A 2-dimensional Maturity Model

De- and recomposing traditional maturity models for improved management consultancy

A whitepaper by Andreas Eckert, PhD

Contents

The Need for a Maturity Perspective on Organizational Change

For all topics concerning change, a clear idea of a desirable future state is important, not the least to know what to look out for in terms of where you are starting from. Organizations are looking towards management consultancies to help them define and achieve organizational goals, often through a series of change processes, be they organizational, procedural, or technological. The concept of Organizational Maturity is used in the management consulting arena to define a vision of what it is that is desirable and what to look out for to understand where you currently are as an organization.

At the center of most maturity models is the concept of several stages or steps to "climb" towards higher maturity. One of the most-applied and most well-founded maturity models is the Capability Maturity Model Integration (CMMI) by Carnegie Mellon University. Originally created for software development, CMMI has been used to guide process improvement across projects, divisions, or an entire organization. CMMI is extremely detailed, engineered towards analyzing, understanding and maturing organizational processes to achieve desirable outcomes.

However, these models carry a fundamental assumption that has – to our knowledge – not been challenged, yet: 1-dimensionality. In short, advancing in maturity as per these models happens by mastering certain steps in a linear fashion, starting from a rather unstructured, "everyone does as good as they can" stage through some standardization and integration levels towards the capability of managing business processes using metrics and optimizing processes and business outcomes by improving on such metrics. In essence, the models claim that to achieve high maturity requires first some steps of standardization or integration before optimization can effectively be brought forward.

We propose a maturity concept that is new in both its theoretical foundation and practical application. Our goal is to provide consultancies with a tool that encompasses the often more revolutionary than evolutionary realities of organizational change. The model builds on the principles of existing organizational maturity concepts such as the CMMI but proposes 2 dimensions for maturity growth: standardization and utilization. Using these two dimensions, organizations can analyze and plan how to build maturity within their organizational set up, or reality, respectively. The fundamental idea is that processes, practices and activities can be used to steer based on metrics and optimize business processes and outcomes independently of the level of standardization of such processes. However, the higher the level of standardization achieved, the higher the added value that can be gained by utilizing processes, activities and practices for purposes of quantitative steering and business optimization.

To acknowledge that the concept of 5-steps of maturity is already well introduced, it also provides a mathematical algorithm to transform assessments on these two dimensions back to a 5-point maturity scale (e.g. as per CMMI) to allow for easy communication using an already well established maturity concept, albeit safeguarding the fundamental relationship of the two dimensions.

Finally, we suggest four areas to assess maturity in in a change process: People, Process, Culture and Infrastructure. Survey questions are proposed to help with establishing the current status of an organization in these 4 areas, and the results are combined into a maturity measure. The new maturity model allows for deciding on the best next move in the change process considering the strategic goals connected with the change program: Should we further standardize our processes and practices or concentrate our efforts on steering and optimizing in a particular focus area crucial for the success of our strategy?

Hence, our proposed model can be used to conceptualize organizational maturity, as an empirical approach to assessing a current maturity status, and a prescriptive model for change consultancy.

The Assumption of Linearity and 1-Dimensionality in existing Maturity Models

Most maturity models propose a linear series of steps towards achieving high maturity. The best established and elaborated model is by far the Capability Maturity Model Integration (CMMI), originally introduced by Carnegie Mellon University. This model defines maturity levels for processes as (1) Initial, (2) Managed, (3) Defined, (4) Quantitatively Managed, and (5) Optimizing.

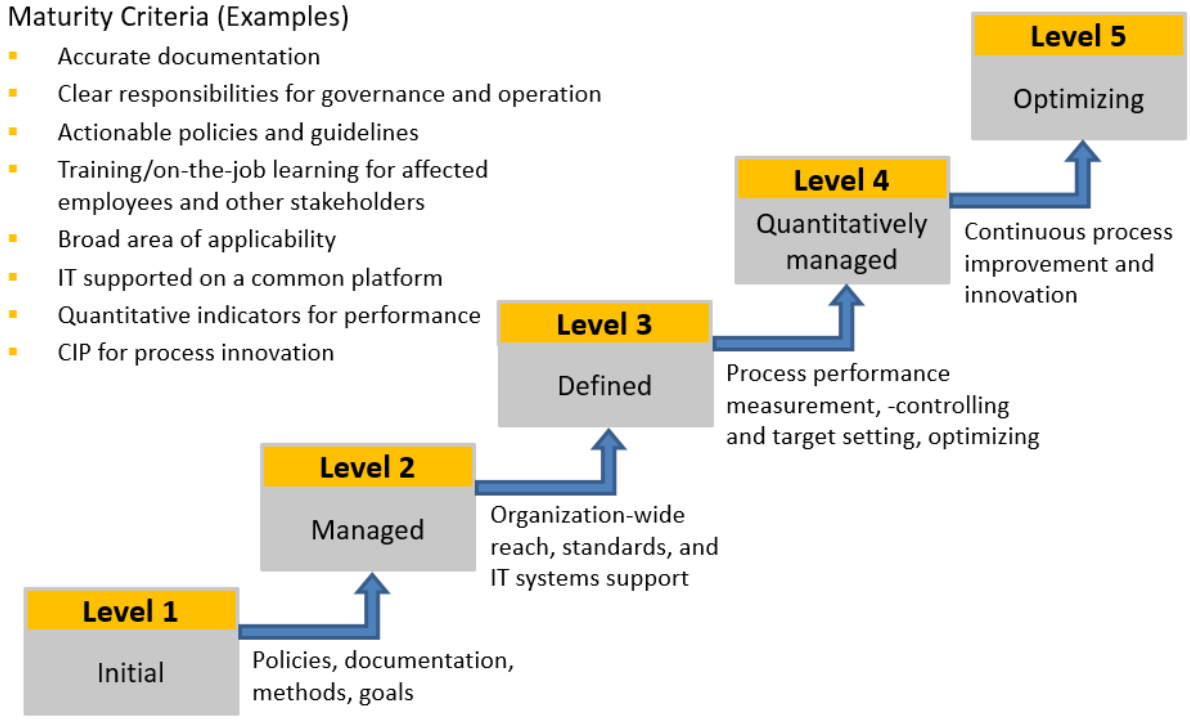

Fig. 1: A Maturity Model (Capability Maturity Model Integration CMMI (Godfrey, S. 2008))

CMMI has been generalized over the years, originally built for software engineering to now span other areas, such as the delivery of all kinds of services and the acquisition of products and services, etc. However, this whitepaper is not a review of CMMI. It is about an underlying principle that can also be found in seemingly unrelated maturity models. In simple terms:

“First get your act together, then act, measure your achievements, then you can optimize your act.”

An internet image search about maturity models will return a high number of models. Some models might show less or more than 5 steps. Irrespective of the number of steps, most models share the same underlying principle: Standardize and integrate practices and processes first, then you can manage and optimize them effectively. The interested reader is encouraged to check our claim of 1-dimensionality against examples of their search results.

The Issue with only one Dimension and linear Steps

Looking closer at such models, they carry an inherent assumption: Maturity is conceptualized in a linear series of steps (often but not always 5). Each higher step builds on the full achievement of all requirements posed by the respective lower step(s). Hence, higher maturity levels can only be attained by achieving the requirements of the steps below.

For example, level 2 must be achieved with all processes before you can claim you have reached level 3. The authors of the models realize that organizations often seek to advance with some process areas to a higher maturity level than with other process areas. That way, they try to bootstrap the maturity level of the overall organization to a higher level. However, CMMI warns explicitly that “In

such situations, however, organizations should understand that the success of these improvements is at risk because the foundation for their successful institutionalization has not been completed". (CMMI for Services, 2010, p. 30). In other words: Possible but not recommended.

For a management consultant, this raises an important question: How realistic is an approach that requires to first standardize all process areas across an organization on a certain level, say level 2, before continuing to take steps to perform on level 3? And: Is it likely to be the most successful way to change the organization towards the reality of what stakeholders (often the sponsors) want to and are able achieve? Especially when seen in the light of accelerating change and agility requirements?

Maybe, first excelling in some process areas even up to a high maturity level, say level 4 can create best practice and momentum for other areas to follow suite. Or to focus on those areas of the business where I am striving for high maturity for the overall good of the organization, and leave other less strategic areas be at the time being?

This approach, though conceptually less satisfying, is probably the rule rather than the exception. Some higher-level utilization of process areas and data in some areas, though still not being on a high level of integration or standardization across areas. Or maybe even within such areas.

The authors of CMMI appreciate this fact. They conceptualize in the maturity model the fact that an organization can be on different steps of the model with different process areas at the same time. This is done by differentiating between "capabilities" and "maturity levels". "Capabilities" are applicable to singular process areas (capabilities ranging from "incomplete" to "defined"). "Maturity levels", in contrast, concern the overall process landscape and range from "Initial" to "Optimizing" (as described above).

To tie together improvements in capabilities of individual process areas and the maturity levels in the overall process landscape, CMMI suggests rules such as (CMMI for Services, 2010, page 37):

"To achieve maturity level 2, all process areas assigned to maturity level 2 must achieve capability level 2 or 3"

"To achieve maturity level 3, all process areas assigned to maturity levels 2 and 3 must achieve capability level 3" etc.

Summarizing: "… you attain high maturity when you achieve maturity level 4 or 5, Achieving maturity level 4 involves implementing all process areas for maturity levels 2, 3, and 4. Likewise, achieving maturity level 5 involves implementing all process areas for maturity levels 2, 3, 4 and 5." (CMMI for Services, 2010, page 38).

Explaining the full set of rules defined by CMMI goes beyond the scope of this whitepaper. The interested reader is recommended the CMMI pool of resources for more in depth reading (CMMI for Services, 2010).

For this paper, we want to focus on a conceptual "hiccup" in these models, which usually can be placed between steps 3 and 4 of maturity. We claim that the lower steps (in CMMI levels 1-3) conceptually define levels of **standardization**, whereas higher steps (levels 4 and 5 in CMMI) present levels of **utilization** of processes to yield more optimal results. We also claim that though it is likely that optimizing on highly standardized and governed processes will support effective process utilization and yield better results for the overall organization. However, this these two aspects don't **necessarily** build on each other in a deterministic way as suggested in many maturity models. Fig. 2 depicts this switch in dimensions.

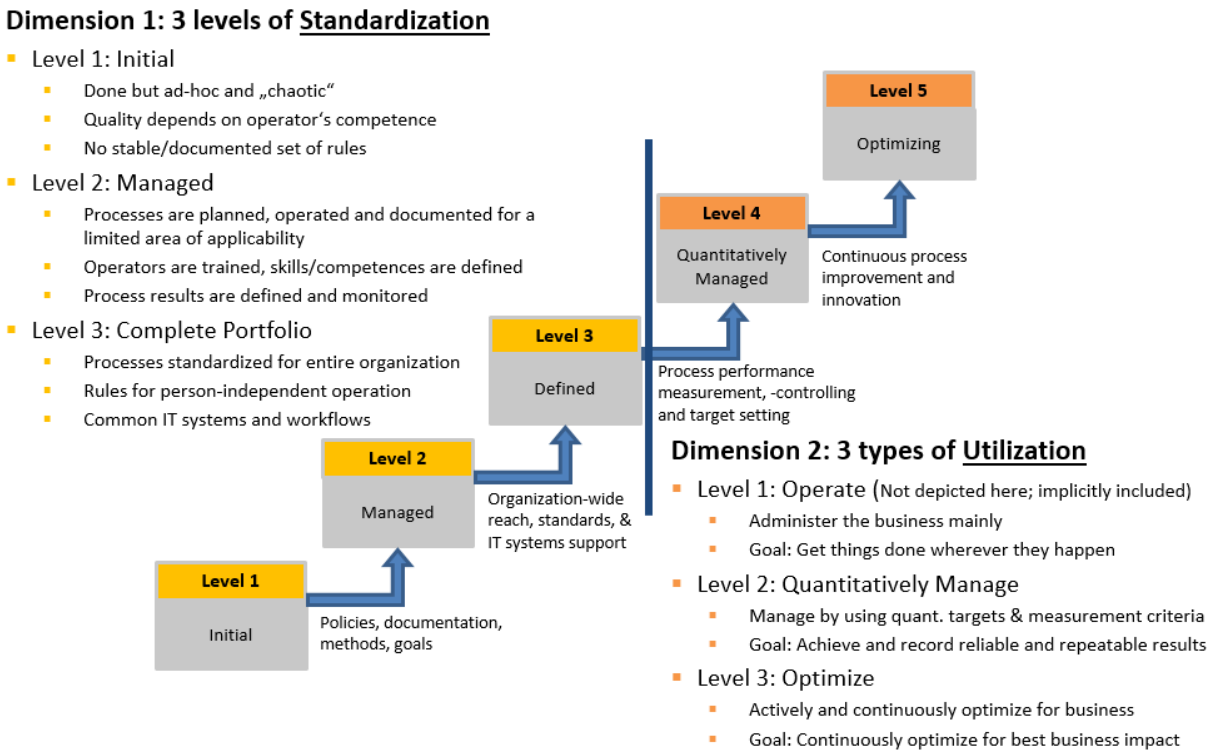

Fig. 2: Two dimensions of maturity

In other words, we claim that determining maturity requires one dimension of **standardization** and a second dimension of **utilization**.

Applying such two-dimensional model is not only theoretically indicated but also more relevant for management advisory in practice: Organizations' power structures are usually not set up to allow one centralized approach to standardizing and integrating all process areas across the organization before the requirement of showing business value by harvesting the fruit of utilizing processes in a strategically desirable way becomes virulent.

Proposal: A 2-dimensional Maturity Model

Two Dimensions of Maturity: Standardization and Utilization

The fundamental innovation of our model is that maturity should be measured on two dimensions: **standardization** and **utilization**. The relationship between the two dimensions is, very simply put, as follows: The more standardized processes are across an organization, the more effectively they can be utilized for achieving strategic organizational objectives.

It is albeit fully possible in the model that non-standardized, disintegrated processes can be utilized to achieve such objectives as well. Albeit usually with much higher effort and risk of failure. But still, it's possible, and it is often the reality of how progress is achieved. And it can be a practical way towards change using best practices by "show me, don't tell me". Hence, there are two dimensions for maturity: The more standardized processes are, the more can be gained by using the processes for strategic aims.

Levels of Standardization

To allow for sufficient differentiation, our model suggests that standardization involve 4 levels:

1. **Individual**: The process, practice or activity is performed on an individual level, i.e. where and when it is needed. There is no broader standardization across organizational entities, such as departments, plants or regions. Every entity might have variants of the same process

to do similar things but there is no overarching standard or policy to do things the same way. Documentation is either only available for individual operators or not documented at all. Often, documented processes are altered on an individual, ad hoc-level using individual styles of doing things, or work arounds to "make things work".

2. **In smaller group(s)**: There is a certain level of standardization of a process, activity or practice in an organizational entity. But it is limited to smaller groups, like teams, departments, practice group or similar. Usually, there is some level of documentation and policy for that is applicable and monitored for this group. For core processes, owners or "carers" might be identified who maintain documentation and can act as support for others using the processes, applying the practices etc.
3. **In bigger group(s)**: Standardization of processes, practices or activities goes beyond smaller groups in the organization towards divisions, countries, regions, or business units. Corporate teams or communities of practice are set up to maintain processes and monitor and report on their application. Corporate IT systems play an ever-increasing role in making such application in larger groups possible in a managed and efficient manner. Often, such constellations can be observed in companies that went through mergers and acquisitions and are, after a phase of business continuation and stabilization, entering an organizational consolidation phase.
4. **Across the organization**: Processes, practices and activities are applied across the organization in a standardized way. Usually, corporate policies and process management teams and solutions are in place to maintain sets of rules and standards and manage them over time.

Using four levels of standardization should allow for sufficient differentiation of breadth of standardization across an enterprise. Practically, there will be a bigger effort to move from level 3 to 4 of standardization because often this requires greater steering by corporate headquarter functions and hence an organizational design strategy that most companies in our experience find hard to achieve or sometimes don't consider matching to company culture. Please note, though, that level 4 standardization does not necessarily mean that there is a centralized steering model in place. Standardization can also be achieved through consensus in, for example, process-area oriented communities of practice, albeit such communities usually will find it harder to get to a consensus about what to standardize and to which level.

In practice, in most corporate functions there will be a mixture of process standardization across these levels. There will be some processes, practices or activities in an organizational function that are applied organization-wide (level 4), e.g. particularly business or reporting relevant processes in financial consolidation or HR corporate compliance. In addition, many other processes in the same function will commonly applied only in smaller groups (level 2). It is part of the design of a maturity analysis project to decide how to deal with such variations. On an individual process level, the model can be applied as fine-grained as required. On a function, or process area level, our recommendation is to look into all processes, practices, and activities in question and average out the respective standardization level, e.g. using median or mean. In many cases, weighing processes according to their importance for overall organizational performance and maturity should be considered to get a more practically relevant result for planning organizational change priorities in a later step.

Types of Utilization

Utilization of processes, practices and activities refers to the "why" and "what for" of maturity. Even if a process is standardized on an organization-wide level (level 4 standardization) it could still be used merely to operate the topic, making the process largely administrative in nature. On the other hand, even an individually applied, non-standardized process can be used to optimize business,

though often tied to individuals putting in their effort and power to execute on a higher utilization level, or if organizational decision and execution structures allow for such individual contribution and are tolerant of risk of failure.

The model suggests three types of Utilization:

1. **Operate**: The process, practice or activity is performed to operationally perform the respective tasks and achieve the defined outcomes. Achieving outcomes in a reliable fashion and stability in operation are the most important criteria.
2. **Quantitatively Manage**: Managing processes, practices or activities involves ownership, accountability, monitorability and measurability of performance. The aim is to achieve efficiencies, repeatability, predictability and therefore risk management. Metrics are used for reporting, inform steering decisions and allow for identifying areas of improvement. In practice, some processes practices and activities might be managed without the consistent use of metrics, such as process or performance indicators. The less metrics are used, the less measurable, and as commonly suggested, the less manageable these topics will be. It needs to be defined in the design phase of a maturity analysis project whether non-quantitatively managed processes should be regarded as utilization type 1 or 2. It is also possible (see below) to put in a separation between managed and quantitatively managed if required.
3. **Optimize**: The outputs of processes, practices and activities are used to make decisions regarding the optimization of overall organizational performance. Shortfalls and gaps in performance are detected and used to drive a continuous optimization strategy. Also, the impact of decisions can in turn be readily monitored through analyses of the metrics fed by processes, practices and activities. Outputs from different corporate functions are combined to decide on business strategies in a concerted fashion. This utilization type requires metrics (utilization type 2) to measure and combine process, practice or activity outcomes.

It is possible to extend the maturity model by breaking a type of utilization into two types, for example type 2 in one type “managed (but not quantitatively)” and “quantitatively managed (using metrics)” as suggested by the CMMI. Interested readers wanting to apply this option only would need to apply same differentiation in scoring the analysis results (see below) accordingly.

Four Areas of Maturity: People, Processes, Culture and Infrastructure

Also, we claim that to assess an organization’s maturity, only looking at business processes is insufficient. If as an organization you are very much process-driven, this might be your most important area to strive for maturity in. However, there is more to maturity for most organizations. We suggest an organization look into processes, activities, practices, tools etc. in four areas, or clusters of maturity: People (PE), Processes (PR), Culture (CU) and Infrastructure (IN).

These four clusters can be areas of priority to organizations, and they can be used in concert to drive maturity from different angles. To assess each of the four clusters on both dimensions of maturity, survey questions about levels of standardization and types of utilization can be used. They can quantify an organization’s maturity level in each of these clusters, either to generate a differentiated view on maturity in each cluster. Or taken together as a single assessment for the organization. (see also Davis, J., Miller, G.J. & Russell, A., 2006).

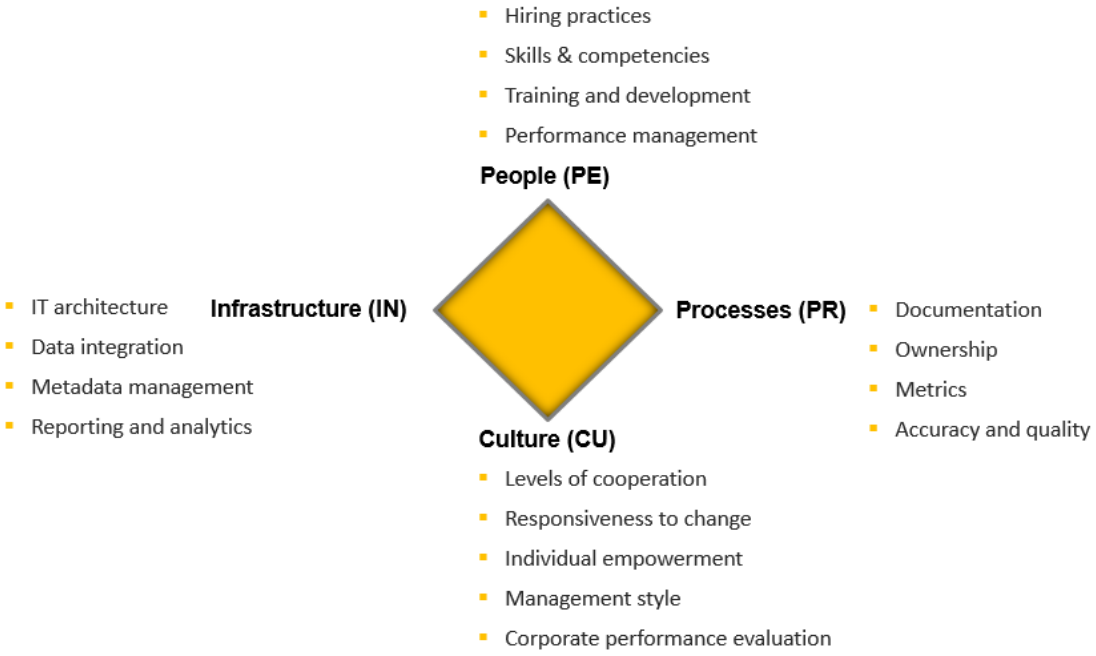

Fig. 3: Four areas to measure maturity for

Data Collection using Survey or Interview

Commonly, process maturity analyses use surveys and/or interviews with stakeholders in the functional and process areas in question to gather the base data. The proposed model is not limited to a certain functional area (e.g. Sales, Finance, Marketing or HR), hence survey or interview items would be written specifically towards these different applications areas. As a common practice, items should be written in a way to first ask for the level of standardization of a process, practice or activity, and then to capture the predominant type of usage of the same.

The table below lists some exemplary survey questions adapted to our model from SAP SE's survey: "The future of HR – Understanding your HR Digital Maturity". To make it as concrete as possible, we choose Human Resources as the functional area to assess maturity for in this example. We also chose this example because digital transformation of business processes, currently performed in many organizations' HR functions, is a major means towards standardization of processes on a global scale. In other words, digitalization advances process standardization across organizations, thereby greatly advancing organizational maturity on dimension "S" in our model.

Please note that each standardization question is linked to a type of utilization question, hence returning scores on both dimensions of the model for each topic. Using this pattern a full survey can be compiled for the particular area of maturity assessment in question – ideally together with the customer.

Cluster	Level of Standardization Questions	Type of Utilization Questions
Answer options:	*1: Individually, here and there* *2: Standardized in smaller groups, such as departments* *3: Standardized in bigger groups, e.g. divisions or countries* *4: Standardized across the organization*	*1: Focus is on performing the activity to reliably achieve the intended outcome* *2: Focus is on managing and improving the activity, e.g. using ownership, rules and metrics* *3: Focus is on optimizing the activity's impact on overall business performance*
PE	HR works with business leaders during the business planning process to identify future workforce requirements (e.g., numbers, skills, location)	Currently, the focus of such collaboration is predominantly on…
PR	The organization has adopted continuous performance feedback, coaching processes and tools to engage talent	Currently, the focus of such activities is predominantly on…
CU	The organization drives a culture of innovation and agility supported by fast and agile innovation methodologies	Currently, such measures are predominantly used with a focus on…
IN	The organization provides social collaboration technology enabling communication across employees, customers and partners	Currently, such software is predominantly used with a focus on…

Table 1: Examples of assessment questions in the 4 areas of maturity on both maturity dimensions. Items are based on SAP SE's survey: "The future of HR – Understanding your HR Digital Maturity"

Scoring Maturity Survey or Interview Results

We recommend the below scheme for scoring results, since it will allow to calculate two scores per question – one per each maturity dimension. Also, we propose a formula for using the utilization score as a weight to apply to the standardization score, thereby combining the scores back to one maturity score between 1 and 5 (as originally introduced by CMMI and many other maturity models). We feel that this will greatly help communicating maturity analysis results to a greater audience who will probably be used to looking at maturity from the point of view of models like the CMMI.

For analysis on both dimensions and on the four clusters of maturity, we suggest simple scoring as 1-4 (standardization) and 1-3 (utilization), so that statistics as means or medians can be used, depending on sample size and distribution characteristics. Also, means and medians can be used to combine overall maturity across the four maturity clusters.

Combining individual dimensional Measures into a 5-Point Maturity Score

In the "maturity practice" of management consultancy, a 5-step maturity approach is something like a norm. Well-introduced in the business world, people usually intuitively understand what "maturity level 3" or similar means. Hence, our maturity model also allows for a calculation of a maturity value between 1 and 5, where higher numbers refer to higher levels of maturity.

The logic for combining scores from both dimensions is as follows: Even with non- or not fully standardized measures, activities, technologies and processes, you can be effective in utilizing these measures on a higher level, i.e. optimizing towards maximum impact on business results (optimize).

However, the "value lift" that can be achieved by moving from operate to quantitatively manage to optimize will be the higher, the higher the level of standardization such utilization is performed on is.

Representing this logic numerically, our model proposes a mathematical formula to tie levels of achievements on both dimensions (standardization and utilization) together into one score between 1 (low) and 5 (high) on a curvilinear maturity function. First, we perform a simple transposition of the survey scores as follows:

Dimension "Standardization"	Original Score	Transposed Score
Individual	1	1
In smaller groups	2	1,7
In bigger groups	3	2,3
Across the organization	4	3
Dimension "Utilization"	**Original Score**	**Transposed Score**
Operate	1	.25
Quantitatively Manage	2	.375
Optimize	3	.50

Table 2: Mapping values to use for a 5-point maturity scale.

It is possible to break individual levels down further, thereby looking at both dimensions in a more granular way. If the interested reader considers doing so, for the formula to return a value between 1 and 5 it is necessary that the scores for all levels be kept between the boundaries set by the lowest and highest transposed score above. The Maturity Formula returns a value between 1 and 5:

$$M = U * (S^2 - 1) + 1$$

Where:

- "M" is the level of maturity
- "S" is the achieved level of standardization
- "U" is the type of utilization, which in this formula is applied as a weight for levels of "S"

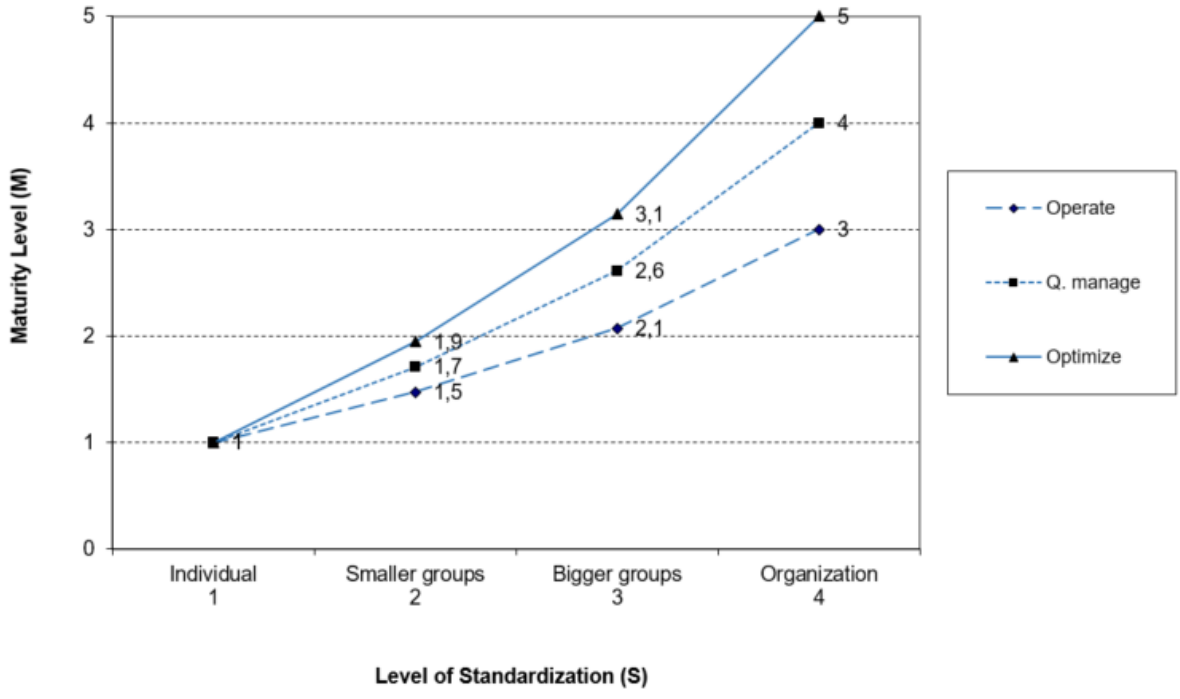

Fig. 4: Maturity Level M as a function of Standardization and Utilization scores

Mapped to a 5-point maturity scale the maturity (M) of a given process, practice or activity shows a curvilinear function for different types of utilization (U) applied as weights to the levels of standardization (S). The following graph depicts a visual representation of the "value lift" that can be achieved by maturing on both dimensions, S and U.

The following graph shows all possible values of M as a function of S and U in a three-dimensional representation.

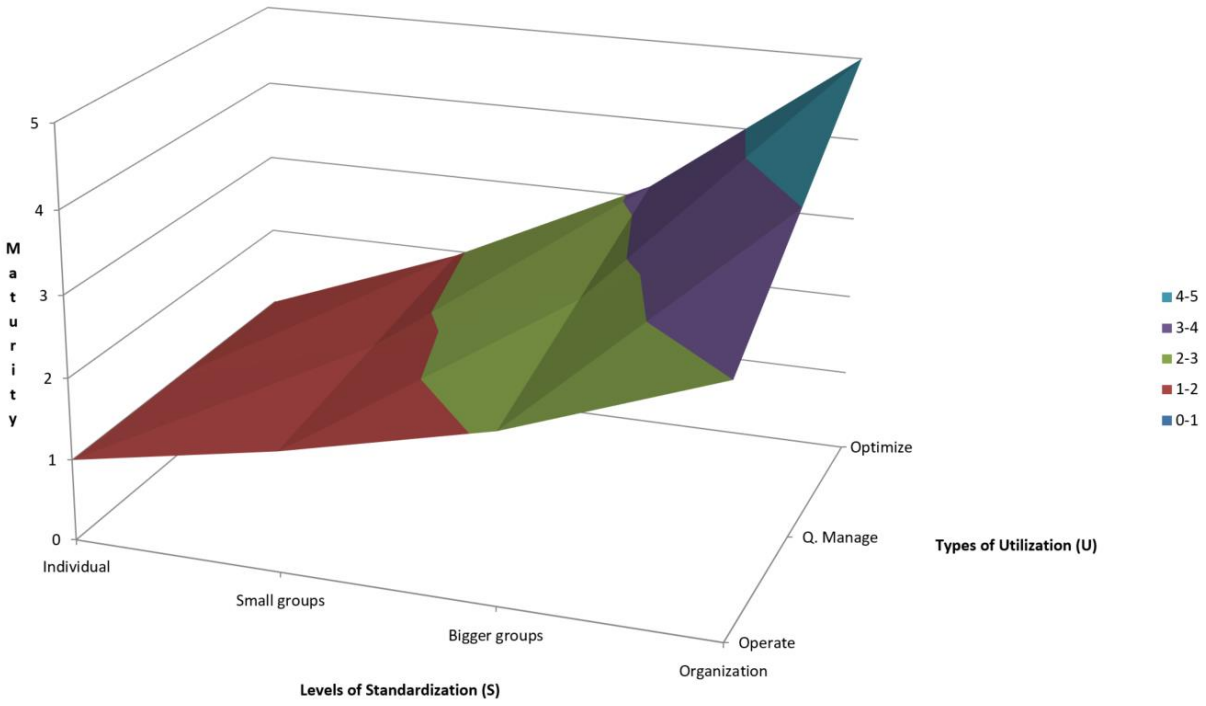

Fig. 5: All possible values of Maturity Level M in a three-dimensional representation

The consulting-oriented purpose of the M formula and its core message is: The more standardized processes and activities are in areas of people, process, organizational culture and infrastructure, the higher the value that can be gained from utilizing such processes and activities to achieve goals in business management and optimization.

Our model can also readily inform considerations regarding an optimal path to value: If an organization has a good grip on a certain process area or department's processes, they can try to quantitatively manage them using metrics, thereby showing measurable results like cost or productivity. A best practice for other process areas, these successes can be used to convince stakeholders for change ideas. When considering the next step on the value path, standardization in other, proximal process areas might be most promising for highest value add. In other words, efforts and resources would be used on broadening standardization than optimizing further in the original process area. And the model will show that a higher value lift would be yielded by such an approach.

In consulting practice, we often see that processes are well integrated in a certain area or region of the business. People are aligned, have clear responsibilities. There is a culture of achieving excellence based on data and insight, and IT solutions yield process efficiencies. These groups put a lot of effort into increasing their maturity in the 4 clusters of maturity, using all kinds of measures and activities top down and bottom up. However, on an organization-wide scale, a bigger bang for the buck could

be achieved by first standardizing best practices processes and approaches across bigger groups, or the entire enterprise (e.g. across functions or regions), simply because a wider application will multiply impact on a larger scale, a broader data base will inform more and better business decisions, steerability and measurability increases deploying measures through standardized processes etc. The accelerated digital transformation of business processes using new technologies like mobile employee and customer self-service, cloud solutions, artificial intelligence, machine learning, the internet of things etc. supports maturing on levels of standardization, thus providing a leapfrog mechanism to lifting value from applying more mature types of utilization.

In summary: The value lift that can be achieved by levels of "U" on maturity "M" will be the higher, the better and more broadly standardized on dimension "S" the underlying processes and activities are, and the current developments in digital transformation can pave the way.

Summary

Using the proposed model, organizations have the opportunity to understand and manage organizational maturity on two dimensions: standardization and utilization. This allows for a more fine-tuned and iterative, step-wise, and digestible approach to organizational maturity. Also, considering four clusters of maturity – people, process, culture and infrastructure – allows for a well-balanced approach to maturity that works the different angles relevant for organizational change. Finally, using the curvilinear nature of the proposed maturity model, the intuitive understanding that investments into a solid, standardized, and integrated foundation for processes, practices and activities across the organization will yield an exponential mid-term return becomes more conceptually sound. Still, applying the maturity formula proposed for our model facilitates understanding of the basic maturity concept by any person – be they more or less involved in the process- as a simple point value between 1 (low) and 5 (high). Therefore, the model can be readily applied for organizations who already adopted traditional capability maturity models.

References

CMMI® for Services, Version1.3. Improving processes for providing better services. The CMMI Product Team. Carnegie Mellon: 2010. (https://www.sei.cmu.edu/reports/10tr034.pdf)

Davis, J., Miller, G.J. & Russell, A. Information Revolution: Using the Information Evolution Model to Grow your Business. John Wiley & Sons: 2006.

SAP SE. Survey: The Future of HR – Understanding Your HR Digital Maturity. Available for subscribers on https://valuemanagement.sap.com

Bio

Dr. Andreas Eckert is a Senior HR Value Advisor with SAP SuccessFactors. He supports customers in progressing their digital HR transformation agendas and building commercial justifications for the change.

Andreas has 20 years of experience in planning and implementing HR change programs. Prior to SAP, he ran his own HR consulting company for 10 years, working with companies in a range of industry sectors and regions.

Andreas holds a PhD in educational psychology. His thesis focuses on the computer-based assessment of knowledge structures and learning processes.

Contact:

Dr. Andreas Eckert

SAP Deutschland SE & Co KG
Hasso-Plattner-Ring 7
69190 Walldorf
Germany