose	Tool for structuring and improving processes	Tool for evaluating and improving organisational maturity and the quality of processes
Scope	Maintenance, enhancement and renovation of applications	Development of new applications and upgrading of existing ones
	Geared towards the services level and processes	Geared towards the quality of processes and products
Approach	Uses a framework to present the main features and structures of the processes that are to be set up	Specifies groups of process areas which need to be structured up to the prescribed level (prescriptive)
	Uses best practices to offer practical substance sourced from proven practice	Describes what and not how in a prescribed order (staged) or 'composition' (continuous, categories)
Level	Strategic, tactical and operational processes	Tactical processes
Target group	Senior and middle management	Senior management
Focus	Focuses on internal and external matters	Focuses on internal matters
Availability	Public domain: www.asl.foundation.org	Public domain: http://www.sei.cmu.edu/cmmi
Position	Growing, Netherlands, Belgium and the United Kingdom	CMM is fully developed and enjoys global recognition. CMM is gradually being replaced by CMMI

Table 1 – Comparison of the main features of ASL and CMMI -SW

Scope and accessibility

CMMI is undoubtedly more accessible than its predecessor, CMM. However, the scope of its basic descriptions has expanded significantly. Its process descriptions increased from approximately 400 to more than 1100 pages, if the staged and continuous versions are considered together (CMMI product team, 2001).

It was decided to confine the basic description of ASL (Van der Pols, 2001) to its main features. The structure of its framework is practical, simple and transparent, thereby rendering it easy to teach. A book of approximately 200 pages and a self-assessment of about 40 pages constitute the basis for the determination of a strategy for improvement.

CMMI and service management

One aspect of criticism directed at CMM (Sassenburg, 2002) was that this model did not offer a framework and substance for the maintenance of applications and other non-development disciplines. Unfortunately, CMMI also fails to cover the life cycle of an application after it has been developed. CMMI says virtually nothing about the transition to maintenance and does not deal with the processes and measures that are required in order to manage an application effectively and at a reasonable cost. In addition, CMMI devotes little attention to the conclusion of service level agreements entered into by customers and their suppliers, and the establishment of processes in order to manage them.

Like CMM, CMMI's approach is barely geared towards customers and service. It is highly process-oriented and focuses on the supply of products and not on the provision of services to customers. The processes concentrate mainly on proper management in respect of time, funds and the quality of the products covered by application development. This was reason enough for a number of Dutch organisations to develop 'IT Service CMM' to complement CMM in 1998 (Niessink, 2001). IT Service CMM, SW-CMM and ASL have been compared to each other in a number of articles (Meijer, 2001 and 2002).

Whereas CMM largely confined itself to aspects of quality and maintenance aspects, CMMI covers all operational processes. However, ASL deals with the substantive activities involved in operational processes in greater depth and in more concrete terms than CMMI.

What is remarkable, is that in two thirds (22) of the CMMI process areas attention is devoted to subjects which only relate to two of the 26 ASL processes, planning and control, and predominantly quality management.

The externally focussed strategic ASL processes in the ACM cluster are not covered by CMMI. The latter only covers the OCM processes to a very limited extent.

CMMI places a great deal of emphasis on what ASL refers to as 'the tactical level' and clearly deals with it in greater depth than ASL.

IMPROVING PROCESSES WITH THE AID OF A GROWTH MODEL

Significance and assessment of maturity

ASL is first and foremost a process model and a collection of best practices. A scan and self-evaluation have been developed as by-products within ASL (Deurloo, 2003). They serve as tools to determine where areas for improvement lie within application management organisations. In doing so, ASL provides the substance for its own maturity model. CMMI originally focussed on determining the maturity of application development organisations, amongst other things. Maturity levels and assessments constitute *the foundation* of this model. Table 3 highlights several aspects of the maturity models of ASL and CMMI.

ASL	CMMI
Process maturity	Traditionally deals with <i>organisational</i> maturity (staged)
Processes grow towards maturity	<i>Management of processes</i> grows towards maturity (continuous)
Growth model is a <i>by-product</i>	Growth model is the <i>foundation</i>
Helps improve processes	<i>Dedicated</i> to improving processes
Now defines a formalised assessment based on self-evaluation	Self-evaluation has been developed based on formalised assessments

Table 3 – Comparison of aspects of ASL and CMMI maturity models

In the case of the ASL scan and self-evaluation maturity is first of all determined in relation to each application management process. In the final report it can be translated into an organisation's overall maturity. CMMI assessments traditionally occur in a staged form focussing on the maturity of the entire organisation and are based on the presence of process areas either properly filled in or not. No distinction is drawn between maturity levels within the process areas. In the continuous form of CMMI the capability of each process area is determined. It therefore exhibits greater similarity with the self-evaluation approach of ASL. Complementing the self-evaluation, work is currently ensuing on a certification model within the ASL foundation to make it possible to determine the maturity of an application management organisation as a whole.

The significance of the maturity levels are listed alongside each other in Table 4.

STAGE	Significance of ASL (by ASL process)	Significance of CMMI	CMMI Stage
0. Absent	The process is not acknowledged. There is often no awareness that a process requires substance.	The process is only partly executed or not at all. One or more of the specific process targets is or are not achieved.	0. Incomplete
1. Initial	An application management organisation does not have a stable environment for the purposes of executing the processes in the ASL framework. However, activities are performed within the process area. The initiative is taken and sometimes activities are performed in order to obtain an insight. The results and outcomes of these activities are sometimes unpredictable.	All the specific targets for the relevant process area (PA) are achieved. Input and output comply with the relevant description.	1. Performed / initial
2. Repeated	An organisation performs activities based on repetition. Previous experience and methods are used during execution. A standardised approach begins to evolve. It offers some potential for interim management. The latter occurs on the basis of expectations and outcomes.	The achievements of the process are controlled with the aid of policy, planning, resource scheduling, the allocation of responsibilities, training, monitoring, reviewing, evaluation and the like (as is required to manage a project). Planning occurs and the direction is adjusted in relation to Level 1.	2. Managed
3. Defined and managed	The activities and processes are visible, documented and defined. Attention has been devoted to the manner in which the processes are to occur. In addition, the processes have been structured in such a way that there are quantitative and qualitative key figures based on which an organisation can manage its affairs and change course accordingly. An organisation could also use them to alter its direction.	The process has been standardised for the entire organisation or there is a mechanism which ensures that the process properly addresses specific requirements.	3. Defined
4. Optimised	An organisation is structured in such a manner that there is an ongoing improvement of processes. Mechanisms and processes have been developed to facilitate the constant, managed improvement of the process. Renovates and improvements have been built into the organisation.	Standardised techniques – for example, statistical ones – are used to manage a process throughout its life cycle.	4. Quantitatively managed
5. Chain	When structuring, improving and coordinating its processes, an organisation focuses on increasing its added value within the process chain in which it operates. Its focus, interest and perspective are not merely directed towards the organisation but are situated in the context of its surroundings. An attempt is made to maximise the added value of all the entities within the chain.	The process constantly keeps pace with any change in requirements based on the relevant corporate objectives. The structural causes of process variation are eliminated. This is done in relation to the costs involved and the impact it has on the organisation concerned.	5. Optimising

Table 4 – Comparison of ASL and CMMI-continuous maturity levels

As Table 4 reveals, ASL and CMMI have similar maturity levels at first glance. Yet there is a major difference. Levels 1 to 4 of ASL follow those of CMMI. They provide an insight into the manner in which the processes and the system are defined. CMMI's Levels 3 and 4 have been combined in this respect, although the requirements of ASL do not go as far as those of CMMI with regard to standardisation for an entire organisation. ASL's Level 4 more or less corresponds to CMMI's Level 5. In ASL Level 5 is based on the INK maturity model. The reason for this is that the importance of one's surroundings and chains is increasingly becoming a critical success factor for application management.

Growth model approach

If one examines the process requirements for self-evaluation in ASL and CMMI continuous, there appear to be more differences. Table 5 offers a detailed comparison of the two models based on the configuration management process which is found in both of them. For reasons pertaining to the size of the table Levels 4 and 5 have not been worked out in full.

Level	CONFIGURATION MANAGEMENT IN ASL	CONFIGURATION MANAGEMENT IN CMMI
1	<ul style="list-style-type: none"> • There is a registry (a list) of applications which are maintained. • One has an insight into the locations where the applications are used and the organisations that use them. • It is known what the main points are of the services which the application management organisation provides, and what expectations and duties are current in respect of this management. • There are conventions (informal or otherwise) governing the names used for applications and items. 	<ul style="list-style-type: none"> • Baselines of identified work products are established. The configuration items, components, and related work products that will be placed under configuration management are identified. A configuration management and change management system for controlling work products is established and maintained. Create or release baselines are created or released for internal use and for delivery to the customer. • Configuration items are itemised and are incorporated into configuration management (CM) using a CM system (which may or may not be automated). The modification of any products (operational or otherwise) which have been incorporated into CM, are managed, i.e. registered, monitored and controlled. • Changes to the configuration items are tracked and controlled. Configuration audits are performed to maintain integrity of the configuration baselines.
2	<ul style="list-style-type: none"> • Different versions of applications are identified. The relevant records are correct and up-to-date in the case of important systems. • In the case of more than 95% of the applications, including the important ones, it is known which versions are running on which platforms and with which customers, and there are records of this. • An application management organisation knows what has been agreed in respect of services, it has records of the underlying service items and the relevant agreements are available to the application managers. • There are naming conventions (identification rules) for applications and their processing, and they are generally used (more than 98%). 	<ul style="list-style-type: none"> • An organisation establishes and maintains policy for planning and performing the CM process. • It assigns responsibility and authority for performing the process, developing the work products, and providing the services of the process. It provides adequate resources for performing the CM process, developing the work products, and providing the services of the process. It trains the people performing or supporting the process as needed. It places designated work products of the process under appropriate levels of configuration management. • The CM manager monitors and controls the CM process against the plan for performing the CM process and takes appropriate corrective action. He verifies that the CM process is executed in accordance with the relevant standards, guidelines and procedures. He objectively evaluates adherence of the process against its process description, standards, and procedures, and addresses noncompliance. • The CM manager reviews the activities, status, and results of the process with higher level management and resolves issues.
3	<ul style="list-style-type: none"> • Records are made of the various versions of applications that are running and the platforms on which this occurs. The features of these platforms are registered or are deducible. • It is possible to deduce from these versions in what manner they have been built using application objects (programs and so forth), and which versions of the latter were involved. • This CM database is up-to-date. There is a process to insure that this information is up-to-date. • The services and underlying service items are 	<ul style="list-style-type: none"> • The CM manager establishes and maintains the description of a standard (defined) CM process • The CM manager collects work products, measures, measurement results, and improvement information derived from planning and performing the process to support the future use and improvement of the organization's processes and process assets.

Level	CONFIGURATION MANAGEMENT IN ASL	CONFIGURATION MANAGEMENT IN CMMI
	<ul style="list-style-type: none"> recorded, are up-to-date and are known. Naming conventions have been drawn up and are used for verification purposes. 	
4	<ul style="list-style-type: none"> The configuration management process and arrangements pertaining to other processes are periodically (at least once every two to three years) evaluated and improved. Identification rules (naming conventions) for application items are proactively maintained. 	<ul style="list-style-type: none"> The CM manager establishes and maintains quantitative objectives for the process that address quality and process performance based on customer needs and business objectives.
5	<ul style="list-style-type: none"> If there are applications in a chain, configuration management occurs in an integrated manner involving the various organisations. 	<ul style="list-style-type: none"> The CM manager ensures continuous improvement of the process in fulfilling the relevant business objectives of the organization.

Table 5 – Maturity criteria for the configuration management process in the case of ASL and CMMI

The example in Table 5 reveals that the vantage point for examining the maturity of a process differs in the cases of CMMI and ASL self-evaluation. At all levels ASL examines the nature of the activities involved in a specific process, whereas CMMI actually only provides the specific substance for activities pertaining to the one process area at Level 1. The requirements which CMMI stipulates for the higher capability levels, are generic in relation to all the processes, such as defining policy, training staff and drawing up standard process descriptions.

This means that performing an assessment based on ASL or CMMI will produce *different* information about the relevant process:

- CMMI mainly provides information about the control of the process;
- ASL is more inclined to translate the requirements for the activities that need to be performed within the process, into practice and to do so in more concrete terms.

At the substantive level one also notices that the CMMI configuration management process includes elements of that of ASL (change requests, amongst other things).

CMMI thus focuses closely on organisational improvements at the supervisory management level by prescribing a fixed series of additions to the various processes at every CMMI level. The ASL levels are filled in more concretely and provide input for the improvement of day-to-day work at both the supervisory and operational levels.

Mandatory and optional routes for the use of ASL and CMMI

Where the initiative is taken to improve matters in ICT organisations, it is often directed at eliminating one or more trouble spots. A more or less isolated problem area can be tackled in a focused manner, which usually makes it possible to remedy it promptly. The situation is different where one needs to set more wide-ranging targets, such as professionalising an ICT organisation, reducing costs or improving ICT services. In such instances an organisation soon has to contend with many substantially different areas requiring attention.

Separately tackling points for improvement, which can sometimes number more than 100, can result in suboptimum performance, if the various subsidiary solutions do not fit in well with each other. In addition, it appears to be difficult to plan and coordinate individual actions and improvement projects. There is a chance that today's solution will produce tomorrow's problem. For this reason CMMI's predecessor followed a fixed phased route comprising five consecutive logical maturity levels (staged). When moving to a higher level, the focus was always directed towards a predefined category of areas requiring attention.

It is precisely because CMMI's predecessor only followed a single one-size-fits-all route ('staged'), that it is often described as rigid (Cannegieter, 2002). After all, should the ICT department of a business active in the chemical industry pursue the same key points (and do so in the same order) as one of similar maturity which is part of a small insurance company or government? In addition, how does the staged form of CMM provide support for the distinctive characteristics of ICT service providers that operate on the basis of operational excellence (off-the-peg, fast and affordable) or precise customer intimacy (tailored, the customer is king and customer relations)?

The continuous form of CMMI together with the latter's modular structure offers considerably greater flexibility than the staged version. As stated above, it is possible to define a 'tailored' growth profile, to schedule it, to implement it and to have it certified. However, this freedom elicits the following question: 'If I wish to improve my processes, where should I start?' If CMMI continuous is used, it is usually recommended to start with the processes of Level 2 in the staged approach and then move on to growth in accordance with the continuous approach. In principle, this means that one should always start with the improvement of activities, such as project planning, monitoring and control, quality assurance and process assessments. Naturally, one may deviate from this in a particular situation but by doing so, one will stray from the standard path towards growth and the security it offers.

In this respect ASL adopts a more nuanced approach and also offers greater scope. Its underlying philosophy is as follows: perform a self-assessment or have a scan conducted of all the processes or some of them (sometimes there is no immediate need to include the strategic processes in an initial scan). Then examine where the lacunae are to be found in relation to the criteria for the self-assessment. Itemise the most important problem areas and commence improvement in them. Sometimes this may involve the incident management process but it could also be service level management, software control and distribution, testing or planning and control. By adopting this approach ASL always ties in directly with the actual business case, because it focuses on the problem areas or goals of a specific organisation.

Using the models

A 'pure' application development organisation will benefit most from CMMI. More than its predecessor, SW-CMM, CMMI makes it possible for such an organisation to tackle the improvement of processes in a tailored fashion and by process area if necessary. However, compared with ASL, one notices that CMMI does not include any service-oriented management processes. In this respect and that of best practices, the pragmatic model that is ASL, clearly offers added value.

An organisation which is involved in the management and/or maintenance of existing applications, will benefit most from ASL in structuring and upgrading its processes. It is possible to determine the maturity of each of its processes (or to have this done) with the aid of an ASL self-assessment. In addition, ASL offers clear pointers for cooperation with application development and other IT management organisations.

As is evident from the analyses referred to in this article, a combination of ASL and CMMI can certainly make sense in several areas. With the focus on the future that is typical of them, the two guiding process areas of ASL complement CMMI. In turn, the latter offers a great deal of support for management in line with the quality of one's development and maintenance operations by yielding more substance for the guiding ASL processes and quality management, and planning and control.

CONCLUSIONS

Any organisation that develops and/or maintains applications, may benefit from the use of two recent models for improvement which are rapidly gaining in popularity: CMMI and ASL. In certain cases it may be more effective to structure and improve such an organisation by using a combination of these two models or part of them.

CMMI-SW is the means of choice if one needs to obtain an idea of the maturity of the processes of an organisation that is solely involved in application development, and to bring management into line with the quality of this development.

The situation is different for application management organisations (and those application development departments which maintain and renovate existing applications). The combination of elements of CMMI and ASL often makes sense when improving maintenance processes. If one requires a rapid snapshot of the maturity of the *management* of maintenance processes, CMMI is a readily usable tool, certainly where one wishes to move from the first to the second stage. An ASL self-assessment devotes more attention to the substantive aspects of maintenance, upgrading and management, thereby providing more pointers for *organizing* the various processes.

If an application management organisation requires concrete pointers for the manner in which its operational and strategic processes may be structured, ASL offers more support owing to its practical structure, the extrapolation of the various processes and the availability of best practices.

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