

Foresight Maturity Model (FMM): Achieving Best Practices in the Foresight Field

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Abstract

This paper offers an approach to address the absence of a measurement system for the futures / foresight discipline. The measurement system, based on a successful model used for other complex disciplines, provides a developmental approach for foresight practices. The Foresight Maturity Model (FMM) defines best practices for the foresight field and measures the competency of those practices. It's intended to support practitioners as well as consumers of foresight services.

Keywords: foresight, measurement, practices, taxonomy, improvement

Introduction

Measurement is a foundational component of scientific enquiry, providing an objective framework or structure for contributing to the body of human knowledge. Without this framework, there would be no way to objectively describe the world around us, let alone a means for comparing and monitoring change within it. Some things are relatively easy to measure, like ingredients for recipes, the physical dimensions of a person, or the temperature of a room; while other things, such as a ball player's skill or a beautiful sunset, seem to defy measurement. So measuring complex and intangible items is quite a challenge, and measuring the right aspects of those items is especially critical.

Currently we have no generally accepted measurement system in the practice of foresight. Practitioners will tell you that it is difficult to evaluate futures work because the results are too far out in the future, that there are variables that cannot be controlled and that often the result of good futures work is to avoid an undesirable outcome, a "non-event" that often goes unnoticed. Avoiding the issue of measurement, however, leaves us unable to answer key questions about futures work.

What does good futures work look like? How to excel at futures work? What is the level of the current practice so that it can be compared to other enterprises, so changes can be demonstrated over time? A good measurement system also adds credibility to a field. It defines, assesses and recognizes best practices. It also provides guidance to those purchasing professional services. So the foresight community needs a system to define and regularly evaluate its practice in order to move forward as a respected profession.

Computer science is similar to the futures field in many ways. Large software systems are complex; and through the course of their development, many variables that lead to quality cannot be controlled. Many new systems are developed using unknown and untested approaches. Like futures work, there is often significant investment and some risk associated with the development of a program without knowing if it is going to work. And how does a buyer know whom to choose and how to monitor the work to insure the best chance for success?

Capability Maturity Model

In 1986, the U.S. Dept of Defense, working with Carnegie Mellon University, developed the Capability Maturity Model (CMM) (Carnegie Mellon University, 1994). The CMM was conceived by Watts Humphrey and was based on the earlier work of Phil Crosby. The goal was to create an evaluation of software subcontractors based on defined criteria instead of the *ad hoc* and informal methods of the past. The new and novel measurement approach assessed practices and not *outcomes*. The premise was that if developers use practices that have been determined to be "best practices" in their field, the probability that the resulting system or product would have a chance of working would be higher and would reduce the risk of investment in the program overall. The CMM allowed buyers to assess subcontractors *before* a project started and to continue to assess *during* the project¹. Over time, the maturity model approach has become well respected and widely adopted. In fact, Lee Copeland describes 34 different uses of the maturity model in *The Maturity Maturity Model™ (M3): Guidelines for Improving the Maturity Process* (Copeland, 2008). These range from the diverse aspects of software to include People Capability, eGovernment, Usability, Change Proficiency, and Learning Management.

The Capability Maturity Model is part of a class of models known as developmental models. As with Spiral Dynamics or other organic models, the premise for the model is that change and improvement need to "grow" or mature. The goal of the model is to guide process improvement through various stages or levels.

The capability maturity model consists of defined stages and their indicators. Terms can vary across instances of these models, in defining the background for the foresight, we will use these definitions:

- **Disciplines** are the generally large and fairly independent sets of activity that a practitioner would recognize and use. So disciplines are basically the taxonomy of the major activities in a field.
- **Practices** are the actionable and specific activities of a discipline. Practices define what needs to be done in order to execute a discipline. A good practice is

"what" needs to be done, however, not "how" it is to be done, because methodologies for implementing a practice can vary based on topic and environment.

- **Maturity levels** or stages are the different levels at which the practice is executed.
- **Maturity indicators** are the observable indicators that measure at what maturity level a practice is being executive. These are "snapshots" of the practice at that level and not intended to be fully comprehensive

Foresight Maturity Model Framework (FMM)

The author used her experience with maturity models as a software engineer and manager with IBM to develop the Foresight Maturity Model, referred to as the FMM. IBM used the Capability Maturity Model (CMM, now CMMI) to develop the software that was used on the space shuttle and the space station. These systems were based on new and unknown technologies; they required large, early investment, and the company needed to manage risk to produce the best possible outcome. In short, we could not wait until the end to see if the software worked. The strength of this approach in managing and assessing practices was a key component in the success of the program that was recognized as one of the most successful software development programs ever.

Later IBM's Corporate Strategy group was challenged on how IBM could communicate good strategic practices in order to improve its strategy performance. The group used this same approach by developing the Strategy Maturity Model to effectively answer the questions: 1) What is good strategy? 2) How am I doing? 3) How do I get better? (Corporate Strategy Board, 2002).

Understanding the FMM begins with applying the general structure and definitions of CMMI to the practice of foresight. Below are the maturity model constructs in the FMM model.

Disciplines:

The Foresight Maturity Model uses the following six disciplines to define the best practices for foresight field:

1. **Leadership.** Helping organizations to translate foresight into action...on an ongoing basis.
2. **Framing.** Helping the organization identify and solve the right problems.
3. **Scanning.** Helping organizations to understand what's going on in its immediate environment and in the world at large.
4. **Forecasting.** Helping organizations consider a range of future possibilities.
5. **Visioning.** Helping organizations decide what they want in the future.
6. **Planning.** Helping people develop plans, people, skills, and processes that support the organization's vision.

These disciplines are based on the framework outlined in *Thinking about the Future* co-edited by futurists Andy Hines and Dr. Peter Bishop (Hines, 2006). The book is a contribution of 36 leading futurists describing the best practices that they use. The book identifies six practices areas that define the field: 1. Framing; 2. Scanning; 3. Forecasting; 4. Visioning; 5. Planning; and 6. Acting. The author chose to expand Acting and created Leadership as the 6th discipline for the FMM.

Practices:

There are 3 to 5 practices defined for each of the disciplines. The practices for each of the disciplines can be found in the Appendix for this document. The practices are derived from research, from experience as adjunct professor in Studies of the Future, and from consulting with futurists at Social Technologies ("Social Technologies," 2009). Founded in 1999 by futurist Tom Conger, Social Technologies is a global research and consulting firm specializing in the integration of foresight, strategy, and innovation and has extensive experience in foresight projects and practices. Social Technologies supported the work that led to the FMM in its current state.

Maturity Levels:

The basic maturity model contains five (5) maturity levels:

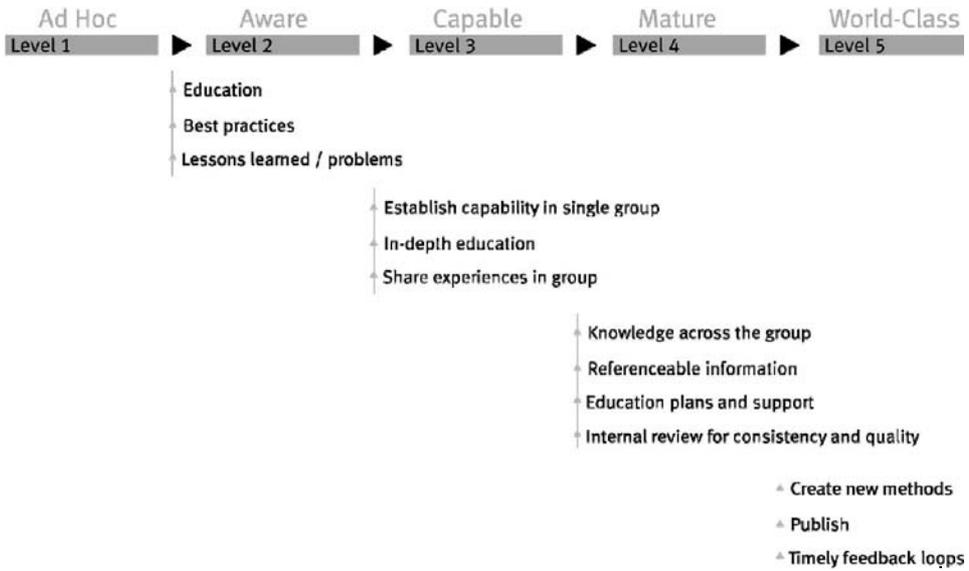
1. **Ad hoc (level 1).** The organization is not or only marginally aware of processes and most work is done without plans or expertise. This is the initial state for any practice.
2. **Aware (level 2).** The organization is aware that there are best practices in the field and is learning from external input and past experiences.
3. **Capable (level 3).** The organization has reached a level where it has a consistent approach for a practice, used across the organization, which delivers an acceptable level of performance and return on investment.
4. **Mature (level 4).** The organization has invested additional resources to develop expertise and advanced processes for a practice.
5. **World-class (level 5).** The organization is considered a leader in this area, often creating and disseminating new methods.

These levels are developmental and cumulative. In other words, organizations can only achieve higher levels after they mastered and passed through the lower levels. As with any developmental process, there is no short cut. If an organization is performing at an *Ad hoc* level, it needs to mature with experience and guidance to grow through the *Aware* level towards the *Capable* level.

Table 1 contains recommendations for how to move from one level to another. For example, one of the best ways to move from *Ad hoc* to *Aware* is through education or lessons learned.

Table 1.

Ways to move from one level to another



Maturity Indicators:

Maturity Indicators are the intersection of the maturity level with the discipline / practice. It gives a brief description of what that practice looks like when performed at that level of maturity.

Figure 1 illustrates this terminology on an example of an FMM Matrix.

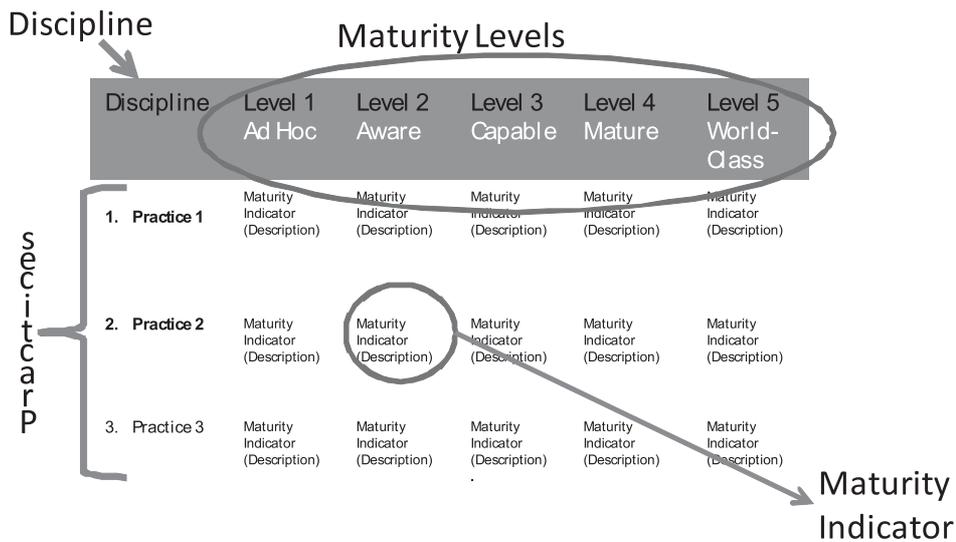


Figure 1. FMM terms illustrated

Using the FMM

There are many uses for maturity models. At the most basic level it is a compilation of best practices aggregated into disciplines for a field. So it is a quick reference and a language for the field. At the next level, it contains snapshots of what a practice looks like as it matures from the "winging it" to "leading the industry," thereby providing an outline of how an organization can effectively build strength and become more effective. And finally, it provides a *numerical* assessment of the maturity of the practices. This number can be used for a variety of purposes: providing an initial assessment, or baseline, for an organization to monitor improvements; providing a means to contrast different organizations; and providing for more informed purchases of services, when the assessment is performed by an independent assessor.

However, every organization need not immediately attempt to become *world class*. For each discipline and for each practice within the discipline, an organization needs to assess how important that practice is to the success of the organization and how much investment should be made. The matrices are designed so that the *capable* level is usually the optimum price / performance point. Below that, *ad hoc* or *aware* level performance does not achieve what is needed for the practice. Above that, *mature* and *world class* levels require investments and should be considered only if it is critical for an organization's success. Figure 2 illustrates how an organization can show the process plan improvements.

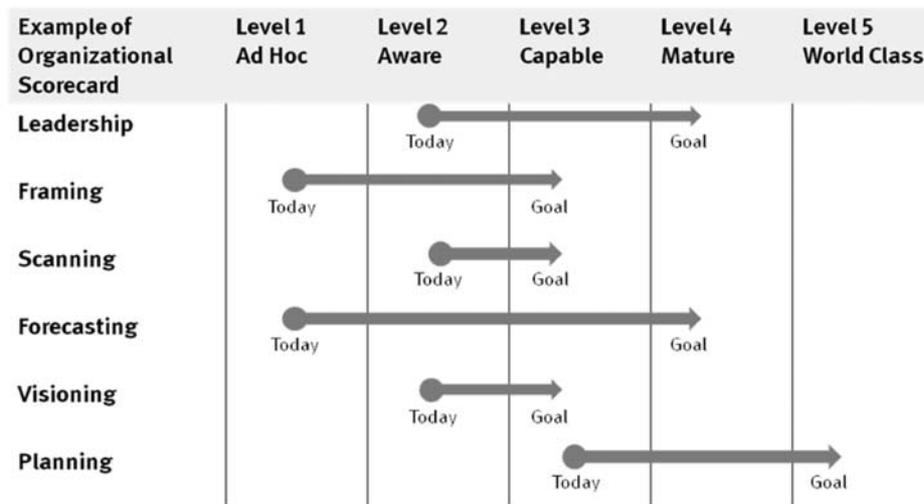


Figure 2. Assessing where you are and what you want to achieve

Calculating Assessment Levels

The way to calculate an organization's numerical score is to assess each practice in a discipline. The level of the lowest level practice is the assessment level for the whole discipline. (It is not the average of the practices). Thus a discipline is only as good as its weakest practice.

An Example

Probably the best way to understand the model is to work with an example. Since scanning is something most futurists quickly identify with, this is the discipline we will use for illustration.

Discipline:

The scanning discipline is defined as follows: Collection of appropriate and relevant information in a format and timeframe that supports useful retrieval.

Practices:

There are five practices for scanning:

1. Map the domain of the system into a framework of areas to explore.
2. Continue to collect pertinent information from a range of diffuse and credible sources.
3. Identify outliers or "outside the system" signals of change that provide insight to possible changes which can impact the system.
4. Integrate external and internal information into a common framework and language.
5. Create a useful and accessible information repository.

Maturity Levels:

The same as any other CMM – *Ad hoc, Aware, Capable, Mature, World Class.*

Maturity Indicators:

Table 2 shows the indicators for the 3rd Scanning practice: *Identify outliers or "outside the system" signals of change that provide insight to possible changes which can impact the system.* You can see how identifying outliers has a better chance of being effective and successful as it progresses through the different maturity levels. Providing perspective, Figure 3 is the scanning matrix. Table 2 is the third row from this matrix.

Table 2.

Indicators of maturity for "Identifying Outliers"
(Scanning Practice #3)

Level 1 Ad hoc	Level 2 Aware	Level 3 Capable	Level 4 Mature	Level 5 World-class
The primary sources for any signals of change come from the media, as they document and discuss potential changes.	High-impact and low-probability events are considered in addition to media spotlights when looking for potential surprises.	There is a process in place to continually review and evaluate trendy or novel occurrences happening in the fringes of society.	Best practices such as ethnographic journeys or wild cards are part of the organization's culture to consistently identify outliers.	Organization has created unique practices in the industry to highlight potential changes including those not related directly to topic.

Figure 1 illustrates the complete scanning matrix and Table 2 can be seen as the 3rd row.

Scanning Maturity Matrix

Scanning	Level 1 Ad Hoc	Level 2 Aware	Level 3 Capable	Level 4 Mature	Level 5 World-Class
1. Map the domain of the system into a framework of areas to explore.	The map is created from those areas directly and explicitly connected to the area of interest.	In addition to the directly connected areas, the map is augmented with other areas "called-out" by the information collected.	A recognized framework (such as STEEP) is used to create a complete map, supporting evaluation of many different facets of the system.	Organizational processes exist to define and build a comprehensive map, exploring domains such as second-order impacts.	An anticipatory map is dynamically changed to provide insightful observations from underlying streams.
2. Continue to collect pertinent information from a range of diffuse and credible sources.	Information is from easily accessible resources commonly used by the project, collected as needed.	Information is collected from traditional resources as well as some from novel sources. Effort is made, when time allows, to do general scanning.	Information is collected routinely from varied sources ranging from the traditional to alternative. Analysts consider information from other domains that could provide insight.	A systematic process collects information from a wide range of resources and media formats on a consistent cycle providing for a comprehensive view of the topic.	Sophisticated methods and tools provide timely and continuous collection of information, allowing visibility on many dimensions with unique views of the topic.
3. Identify outliers or "outside-the-system" signals of change that provide insight to possible changes which can impact the system.	The primary source for any signals of change come from the media, as they document and discuss potential changes.	High-impact and low-probability events are considered in addition to media spotlights when looking for potential surprises.	There is a process in place to continually review and evaluate trendy or novel occurrences happening in the fringes of society.	Best practices such as ethnographic journeys or wild cards are part of the organization's culture to consistently identify outliers.	Organization has created unique practices in the industry to highlight potential changes in those not related directly.
4. Integrate external and internal information into a common framework and language.	Scanned information points are taken as is, with minimal effort to understand and integrate them.	Linkages are informally made and generally within a category, providing a variable view of information.	Connections are made between different categories providing a comprehensive and cohesive view of scanned information.	Universal models provide a powerful world-view framework for deep understanding and an integrative picture of the information collected.	New, innovative, and dynamic models create the organization bring context and insight to diffuse and wide-ranging data points.
5. Create a useful and accessible information repository.	Scanned data is stored in an unstructured and ad hoc manner. Retrieval is generally by the person who collected the information.	An informal process is in place to collect, tag, and store information. Information can be retrieved but may take some time.	Information is tagged and stored in an organization-wide repository providing easy access to retrieve information of interest.	A high-tech repository with an intuitive structure helps facilitate insight and organize thoughts as information is retrieved.	Organization provides leadership in state-of-art content storage and retrieval, pushing out information in anticipation of need.

Figure 3. Scanning matrix

In this example, as you can see from the assessment performed in the assessment as shown in Figure 4, *scanning* would be assigned at a level 2 or *aware*. But it is useful to see that if the organization worked on the first practice, they would significantly improve the overall efficacy of their scanning discipline.

Scanning	Level 1 Ad Hoc	Level 2 Aware	Level 3 Capable	Level 4 Mature	Level 5 World-Class
1. map the domain of the system into a framework of areas to explore.	The map is created from those areas directly and explicitly connected to the area of interest.	In addition to the directly connected areas, the map is augmented with other areas "called-out" by the information collected.	A recognized framework (such as STEEP) is used to create a complete map, supporting evaluation of many different facets of the system.	Organizational processes exist to define and build a comprehensive map, exploring domains such as second-order impacts.	An anticipatory map is dynamically changed to provide insightful observations from underlying streams.
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Figure 4. Scanning example assessment

Conclusion

The Foresight Maturity Model is a first-of-its-kind for the field of foresight. It provides a framework for a clinical, numerical assessment of current practices; allowing for more informed decision-making on priorities and investments in foresight practices, while also helping to define the incremental steps an organization will need to make in order to improve its foresight activities. The model offers a much needed starting point for defining best practices in the field and measuring futures / foresight competency. And given the intangible nature of some of these practices, it is expected that the model will continue to evolve as it matures with use, improving its efficacy along the way.

Appendix

Foresight Maturity Model

The complete model with the detailed matrices can be downloaded from www.socialtechnologies.com/maturitymodel.

Practices for each discipline

Leadership: Clear ownership and active leadership to implement and institutionalize foresight capability.

1. Engage people in conscious and thoughtful actions to proactively create the future they have chosen.
2. Create an environment that provides timely anticipation of change, embracing positive changes and responding creatively to negative changes.
3. Communicate clearly the goals, results, and implications of foresight activities.
4. Create an environment and processes that drive foresight knowledge into action.
5. Recognize the cultural artifacts and mental models operating in the organization and how they influence organizational decisions.

Framing: Establishing the boundaries and scope of the endeavor.

1. Identify the root problems and true issues driving the project, reconciling with those that have been explicitly stated.
2. Set measurable and documented objectives which have the agreement of stakeholders.
3. Track progress toward objectives and reframe root problems and issues against progress and changes external to the endeavor.

Scanning: Collection of appropriate and relevant information in a format and time-frame that supports useful retrieval.

- Map the domain of the system into a framework of areas to explore.
- Continue to collect pertinent information from a range of diffuse and credible sources.
- Identify outliers or "outside the system" signals of change that provide insight to possible changes which can impact the system.
- Integrate external and internal information into a common framework and language.
- Create a useful and accessible information repository.

Forecasting: Description of long-term outcomes that contrast with the present to enable better decision-making.

1. Acquire insight into emerging ideas or themes with the aggregation of information into categorized clusters.
2. Consider the widest possible set of plausible alternatives in evaluating choices or decisions affecting the system.
3. Distill and detail plausible alternative futures into the operating set for consideration.
4. Validate foresight with an integrative view of prioritized alternatives.

Visioning: Creation of a preferred future that imaginatively captures values and ideals.

1. Elicit and incorporate goals, values, and aspirations of stakeholders.
2. Surface the underlying assumptions, espoused beliefs and values, and operational artifacts which establish the culture.
3. Articulate the unique contribution that frames the organization's view moving forward.
4. Craft the vision in a manner that is both inspirational and motivational, resonating with the hearts and minds of those who will follow it.

Planning: Ensuring that the plans, people, skills, and processes support the organizational vision.

1. Identify the implications and consequences of alternative futures and actions.
2. Explore a variety of potential strategies and options.
3. Choose and refine a strategy that optimizes progress toward the organizational vision.
4. Develop a plan to address the activities, processes, talent, and communications required to achieve the strategy.

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Notes

1. The CMM is no longer supported by the SEI and has been superseded by the more comprehensive Capability Maturity Model Integration (CMMI), of which version 1.2 has now been released (Wikipedia, 2009).

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