

Product-MASTERS

White Paper

Metrics Maturation: Benefits and Pitfalls

*Lessons Learned from Product Development
System Benchmarking*

By Joseph Kormos

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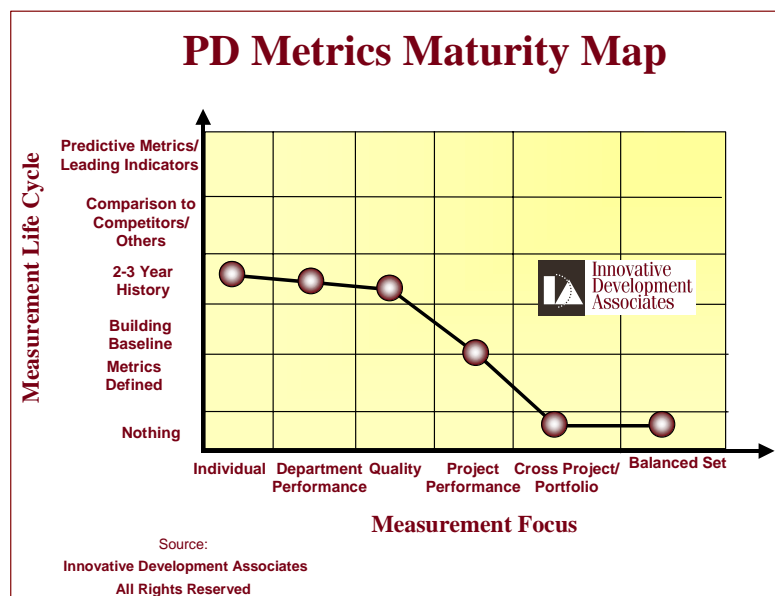
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METRICS MATURATION: THE STAGES OF MEASUREMENT FOCUS

As we examine metrics systems in companies of all types we've observed a relatively consistent maturation pattern for metrics practices. Organizations seem to migrate through a six stage progression of metrics focus. (Some of course never mature --stalling out in the early stages.)The six stages are shown on the horizontal axis of the chart below and explained as follows:

Stage 1: Individual Personal Productivity– In Stage 1 PD/PM measurement activities are limited to measuring individual performance usually as part of their annual/quarterly review process. For product managers it might include the number of competitive analyses provided to the sales force, new product proposals written, number of product announcements written, specific projects/assignments completed, customers visited, marketing requirements docs completed. In the development community it likely will be lines of code/function points, bugs fixed etc.

Stage 2: Departmental/Group Productivity – In Stage 2 the focus expands to a departmental view of productivity. Stage 1 metrics are now aggregated to evaluate the entire department or group. Usually these are effort related. Often metrics may be expressed as averages and may be used to set standards for individuals. Examples might include average number of lines of code per developer, number of customer visits for the product management group per month; overhead per employee in the



department. A high level example is R&D as % of sales. (By far the most over used PD metric of any type – which also may be the least valuable... but don't get me started on this).

Stage 2a: Departmental Focus with Quality Theme – At stage 2a, the metrics focus expands beyond measuring departmental effort and begins to evaluate results – almost always in the form of quality and reliability. “Defects” become the lingua franca. Stage 2a companies paper the walls with reports tracking defect density, defects found in last week, time to repair/close defects etc.

Stage 3: Project Performance Metrics– As a company progresses to Stage 3 the focus shifts from individuals and departmental silos to executing projects well. Cross-functional teams become visible. It occurs to leadership that establishing clear project targets (results and/or predictive) would be a good thing. Individual project teams design their metrics to communicate how they are doing and to encourage teamwork vs. individual performance. Yet, each team does it differently and commonality is an afterthought. Selected Stage 2a quality metrics are now complemented with metrics like: requirements churn; schedule slip; opportunity cost of one month delay; open staff positions on the project, hours of beta testing on the release, % of deliverables on schedule, budget adherence, #/% of tests completed, team turnover. % developers visiting customers. Really advanced teams exhibit dashboards of a balanced set of well thought out project specific predictive, results business and technical metrics.

Stage 4: Cross Project/Portfolio Metrics – In Stage 4 the focus matures to evaluating, predicting and driving the performance of the entire product factory. A common subset of project metrics is agreed upon by (or dictated to) all teams. Averages and trends across multiple projects can now be examined. Leadership can understand the differences in individual projects by comparing staffing levels, staffing ratios, average time spent on requirements planning and design; schedule prediction accuracy, milestone achievement, time to market and time to break even across a portfolio of projects. Overall bottlenecks can be explored by understanding the degree of resource availability and numbers of projects assigned to key resources and the average time to approve and staff a new project. The ability to get better and improve might be monitored by learning the percentage of projects ending with lessons learned or the number of new practices or process changes implemented per period. Decisions about deploying resources are aided by R&D spending profiles and the cost of cancelled projects. The ability to align with market initiatives would be aided by knowing the % of planned features targeting a new market or the % of enhancement suggestions included in next release.

Stage 5: Balanced Set – At Stage 5 management has defined a broad yet manageable set of metrics that can provide a quick snapshot of the health of individual departments, skill disciplines, individual projects and the portfolio of all projects and improvement initiatives. The balanced set varies by management level, is built from a consistent data collection approach, and combines per above article a set of predictive indicator metrics and results metrics.

The Vertical Axis

The following describes the characteristics of the vertical axis of the chart:

Level A: No Data – The organization has no metrics activity in this stage and is only beginning to demonstrate awareness of the need.

Level B: Metrics Defined – At this level the organization has defined the critical measures that will be tracked, what the data sources are who will collect the data and how it will be collected but no data has actually been collected. The organization knows “what’s important to us” and has translated that into metrics.

Level C: Building Baseline – The organization is actively collecting data to establish a baseline of typical historical results. Discussions continue on tweaking the actual metrics and their collection.

Level D: 2-3 Year History – A multigenerational two to three year history has been established. In cases where “cycles” are shorter (i.e two product releases per year) an equivalent may be to have 2-3 cycles of baseline data.

Level E: Comparison to Competitors/Others – Winning requires understanding the opponent/competition so, armed with a reasonable knowledge of their past performance the organization now deals with questions like “What is appropriate time to market?”, “Do we spend enough on new technology?” and “What is an acceptable rate of requirements churn in a volatile market?” Industry reports, benchmarking efforts, metrics consortia and best practices sharing help to flesh out the answers.

Level F: Predictive Metrics Correlation with Results (Final Score) – The combination of comparative data and a rich baseline of internal experience results in reasonably accurate predictive metrics for each stage of metrics focus. (Horizontal axis) For example, we can now say that when we out rebound our opponents by five or more per game we win and when we spend x hours in the weight room per season we usually out rebound our opponents. Or in non sports terms: “If a project scores an 8 or higher on the product success checklist it will be a winner 80 percent of the time. When we staff the team quickly and provide a customer research budget and a customer advisory team we always score at least an 8.”

WHY MEASURE

Some of you may be asking why all this talk about measurement in the product development arena? What do we expect to get from it? Here are a few answers.

Metrics programs can...

- Identify opportunities for improvement and assess what we can do better. (“Where should we focus our improvements efforts?”)
- Translate corporate goals into action by helping to set overall objectives and assess progress. (“So how do I evaluate my personal/team’s contribution to improved schedule predictability and customer value creation?”)
- Make progress toward goals visible allowing clearer communication, objective analysis and fact based decision making. (“Are we getting better?”)
- Identify successful practices which should continue. (“Is the effort we put into this process, practice worthwhile?”)
- Determine if we are getting the expected payoffs on investments, tools, techniques. (“How much do we invest in improved PD/Value Creation processes.”)
- Ensure success through target setting and learn from experience.
- Build baselines for Project Estimation (“How long did the last one take?”)

In a recent Management Roundtable survey of metrics practices in Product Development respondents reported the following:

51% reported clearer team communication

49% claimed earlier detection of product dev. Problems

42% indicated increased teamwork

35% identified a more robust process 33% indicated faster TTM and reduced cycle time.

METRICS PITFALLS

Metrics and Messengers

OK, there are benefits to this metrics stuff. But I hear a lot of you saying that a lot can go wrong in metrics efforts particularly those focused on product management and development. So we'll spend a moment or two on pitfalls of metrics programs.

We'll kick it off with our quote of the month:

"None love the bearer of bad news." – Sophocles

One of the common problems with metrics programs is the tendency to shoot the messenger. As a result nobody wants to be the messenger and/or the message gets changed to be palatable.

A true story.

One large US software company was ravaged by a new competitor. The command and control style CEO told the VP of Product Management to prepare a report of wins and losses against the upstart competitor. Knowing that the range of acceptability for the "Loss to XYZ Competitor Metric" was less than 20%, the bearer of won loss news took great pains to identify the presence of the newly sainted competitor in virtually every win the company had. Likewise a few of the mounting number of losses seemed to get lost in the shuffle. The CEO heard the story he wanted and could truthfully tell Wall Street "these guys are not a problem to us."

And everybody lived happily ever after – right?

Actually the company, it's market share in ruins due to decimation by you-know-who, was recently acquired. The CEO was long gone. The messenger? He's now a teacher. (You guessed it -- a math teacher!) (No insults to the teaching profession intended here. My wife is listening. After all he's productive and more valuable than... consultants!)

Metrics Pitfalls List

The above story not only describes the shoot the messenger problem but the pitfall that many metrics are subject to "gaming". So beware what you ask for you may get it.

Now on to the rest of our pitfall list. (Dutifully remembering – no sports analogies!)

1. Management does not clearly define the purpose of the metrics program and later forgets why it did it perceiving the metrics to be irrelevant. Often management doesn't take enough time to agree upon what is going to be measured and why.
2. Metrics don't link to the business goals of the organization. Without this the metrics program will sooner or later run aground on the rocks of the dreaded "so what" question. An indicator of this pitfall is too many technical measures; too few market customer/business measures. As we mentioned last week, improving our ability to consistently making money by satisfying customers with superior quality and value is what this is all about.

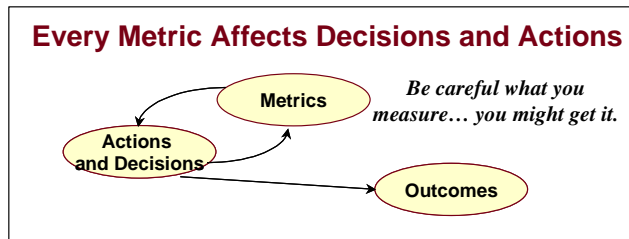
Tip:

To reduce resistance to data collection, software expert Karl Wiegers suggests classifying each data item into three privacy levels:

1. **Individual** – Only the individual knows his/her own data – though data can be pooled to provide an overall profile
2. **Project Team** – Data is private to the team but pooled with data from other teams to provide cross project insight.
3. **Organization** – All members of the organization can share the data.

July 1999, Software Development Magazine

3. Product professionals resist the program perceiving it as an indictment on their performance. Or, there is a cultural kickback from staff in fear that metrics will be used to judge individuals. Since much of the metrics data is self reported this damages the utility of the entire effort as well as impacts morale. (Metrics are a tool not a weapon.)
4. Betting on a single metric. No single metric solves all metrics problems and has no evils.
5. Too many metrics are collected making it impossible to focus on any of them. This is of course related to item 1 as well as a lack of coherence between the vision/strategy of the company, the role of product development and the metrics effort.
6. Because the metrics are too complex or abstract, too much effort is required to collect the metrics. (The first quality of a good metric is that it... listen closely here... be measurable!)
7. Whether due to too many metrics or poorly designed metrics, the real cost/time of collecting extensive, cumbersome metrics data is not considered. No commitment is made to gathering the info and for creating systems to automatically collect the data. Instead it's just added on as a burdensome manual task for an already overworked staff – and soon gets buried – or worse yet accuracy is compromised in an effort to short cut.
8. The causal effects of metrics are misunderstood and as a result wrong actions are encouraged and wrong outcomes result. (see "None love the bearer..." above.)
9. Rewards and performance review systems are not aligned with the goals of the organization and the metrics effort.
10. The metrics fail to generate management actions that are related to and proportionate to the metrics data. This can be because the management isn't paying attention, the culture lacks accountability, or the metrics were poorly chosen measuring things that logically lead to actions beyond the control of those owning the measurement effort.
11. Metrics become the primary/only method of assessment and result in less communication with management in stead of a better understanding of the situation. (i.e. A Doctor relying only on tests and measurements without understanding the patient's lifestyle or personal situation.)
12. Metrics become an end in themselves... metrics for metrics sake.
13. Assuming that one set of measures will be good for all time. No discipline, organization, market situation or company goals remains static. So, identifying the distant early warning indicators of desired performance can't remain static either.



About the Author – Joseph Kormos

A certified New Product Development Professional, Kormos is Principal and founder of Product-MASTERS a Cincinnati based Innovation Consultancy. He is also the Director of the Product Innovation Collaborative -- a best practice sharing and benchmarking activities for companies desiring to establish product innovation as a competitive advantage in their business strategy.

The author of two survey-based books on Product Development Best Practices, he is Vice President of the Tri-State Chapter of the Product Development Management Association (PDMA) and has served on PDMA's Body of Knowledge definition team for Strategy and Decision Making and as lead evaluator of the Machine Design Integrated Product Development Award. He is the developer of the Product Innovation Maturity Model -- a comprehensive framework for evaluating product development practices of corporations.

Offering deep knowledge in the areas of product strategy, new product introduction, product definition and positioning, customer research and Product Lifecycle Management Systems, his consulting clients have included major manufacturing companies in North America and Europe, including NCR, General Electric, Harley Davidson, Senco Products, Delta Faucet and Martin Marietta.