Executive Dashboard Implementation Guide

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Introduction

In 2009, the Management Engineering/Process Improvement Task Force developed a paper called "Executive Dashboard Development Guide." Shortly after its release, the task force quickly realized there were many more topics to discuss. Thus, in 2010, the team began the development of the Executive Dashboard Implementation Guide. The purpose of this guide is to share a wide array of thoughts on the entire lifecycle for dashboard development including pre- and post-implementation issues. These thoughts range from forming a governance structure to supporting the effort of measuring the dashboard value post-implementation. The information contained in this paper represents some "tried and proven" approaches, views, and perspectives – all of which will help you in your dashboard implementation journey.

The approach you use for your dashboard implementation will form the foundation for the lifecycle of your dashboard. For the ease of reading this paper, the ME-PI Task Force is representing their thoughts in support of the following approach. This approach was introduced during the HIMSS Dashboard series in 2008 and has been consistent for all efforts from the task force. This approach is presented as a guideline, which should be tailored to your specific project needs.

Dashboard Approach

A suggested lifecycle approach for the development and ongoing maintenance and improvement of a dashboard is to utilize a "Use Case-driven," iterative approach. This approach is depicted in Figure 1 below.

![Dashboard Lifecycle Diagram](image)

**Figure 1. Dashboard Lifecycle**

These phases will be referred to frequently throughout this paper as the sections support various activities of the dashboard lifecycle approach.
Governance (Pre- and Post-Implementation)

Governance is essentially about ensuring that business is conducted properly. It is less about overt control and strict adherence to rules, and more about guidance and effective and equitable usage of resources to ensure sustainability of an organization's strategic objectives.

Governance Structure

The governance structure specifies the distribution of rights and responsibilities among different participants on the project. This may include project members such as the board, managers, shareholders, and other stakeholders. It should spell out the rules and procedures for making project decisions. By doing this, it also provides the structure through which the project objectives are set, and the means of attaining those objectives and monitoring performance.

During the project initiation activity, a governance committee, reflective of all stakeholders, should be formed. The Governance Committee provides project oversight by creating and monitoring processes which align the project organization and outputs with enterprise strategies and priorities. These processes provide decision support for project sponsors, decision makers, and stakeholders involved in the project, organization and enterprise. Governance processes address adherence to appropriate policies, standards, and procedures throughout the dashboard lifecycle. Thus, governance is defined and initiated during project initiation, but operates throughout the entire lifecycle. Governance provides the ability to set realistic goals; assign roles and responsibilities; collate and communicate results; and learn from experience.

Governance Attributes

Figure 2 illustrates basic attributes and functions of a successful governance structure.
Policies

Corporate scorecards can provide key business activity measures to ensure business activities are compliant with corporate policies.

Standards

Standards provide controls over policies, decision-making algorithms, and presentation style of information. For example, consider the development of a standard form or "toolkit" for consistency of the "look and feel" of the scorecard. A toolkit can create standards for responsible parties to create processes for metrics creation.

Through universal adoption of a standard form for dashboard creation, everyone in the organization speaks a common language; they understand information sources, and they agree on the algorithm used to compute the metric for the dashboard.

Responsibility

Responsibility is a very influential aspect of governance. Establishing clearly defined roles and responsibilities helps ensure data continuity and reliability. Responsibility provides clear ownership of tasks so individuals have a solid understanding of the scope of the metrics they are assigned and how to create, summarize, build and present the metric resulting in a trustful relationship with the data and the corporate members involved.

Procedures

Procedures guarantee a consistent process for metric computation. Procedures should be well documented to allow for repeatability and consistency. Be cautioned that although procedures support structure, there also needs to be methods that allow individuals to try different paths or ways of doing things. In other words, carefully allow responsible individuals to color outside of the lines if it adds additional value to the overall results.

Checks and Balances

Governance models should include adequate controls to ensure thorough accountability and effective monitoring of the dashboard lifecycle. The controls should provide structured processes and feedback loops to ensure all metrics are configured and created through appropriate identification of information sources and locations. This is often done through the establishment of dashboard review boards.

Dashboard review boards should be established to conduct pre-implementation, implementation, and post-implementation reviews of the development and on-going operations of metrics. Some suggested goals of a review board include:

- First and foremost, catch errors in the project early, and thereby reduce the cost and risk of changes required later in the lifecycle. This, in turn, means that the overall project time is shortened, and that the business gets the bottom-line benefit of the architecture development faster.
- Ensure the application of best practices to dashboard implementation and operations.
- Provide an overview of the compliance of architecture to enterprise standards.
- Identify where the standards themselves may require modification.
- Document strategies for collaboration, resource sharing, and other synergies across project teams.
- Take advantage of advances in technology.
- Communicate to management the status of technical readiness of the project.

Checklists should be developed to be used for reviews which require descriptions of how the project and metrics meet the governance policies, standards and procedures. Some example checklist items are:
• Describe the major data structures that are passed between major system components.
• Describe how data is summarized to create metrics.
• Describe the purpose of the metric.
• Describe actions to take based on values of metrics.
• Describe the business/clinical and technical review process that was used to build the system.
• Describe the unit testing that has been used to test the system components.
• Describe the pre- and post-condition testing that is included in various metrics.

**Metrics**

Ironically, metrics are used to measure the development of metrics. To ensure everyone complies with policy and procedures, utilize a standard toolkit to measure the knowledge of the responsible individual, to provide the organization with a better understanding of the authoritative data sources, corporate processes, and provide insight into stakeholder expectations. Sharing a standard toolkit with responsible individuals and providing the ability to share with others outside of management will expedite a cohesive and collaborative corporate dashboard development effort.

**Summary**

Governance is a critical factor to an organization’s successful development and overall sustainability of a corporate or executive dashboard program. Using the governed capability model will not only support the dashboard process, but will also provide an excellent opportunity for others to understand the organization’s data sources, processes, and stakeholder expectations.
Business Process Readiness

Introduction

This section will introduce and discuss an underlying requirement to ensure that an organization’s business process readiness state is sustainable before and after implementing a corporate or executive dashboard. The concept of a state of business process readiness is to provide a foundation within the project initiation phase that will address how the organization reacts to the awareness of new information from the dashboard.

What Is Business Process Readiness?

Business process readiness in the context of corporate dashboards represents a desired “state” that an organization needs to achieve in order to fully understand and be able to react to the results and benefits that are expected from a dashboard presentation.

Let’s take a common process that we all take for granted: our gas gauge is heading towards the big “E.” The first step is to determine that, based on the gas gauge reading, you do in fact need gas. The second step is to determine where the next gas station is located. Finally, you pump gas into the car. Now we can continue with minute details of paying by credit card or by cash. However, the idea is that for every expected result from a dashboard, in this case the gas gauge, there is an expected process that needs to be ready to allow you to respond to the result. Furthermore, there are processes behind the scene of the gas gauge as well. The manufacturer of the car has already put in the processes to read the fuel tank level and convert the reading to either an analog or digital signal so that you can read the level on the gas gauge mounted on your dashboard.

Business Process Readiness Stepping Stones

The following steps can help establish business process readiness:

**STEP 1: Understand the organization’s stakeholders**
Develop an understanding of the organization’s stakeholders and what is important to them. For example, healthcare stakeholders are often interested in patient outcomes, length of stay, and financial status.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Goal</th>
<th>Stakeholder</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$3,200,000</td>
<td>Board of Directors</td>
<td>CEO</td>
</tr>
<tr>
<td>Profitability</td>
<td>4%</td>
<td>Board of Directors</td>
<td>CEO</td>
</tr>
<tr>
<td>Days in AR</td>
<td>&lt; 45 days</td>
<td>Accounts Receivable</td>
<td>Accounting</td>
</tr>
<tr>
<td>Adverse Drug Events</td>
<td>&lt; 2%</td>
<td>Board of Directors</td>
<td>Pharmacy Nursing</td>
</tr>
</tbody>
</table>

Figure 3. Example Indicators and Goals

**Step 2: What is the availability of the data?**
Authoritative data is very important to consider, as a copy of a copy degrades the integrity of the data. Depending on the location of the data, you will need processes in place to retrieve the information.
For example, let’s say a company uses glucometers that are able to transfer patient blood readings to a central health information system (HIS). If you pull a result report using the glucometer data and patient diagnosis data from the HIS, it must be understood how the information is calculated online and then retrieved for the dashboard. Again, it depends where the data is coming from as multiple sources may be required to perform the calculation. It would be further beneficial when retrieving the authoritative data if you know the relationship or association with other data. This way, based on dashboard results, you can understand the impact relative to other numbers or visa-versa.

**Step 3: Do you understand the calculations?**

Understanding date sources is only the beginning. There needs to be a common and agreeable understanding of the formula for determining the calculations needed. This is especially true if data will be coming from multiple facilities or data sources. Graphical representations help, but it would be wise to establish a process to complete the calculations and to periodically review to verify that the formula and calculated results are aligned with not only the present but the future as well.

For example, consider the case where a hospital is calculating quality measures for diabetics. One of these calculations uses the glucometer data and it reports that their diabetic patients are showing a marked improvement in their blood glucose levels. But one of the clinicians says that she thinks this is over stated. Upon investigation, they find that they did not filter out the correct diagnosis codes from the HIS system, so they actually did their calculations on their full patient population instead of using diabetics only. The lesson learned is that there was not a process in place to check with the stakeholder’s expectations, only assumptions which, if not caught in time, can be costly. Thus the hospital would have had a higher state of business process readiness if both stakeholders and dashboard developers were communicating effectively.

**Step 4: Do you have processes in place to sustain the dashboard?**

Improved business process readiness states can be attained by developing a method for maintenance and updating. For example, a hospital may have a champion who would collect the data from the responsible parties monthly and manually input into a presentation. Many times the responsible parties would challenge the numbers as this manual recording and calculation of data into a presentation could lead to “fat fingering” which is prone to error. The ideal solution is to automate the input of the data into the dashboard with the calculations already performed.

**Step 5: Assigning policies to maintain a readiness state**

The presentation of the dashboard, the frequency, and the buy-in from the executive leadership team to assign responsibilities to each of them, requires policy and process. Policy is important because even though company participants may agree that the goals should be presented monthly, not everyone may make their milestones on time. Additionally, it is crucial that the stakeholders agree on how the goals are going to be presented.

**Step 6: How to prepare for non-tangible indicators**

Measuring non-tangible results is a challenge. A high level of readiness includes the ability to identify the definitions behind the non-tangible indicators. As an example, first describe what may happen based on using “industry standards” and then describe the complete opposite of not using “industry standards.”

Figures 4 and 5 illustrate the use of supporting metrics which include the development of a measurement system from +10 to 0 and down to -10. Starting with the labels, the next step is to continue to write what the company would look like at +5, 0, and -5. For each quarter or monthly report subjective reviews can score where they are relative to the labels. It would be best if the labels could be tied to real metrics, like customer service.
Figure 4. Indicator Setting Definitions

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Use widget industry standards and best practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>+10</td>
<td>It is institutionalized within our organization to use widget industry standards and best practices. Because of continuous learning and transfer of knowledge we are able to provide superior widget strategies, forecasting, project management, and acquisition of advanced technologies aligned with adopting business process solutions before technical ones.</td>
</tr>
<tr>
<td>+5</td>
<td>We have become a program to institutionalize the use of industry widget standards and best practices. We have begun a knowledge transfer program to provide superior widget strategies, forecasting, project management, and acquisition of advanced technologies.</td>
</tr>
<tr>
<td>0</td>
<td>Status quo. We have yet to start this program.</td>
</tr>
<tr>
<td>-5</td>
<td>Minimal progress is being made identifying what widget industry standards and best practices consist of. A knowledge transfer program is being considered but yet to be put into writing.</td>
</tr>
<tr>
<td>-10</td>
<td>Our organization is completely unaware of what industry widget standards or best practices exist. Because of this lack of understanding we are unable to provide superior widget strategies, forecasting, project management, and acquisition of advanced technologies.</td>
</tr>
</tbody>
</table>

It is institutionalized within our organization to use widget industry standards and best practices. Because of continuous learning and transfer of knowledge we are able to provide superior widget strategies, forecasting, project management, and acquisition of advanced technologies aligned with adopting business process solutions before technical ones.

Our organization is completely unaware of what industry widget standards or best practices exist. Because of this lack of understanding we are unable to provide superior widget strategies, forecasting, project management, and acquisition of advanced technologies.

Figure 5 - Sample Industry Standards Comparison Analysis

Step 7: The data is presented—now what?
Use the person who is responsible for representing the data to help define and implement a process to be able to forecast or explain the findings. To ensure integrity of the date, it is important that the organization present the methodology behind the data sources and how the calculations are determined. A feedback mechanism is essential so that the responsible presenter can ensure they are retrieving, calculating, and displaying the metrics correctly. If the presenter does not have an answer, he or she must know where to turn for assistance. This way the stakeholders will gain a better understanding of the organization, its processes, and the positions that are required to have the knowledge to make the metrics and calculations work.

Step 8: “Have information, will make decisions.”
New information that is now available seems like a great thing, but what is an organization going to do with the information? How can they use it? These are questions that should be part of any executive meeting. It is critical to determine how information is going to be viewed and how the audience will use it, such as: Who is going to be in charge of keeping track of the requests? What impact will this information have on the original owners of the data? If there is change in the data, what are the communication processes in place to ensure that the calculation will either be or not be affected by the change? What is
the process to share the results? If someone has a question about the results, whom do they contact? All information needs to be “actionable” or there is no point to collecting it.

Summary

An organization needs to take the time to develop the necessary steps to reach a mature state of business process readiness. Not only will the stakeholders become more aware of their organization’s financials or critical business indicators, but they will be able to take this new information and turn it into knowledge by sharing it with their individual departments and other areas. Each department can gain a better understanding how to support the goals because it understands the data, where it is coming from, how it is calculated, and the impact on other information.
Developing Dashboard Requirements and Use Cases

After the initiation phase of the dashboard project where project team and strategies have been defined along with roles and responsibilities for team members, it is important to define the business and technical requirements as part of the dashboard design phase.

Identify Use Cases (Functional Requirements)

During the design phase, a suggested technique is to identify and develop use cases to document the functional requirements and scope for the dashboard. So, you may be asking yourself, ‘what is a use case and why would you want to use them’? Simply put, a use case is a description of the expected system behavior, in terms of a sequence of actions. A use case should yield an observable result of value to an actor (someone or something outside the system that interacts with the system). A use case contains all the steps (referred to as the ‘flow of events’) needed to produce an "observable result of value."

A good way to identify use cases for your dashboard project is to consider what each actor (user) will require from the dashboard system. Actors' needs are defined through functional requirements of the dashboard system. For each actor ask yourself the following types of questions:

- What are the primary tasks the actor wants the dashboard system to perform?
- Will the actor create, store, change, remove, or read data in the dashboard system?
- Will the actor need to inform the dashboard system about sudden, external changes?
- Does the actor need to be informed about certain occurrences in the system?

Let’s take the example of an emergency department (ED) that wants to improve the utilization of its resources to increase the throughput of cases and move patients through the facility faster. For the purposes of this example, the current state is defined as one where patients wait in rooms for extended periods of time, and physicians and other ED clinicians spend time waiting to get to the next patient.

Examples of use cases to identify in this type of scenario might be:

1. Register Patient
2. Weigh and Measure Patient
3. Assign Patient to Room
4. Nurse Examines/Interviews Patient
5. Physician Examines Patient
6. Medical Assistant visits patient
7. Patient Checks Out

Identify Performance Indicators

For each of these use cases, you should identify key performance indicators (KPIs), which are indicators that measure performance as well as related actions that will be taken to correct unfavorable performance. Using the list of use cases identified above, the Figure 6 summarizes some potential performance indicators and actions for this scenario. This is just to provide an illustration. Always use performance indicators and actions appropriate for your own installation.
<table>
<thead>
<tr>
<th>Use Case</th>
<th>Performance Indicators</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Register Patient</td>
<td>Add to count of number of patients registered.</td>
<td>If the count is less than some number, you may investigate to make sure all patients are being registered.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the count is greater than some number, you may investigate to see if duplicates are being registered.</td>
</tr>
<tr>
<td>Weigh and Measure Patient</td>
<td>Count of number of patients who are weighed/measured.</td>
<td>If the count is less than the numbered registered, put in place corrective actions to ensure all patients are weighed.</td>
</tr>
<tr>
<td>Assign Patient to Room</td>
<td>Calculate patient wait time before room assignment.</td>
<td>Create exception if waiting room wait time &gt; 60 minutes.</td>
</tr>
<tr>
<td></td>
<td>Calculate Patient “alone time” after room assignment before nurse visits.</td>
<td>Create exception if alone time before nurse arrives is &gt; 10 minutes.</td>
</tr>
<tr>
<td>Nurse Visits Patient</td>
<td>Calculate Patient “alone time” after nurse visits.</td>
<td>Create exception if alone time after nurse &gt; 10 minutes.</td>
</tr>
<tr>
<td>Physician Examines Patient</td>
<td>Calculate Patient “alone time” after physician visit.</td>
<td>Create exception if alone time after physician &gt; 10 minutes and investigate how to lower this number. May need to do a &quot;root cause analysis.&quot;</td>
</tr>
<tr>
<td>Medical Assistant Visits Patient</td>
<td>Calculate Patient “alone time” after MA visit.</td>
<td>Create exception if alone time after MA &gt; 10 minutes and investigate how to lower this number. May need to do a “root cause analysis”.</td>
</tr>
<tr>
<td>Patient Checks Out</td>
<td>Calculate total Patient “alone time” in room.</td>
<td>Set exception count limits for this calculation and do root cause analysis on problem areas.</td>
</tr>
<tr>
<td></td>
<td>Calculate total number of patients seen.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculate total time patient in room.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Update average wait time metric.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6. Performance Indicators by Use Case

See the section “Use of Benchmarks, Targets, and Thresholds” further in this document for more specifics on defining and setting performance metrics.

Figure 7 provides a sample format for documenting use case specifications.
Description of Use Case | Short High Level Description
---|---
Scope of Use Case | Describe what is included and what is not included in this particular use case.
Stakeholders | List those who are stakeholders for this use case. This will include representative users and management.
Pre-conditions | Conditions that must be in place before the start of the use case including things that trigger this use case.
Post-conditions | Conditions that will be a result or output of the use case.
Actor/Perspective | For each different perspective, you will define an actor and his/her corresponding activity steps. For example, nurses may have different perspectives for admitting an ED patient than the hospital administrators, so the activity steps associated with an ED admit event will be different.
Activity Steps | These are the steps numbered in the order they must occur to complete the use case. Focus on the “happy day” everything goes ok set of steps first. Later you can add in “alternate flow” steps for exceptions and error handling. You can identify training needs and workflow considerations in these steps.

**Figure 7. Sample Use Case Specification Format**

**Use Case Checklist**

The list below can be used as a checklist when creating business requirements for dashboards. This information can be documented in a use case specification document.

- Identify the “actors” in your target audience. Be sure to include executives, managers, clinicians, and any other pertinent group. It is quite likely these actors will have different views of the data so you will need to support multiple viewpoints.
- Identify the “use cases” for your functional dashboard project requirements, based on your goals and objectives.
- Identify non-functional requirements using traditional requirements lists to identify regulatory, technical, and other non-functional requirements.
- Identify potential key performance indicators and associate them to your use cases.
- Identify actions based on the dashboard results that are actionable. Remember that each performance metric needs to be actionable; otherwise, why measure it.
- Develop a list of action steps for each use case. Address workflow considerations and training needs for each defined use case by comparing to current workflow and identifying changes needed in the future.
- Validate that the clinician workflow will work with the dashboard by conducting walkthroughs of the use case steps with representation from your actors.
- Evaluate the impact on your organization.
• Obtain desired clinical best practice.
• Identify plans to improve.
• Graphically map the process (use case diagrams).

**Identify Non-Functional Requirements**

In addition to the functional requirements defined in use cases, there will be non-functional requirements such as regulatory and various technical requirements to ensure data is available in the format needed for a particular dashboard. When determining and documenting non-functional requirements consider the following:

- Review regulatory required documentation.
- Applicable Joint Commission requirements.
- Design data Architecture:
  - Do you have data to support the KPIs you determined in the business design?
  - Determine how often raw data needs to be collected, sampled or merged.
  - Design a data integrity approach for aggregated data from different systems.
  - Design considerations for completeness and validity of the data so that it is statistically significant; if data is not significant, then there is no purpose to collect it.
  - Consider algorithms that may need to be applied to transform data.

**User Interface Requirements**

Since a dashboard is a visual product, it is important to include visual prototypes to make sure the requirements include a graphical user interface that will fit in the clinician workflow and deliver outputs for all stakeholders. Develop prototypes of the dashboard presentation to ensure it is intuitive. Utilize data visualizations in a graphical presentation. Utilize design standards for a common look and feel across the dashboard.

![Dashboard Image](image.png)

**Operational Requirements**

In order to define operational requirements for the on-going day-to-day operations of the dashboard in the production environment, consider the following:

- Define service level agreements (SLA), policies, procedures for operations to specify things such as turnaround times on trouble reports, exception reports from various metrics that exceed the set boundaries, etc.
- Define backup/recovery strategies and requirements to ensure that during the project as well as operational times, all data associated to the development and operations of the dashboard will be recoverable. In some instances, reloading of data through standard load programs will yield recoverability, whereas in other instances operational data may need to be backed up.
periodically. This could involve database utilities as well as other operating system utilities and backup tools.

**Define Testing Strategy Utilizing Use Cases**

As requirements are defined, the strategy and high level test cases should be developed. Testing strategies will address how you plan to validate your dashboard.

Testing an executive dashboard will require considerations for the creation of data as well as data refreshes that will need to occur during testing. This involves design considerations for the creation and management of test data.

For each use case you have defined, there needs to be associated test cases. Be sure to create a test case for each use case perspective/view.

In addition, you will need to address technical test cases for the creation and management of the data.

**Summary**

The design phase is an important phase of a successful dashboard project. Be sure to include the design for people, processes, and the technology including how you will validate and test it.
Use of Benchmarks, Targets, and Thresholds

As discussed earlier in this document, one of the keys to the dashboard design phase is the identification of KPIs and corresponding establishment of targets for each KPI. Before targets are established, it is important to benchmark against other organizations similar in size and demographics. Knowing what is measured in other similar organizations may facilitate the establishment of targets and/or benchmarks for another organization. Establishing targets will be critical in helping an organization reach its specific goals.

Benchmarks

Understanding what other organizations are measuring and comparing KPI data with industry averages or with like-size facilities can provide context on how an organization is performing. Remember to select peer data that are most comparable to your organization: community hospitals, teaching hospitals, specialty hospitals, magnet facility, or academic medical centers. When reviewing your peer organization’s data, it is critical that you gain a full understanding of their reporting frequency and measurement criteria.

Benchmark data can be obtained either for free or for purchase from groups such as:

- Medicare Hospital Compare website (http://www.hospitalcompare.hhs.gov/)
- American Hospital Association (http://www.aha.org)
- University Health System Consortium (https://www.uhc.edu/)
- National Database of Nursing Quality Indicators (https://www.nursingquality.org/)
- Press Ganey (http://ec3.pressganey.com/)

To encourage ongoing process improvements, another approach would be to identify organizations that are considered industry leaders and then evaluate aspects of your KPI data in relation to theirs as a way of identifying what can be improved in order to take one’s organization to the next level.

Targets

The numeric value or “target” you define for your KPIs should reflect the performance standard that can be reasonably achieved based on your previous department- or organization-specific data. The target can be a fixed or variable numeric value. The latter applies if you anticipate some KPIs to be different during certain times of the year. For example, if surgical cases are tracked in an orthopedic specialty hospital, it may be important to take note of the time when the orthopedic surgeons are out-of-town attending their annual specialty conferences. This predictable activity would certainly lower the operating room case volume, which in turn may affect other finance-related KPIs. The target values defined for this KPI should be proactively adjusted during the initial dashboard configuration to account for the expected variation with certain days or weeks during the reporting period.

Some KPIs require closer monitoring on an hourly, daily, or weekly basis whereas others can be aggregated for review on monthly, quarterly, or yearly time intervals. KPIs that measure current performance may provide more useful information than ones that have a lag time. For instance, some finance-related KPIs such as the employee overtime utilization would be contingent upon the close of each biweekly payroll processing. While this is a key department indicator, any actions to alter the department’s performance based on this information would be retroactive instead of proactive. Similarly, the patient satisfaction KPI is reliant upon the surveys that are mailed out after a patient is discharged from the hospital. Therefore, survey responses received and tallied would be a lagging indicator of this key service performance.

As a performance indicator, KPI is not a one-time event, but rather a measure that is both continuous and repetitive. To ensure relevance and impact, it is customary to review KPI data on an ongoing basis to
determine if it is on target and within benchmark data. Although one data point that is off target may not generate cause for concern, a data trend should be investigated promptly and addressed accordingly.

In the likely event that you have consistently met some of your KPI targets, decisions must be made as to whether the bar should be raised by setting a higher target for that particular KPI or simply replacing it with other KPIs. This is helpful to prevent unnecessary KPI-fatigue.

**Thresholds**

In addition to the target value, you will need to define the acceptable “threshold” as the values of KPIs being monitored may fluctuate during the course of normal operations. The threshold values, expressed as a percentage of the target, would include both upper and lower threshold limits. Depending on the KPI and the frequency with which it is measured, it is acceptable to configure the upper and lower thresholds to be 5% above and 5% below the target value.

Of note is that thresholds may not readily apply for some KPIs because any deviations from the target value may be indicative of unsafe patient care practices (e.g., mortality rate, surgical site infection rate). One way to approach this is by defining what constitutes an alert and to use the red color text to indicate if the value falls outside of the alert range. You can use the “KPI Targets and Threshold Alerts Template” tool shown in Figure 8 to set up the required elements to define your department and organization-specific KPIs and their target, threshold, and alert warning.

<table>
<thead>
<tr>
<th>KPI</th>
<th>Description</th>
<th>Frequency of Measurement</th>
<th>Target</th>
<th>Threshold</th>
<th>Alert Warning</th>
</tr>
</thead>
<tbody>
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</table>

**Figure 8. KPI Targets and Threshold Alerts Template**

Executive dashboards can be a powerful way to track departmental and organizational KPIs. You can set realistic target values and thresholds to track your organization’s performance, obtain early alert warnings, benchmark against peer groups, and evaluate your data against the industry leaders and best practices. Engaging your organization ensures that everyone remains focused on meeting and exceeding the targets set for your KPIs and in so doing ensures that proactive improvements contribute to your organization’s reaching their overall goal.
Change Management

Achieving excellence requires close monitoring of how an organization is performing and a dashboard can be a useful tool to support this effort. Developing meaningful metrics is critical given the current economic, personnel, and time constraints. An organizational change management plan is used to ensure employees adopt and utilize the new way of measuring success.

An organizational change management plan is a prepared approach incorporating resources to help organizations and their people affected by the change move from one habit to a new habit. Helping an organization adopt change requires persistence, follow-up, and positive recognition.

An organization change management plan should be used for implementing an executive level dashboard as well as departmental level dashboards. An executive level dashboard may measure a company’s progress against its strategic plan, while a department dashboard may measure a department’s performance that is aligned to enable realization of the executive strategic enterprise goals. In both cases, changes need to be managed at each level.

Develop the Change Management Plan and Live by It

Before cascading a dashboard to employees, the development and implementation of an organizational change management plan can enable dashboard acceptance. Without employee’s buy-in and acceptance, the change may not be sustainable. Achieving voluntary buy-in will have a much longer-term effect than a coerced adoption to the changes. Attention to change management is crucial for adoption.

The following outlines the key components of a change management plan:

<table>
<thead>
<tr>
<th>Groups Affected by Change</th>
<th>ED Physicians</th>
<th>ED Medical Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will they want this change?</td>
<td>Unknown</td>
<td>Maybe not</td>
</tr>
<tr>
<td>Department director/sponsor/change manager</td>
<td>Dr. Sally Smith</td>
<td>Pat Jones</td>
</tr>
<tr>
<td>What is the benefit to this group or enterprise at large?</td>
<td>Patients are in a “ready” state when physicians see them</td>
<td>Expedited turnaround times</td>
</tr>
<tr>
<td></td>
<td>Increased patient throughput resulting in increased revenue and patient satisfaction</td>
<td>More efficient turnaround time for lab results may increase the quality of care for patients</td>
</tr>
<tr>
<td>What is our message?</td>
<td>We can improve hospital services</td>
<td>We can be a part of a positive change for patients</td>
</tr>
<tr>
<td>Groups Affected by Change</td>
<td>ED Physicians</td>
<td>ED Medical Technicians</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>How will we communicate the message?</td>
<td>Posters, physician’s lounge, monthly meeting</td>
<td>Let’s work together to understand patient issues and increase patient satisfaction</td>
</tr>
<tr>
<td>Reward for using</td>
<td>Services get better for the physicians and patients</td>
<td>Recognize in company newspaper and at meetings</td>
</tr>
<tr>
<td>Report success</td>
<td>Stories from patients or physicians</td>
<td>Stories from cafeteria users and patients</td>
</tr>
<tr>
<td>Sustainability Tactics</td>
<td>Report CMS adherence and how measures have pinpointed improvement opportunities</td>
<td>Report satisfaction</td>
</tr>
</tbody>
</table>

Figure 9. Sample Organizational Change Management Plan Excerpt

**Organizational Leadership Support**
Executive sponsorship of the dashboard development should be the responsibility of the executives and department directors. Executives should participate in both the development and deployment of all dashboards – including executive and departmental - to show their full support of this effort. Without visible executive support, the importance of the dashboard will not be observed by employees and may be discounted as a non-value added exercise.

**Communication Plan**
A major part of an organizational change management plan is a communication plan. Figure 9 above provides some high-level communication resources and messages based on specific target groups. Among them are:

- Identify key change ‘managers’ within each department who will authorize and reinforce the change.
- Identify change facilitators who are implementers of the change.
- Fund marketing materials and communication efforts.

When launching the change management plan, leadership must engage in discussions with employees. One way is to use feedback loops to gauge employee reaction and monitor and reinforce acceptance progress such as skip level feedback (where you skip a level of management to elicit feedback that might not be given to a direct manager).

**Training**
Develop a comprehensive training program to guide an organization through its change management efforts. The training components include listening to key influencers’ training ideas, developing the training materials, running a pilot, incorporating pilot feedback and improvements, maintaining the documentation, and assuring thorough distribution of materials. Ensure there are pre- and post-training evaluations with summaries for review so ongoing adjustments and improvements can be made as needed.

**Reward and Recognition**
Linking reward and recognition efforts to the dashboard will help drive acceptance and achieve the desired changes in behavior. Engaging Human Resources to update the performance review process and
forms will ensure all employee performance review objectives align with the strategic objectives. An example of linking the dashboard to an employee’s annual performance goals is provided below in Figure 10.

<table>
<thead>
<tr>
<th>Hospital Strategic Objective</th>
<th>Measure</th>
<th>Goal</th>
<th>Employee Actual Results</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUSTOMER: Increase patient satisfaction</td>
<td>“My satisfaction level with the care I received from the day nursing staff”</td>
<td>4 out of 5 rating overall</td>
<td>Over the last 12 months, 25 of Tom’s 500 patients completed the hospital survey. Tom’s overall ranking was 4.1</td>
<td>On target</td>
</tr>
<tr>
<td>CUSTOMER: Protect</td>
<td>Number of incidents auditors were able to log into Tom’s computer to see</td>
<td>0</td>
<td>Over the last 12 months, in-house auditors conducted 12 walk-around audits. They were never able to view patient data as Tom utilized locked screen saver when he was away from his desk</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Figure 10. Mid-year Performance Review Excerpt

Adoption Progress

Key indicators to tell whether adoption is heading in the right direction include a post-implementation review after the first six months. The higher percentage of metrics achieved, the more ingrained this change has become within the organization. This will require recording baselines of the desired metrics.

Desired Metrics and Outcomes

- Number of funded initiatives implemented to improve dashboard results has increased.
- Number of cancelled initiatives (misaligned or lower prioritization) has decreased.
- Number of department dashboards that align to the dashboard has increased.
- Percentage increase of customer satisfaction items measured by the dashboard (set realistic goals for customer satisfaction).

What if Adoption Seems Slow: Fuel the Fire

Once an organization implements its dashboard, it needs to closely monitor the adoption rate and adjust the approach if required. Listed below are a few suggested activities:

1. Hold regularly scheduled weekly or monthly feedback sessions to monitor the progress. Follow up to ensure all departments dashboards align to the executive dashboard. This is essential to gauge whether the communication plan is effective.

2. Remember that the new dashboard will be deployed, replacing many informal current processes. To help facilitate the change, require executives’, directors’, and employees’ performance reviews to be aligned with the dashboard results. Consider holding “skip-level” discussions. Discuss employees’ efforts to ensure strategic objective successes. If the current informal processes are not eliminated, the new desired process may not replace the old undesirable ones.

3. Be sure the dashboard metrics and expected results are well defined. If changes are expected in culture, values, and behavior, be sure employees know what is expected of them and how to change. If the message is not working, regroup and brainstorm next steps.
4. Realize that manual metric tracking costs will be incurred until a data repository can be implemented. Help employees survive the transition by utilizing proven industry change management methodologies such as Six Sigma, Quality Education System (QES), or other quality methodologies which address organizational change management. Be sure to include experienced employees to propose meaningful measures.

5. Publish the various levels of the dashboard metric results to all employees. This message relays why the organization implemented the dashboard and how the measures have helped us to analyze our current state and make changes for the better.

Final Thoughts

Managing organizational change throughout the entire implementation ensures that the change is executed and adopted as planned and is communicated to every level of the organization. A well-constructed change management plan reduces resistance to change and engages people by focusing on what matters. Periodic reviews and enhancements at defined intervals support and contribute to the success of the change process, in our case the dashboard implementation.

While it is relatively easy to focus on the tasks required of the dashboard implementation, it is a challenge to heighten awareness of the many forces that can influence how change is accepted throughout an organization. Proactively consider the human factors and workflow issues to manage organizational change and implement a strategy that ensures success.
Uses of an Executive Dashboard

Executive Dashboard (dashboards) can be an extremely valuable asset to an organization IF the organization clearly outlines their intended purpose prior to building them. Dashboards enhance the ability to uncover opportunities for continuous improvement by:

- Providing quick assessments of operations
- Providing alerts to potential operating/clinical issues
- Enhancing the ability to identify, track, and trend measures
- Allowing the ability to proactively address key areas

To further understand the potential uses of the dashboard, let’s take each component and map it to a few examples of how it may be used in a healthcare setting, as shown in Figure 11.

<table>
<thead>
<tr>
<th>Ability</th>
<th>Example Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess operations</td>
<td>Monitor revenues, ALOS, payer mix</td>
</tr>
<tr>
<td></td>
<td>Monitor days in accounts receivable</td>
</tr>
<tr>
<td></td>
<td>Monitor cost per defined unit (e.g., case, day)</td>
</tr>
<tr>
<td></td>
<td>Monitor department operations and patient throughput (e.g., ED wait times, NHPPD)</td>
</tr>
<tr>
<td></td>
<td>Monitor time to fill vacant positions</td>
</tr>
<tr>
<td>Alerts to business/clinical issues</td>
<td>Establish case management alerts (patient stays)</td>
</tr>
<tr>
<td></td>
<td>Continuously monitor quality measure Indicators</td>
</tr>
<tr>
<td></td>
<td>Monitor performance to established benchmarks</td>
</tr>
<tr>
<td></td>
<td>Monitor patient outcomes following treatment/surgery</td>
</tr>
<tr>
<td></td>
<td>Track key clinical data (e.g., lab values, vital signs), health behaviors</td>
</tr>
<tr>
<td>Track and trend measures</td>
<td>Trend average length of stay (overall, by physician)</td>
</tr>
<tr>
<td></td>
<td>Understand marketing trends (by payer, by physician)</td>
</tr>
<tr>
<td>Proactively address key areas</td>
<td>Address productivity issues</td>
</tr>
<tr>
<td></td>
<td>Address variations from quality indicators</td>
</tr>
<tr>
<td></td>
<td>Maintain full management of agency costs</td>
</tr>
<tr>
<td></td>
<td>Monitor employee turnover (by department, by role)</td>
</tr>
</tbody>
</table>

Figure 1 - Sample Dashboard Component Uses

In order to achieve these benefits, the organization must clearly define the intended purpose of the dashboard and not just create a dashboard for the sake of having a dashboard. Successful dashboards clearly have a full life cycle which, when implemented properly, become cyclical by promoting continuous updates, as illustrated in the Introduction section of this document. The key activities from the dashboard design and monitor phases that promote defining the use of the dashboard are described below.

**Key Activities for Useful Dashboards: Design Phase**

Most organizations embark on implementing a dashboard for specific reasons. It may be due to cost, revenue, or quality pressures, but the organization has a desire to monitor “something.” They key is in defining that “something.” During the design phase, it is critical to avoid trying to address all the issues you may be incurring with a single dashboard, but rather consider focusing on the key elements important at this time. When the dashboard is in place and action-oriented controls are built on the results,
improvements are normally seen. Once under control, an organization should refine the measures to the next challenge, and so on. A few rules of thumb are:

- Identify the handful of measures that are key (e.g., five measures).
- Map each measure back to the intended objective.
- Revisit the measures annually to ensure they are still viable.
- Develop use cases to outline how these measures will be used (this will force an organization to think through the full process).
- Develop targets for each indicator.
- Outline what you will do with the results.

**Key Activities for Useful Dashboards: Monitor Phase**

Following the roll out of the dashboard are the key activities of monitoring the dashboard results. For this phase to be successful, the organization must have an actionable plan for what it will do with results. This is the area where most organizations fall short. They have a dashboard but often do not follow-through with acting on the result. The monitor phase consists of multiple key activities for the successful use of the dashboard:

**Validation**
- Are the reported results accurate and will they be supported by business owner? If not, a validation process should be put in place to ensure the results are accurate.
- Will the results be periodically validated? This is highly encouraged to ensure accuracy.

**Owner Response**
- What accountability will the defined owner have on responding to the results? A monthly action report is highly recommended for all measures not meeting the defined target. The action report should include an analysis on why the target was missed as well as the action plan to address the variance.

**Executive Review**
- Who at the organization will review the monthly (or defined frequency) results? Will an executive senior leadership team (ELT) be in place? Will the results go to the board? Is there a specific approach for multi-hospital systems? While the *who* is critical, the organization must consider *how* the results will be shared (e.g., how and who will compile the results).
- Will the business owners provide an oral report to the ELT or board? This is highly recommended to encourage ownership for the results.

**Organization Action**
- What actions or changes will be put in place to address the changes? Will the owners be supported in making their changes? An organization must determine to what extent it will support the required changes to improve their results.

**Dashboard Updates**
- At what point will an organization eliminate or change the measures being reported on the dashboard? Many organizations change the measures after six months of stable reporting. Key to updating measures is going through the entire dashboard lifecycle starting with the design phase for all measures!
Summary

In summary, implementing dashboards can be a complex undertaking and therefore a project in itself. They take resources to maintain and time to act on the results. They are an extremely valuable tool, but thought must go into them in advance to get the most out of them.
Measuring the Value - After the Fact

Measuring results and return on investment is one of the most important aspects of planning enterprise business intelligence (EBI) program. A demonstration of future value is typically included as part of every organization’s proposal process and is required as part of the initial investment recommendation. However, once the program is in production mode, most organizations lack a clear and consistent methodology for continuing to measure value and results on an ongoing basis for the program as a whole. While many organizations include a return on investment analysis and may include potential results as part of project prioritization and the scope process, many do not comprehensively measure results or value over time. This section discusses the importance of measuring results and recommends the development of metrics for both the individual projects and the EBI program as a whole.

The first of the two key categories that will help demonstrate results of the business intelligence program for your organization relates to the EBI program. The program itself should have measurable results that demonstrate the growth, productivity and activity of the resources committed by the organization. These would include the measurement of key activities such as number of projects completed each period, utilization of key technical resources such as warehouse servers and hardware, visualization server and software, number of total and active users of the system, etc.

A second important list of metrics is related to the project management approach utilized by EBI program leadership. A clear understanding of what projects have been prioritized, how many projects are in development and what is waiting in the queue is vital to helping manage program expectations. A solid project management methodology including project phases and associated deliverables should be developed and reported against. A list of possible key program metrics is included below.

**Program technical metrics**

- Number of users
- Average activity of users
- Number of active databases in production
- Number of active reports / dashboards in production
  - Activity related to production reports / dashboards (how many users, how often are they used, peak usage times, etc.)

**Program and project management metrics**

- Number of project requests in development
- Number of project requests in queue
  - Time lag since initial date of request
- Number of projects completed
  - Average time to completion of projects
  - Average hours of effort for completed projects

Figure 12 is a sample of a relatively simple project management communication tool that utilizes Microsoft® SharePoint® to provide project and program status.
The metrics in Figure 12 will help the organization understand the value of the resources it has committed to the EBI program itself and help inform decisions around additional investment or expansion. The second set of metrics focuses on the results delivered as they relate to the content or output of the EBI dashboards and reports.

In order to demonstrate the complete value of an EBI program, it is important that each individual project have clearly identified and measurable results that are included as part of the project scope and deliverables. Assuming the EBI program as a whole is a success, the demand for projects will typically exceed available resources. Identifying key metrics that will be impacted by each project will assist in both the prioritization and results measurement processes. While the metrics described in the first category above will help the organization understand how its resources are being allocated, the metrics in this category will help the organization understand if they are being allocated to the right projects. Ultimately, EBI is a tool that should facilitate an organization’s overall performance management efforts. Measuring key metrics that reflect progress towards strategic or operational goals provide a bridge between a business intelligence tool and a performance management tool.

Figure 13 is an example of an executive level scorecard reflecting an organization’s performance on a number of key metrics. Summary performance is available at the top left, with detailed information at the top right and trended performance graphed at the bottom. Performance is measured against established targets for defined periods but is also trended to facilitate discussion around how the performance may be moving. A metric with a red indicator for the current period but with an improving trend line may be less worrisome than a metric with a green indicator but a degrading trend line.
Figure 13. Executive Score Card Example

The executive scorecard view can be complemented by a set of scorecards or reports specific to individual metrics.

Figure 14 shows one possible view of a single metric from the scorecard view above. This view highlights overall performance in the upper left, with detailed trend graphs and comparative department level performance to the right and below respectively.
Figure 14. Single Metric View Example

The particular form and format of these types of dashboards, reports or scorecards will differ significantly and will be tailored to meet the specific preferences and operating models of each organization. Metrics in this category will also vary widely, but should be related to the organization’s overall strategic goals and specifically to operational initiatives.

A dashboard project that focuses on patient access should include applicable metrics to help the organization assess patient access from multiple points of view, identify targets and associated gaps, highlight both poor and excellent performers and facilitate discussion and action planning when appropriate. Typical EBI visualization and reporting tools such as gauges, red / yellow / green light indicators and trended performance should be incorporated in the design and deliverables.

Each project identified and prioritized should have a targeted result that will be monitored and reported at multiple levels across the organizational hierarchy. An executive level report may include overall organizational information on a key metric while associated tools and reports would allow individual service line managers to drill into the performance at a lower level of detail.

This consistency of metric definitions and reporting will not only ensure a “single source of truth” but provide an analytic environment that will allow for constructive reviews of performance. Any resulting action plans can then easily be reviewed for success or failure by demonstrating how future performance will change as related to either a baseline or target.
Dashboard Maintenance

Dashboard Maintenance Actions

Dashboards are used to monitor and measure processes that are real-time in nature. However, a success factor for use is to keep the content current. Dashboards require ongoing review and maintenance such as:

- Clarify the dashboard’s message for employees.
- Update the metrics as organization priorities change.
- Change metric reporting frequency and approach.
- Fine-tune the dashboard as it matures.

Further Clarify the Message for the Employees

The techniques available for presenting data have evolved from simple charts and graphs to powerful, visually appealing real-time, consolidated, Web-based dashboards. Similar to a dashboard on a vehicle, executive dashboards can use data visualization with verbiage to organize and present information, making it easier to understand the metrics at a glance and facilitate immediate decision making, if needed.

A visual picture and/or words defining the metric can clarify the message. Visual clarification can occur by consolidating many screens and/or metric locations into one screen, thereby making it easier to find and monitor the status of multiple critical indicators at a glance.

Clarification can also occur by further defining what a measure means in mathematical terms as well as verbal definition. For example, this is achieved by explaining that the metric “Patient Exempt from Reporting” includes patients with allergies to our preferred drug of choice, patients who refuse treatment, and system exceptions such as we have no flu vaccine in supply to administer.

Once the explanation is given, employees can change their work priorities and habits to better align with the expectations that the dashboard presents. In the metric example given above, this explanation will cause all employees responsible for checking a box in an EMR “Patient Exempt from Reporting” to change what they do to adhere to the clarification given of the metric. If they previously did not check the box, they will now check the box (if the patient was allergic to our preferred drug of choice, refused treatment, or encountered system exceptions such as we have no flu vaccine in supply to administer are no longer included in our reporting).

It helps clarify what the metric means if employees understand what to do with the results. When the metric is combined with a fact, such as a benchmark that most hospital’s percentage of patient’s exempt from reporting is 6%, a hospital executive can understand what is occurring at the hospital with respect to patient exceptions.

Organization Priorities Change so Dashboard Metrics Will Be Added or Changed Over Time

Since priorities change and goals are achieved over time, the dashboard is a living document clearly communicating current priorities, targets, and expectations.

In 2010, many hospital executives had to research and add ‘Meaningful Use’ (MU) metrics introduced by the US Office of the National Coordinator for Healthcare Information Technology (ONC) into their dashboards in addition to the operating metrics already tracked at their facility). Figure 15 is a simplistic
A dashboard example of some of the changes (MU metrics) that could be added due to a priority change and how the metrics outcome could be after the first six months of tracking MU.

Figure 15. Candidate Meaningful Use Dashboard Metrics for Hospitals

The Figure 15 shows that as of March, 2011, this dashboard needs to change. Six metrics in the dashboard did not meet the target of 75% while five did meet/exceed 75%. The MU dashboard can now be split into separate views as shown in the Figure 16, a “Maintenance” and “Target” Dashboard. Executives can prioritize their work efforts in the “Target” areas, realizing that the “Maintenance” metrics have met their targets (which are a better use of their time).

Figure 16. Meaningful Use Metrics: Maintenance and Targets
The original “Meaningful Use” dashboard now changes as it details monthly targets for all metrics separating the maintenance to the left and highlighting those requiring more management intervention on the right, as illustrated in Figure 16.

**Frequency and Approach Adjustments**

Once an organization implements its initial dashboard, it needs to closely monitor the adoption rate and adjust the approach if required. Approach-type changes keep the dashboard fresh by highlighting what is most important to work on. An approach change could be to add all dashboard metrics together and report a daily organizational metric.

Analysts, managers, and executives at all levels can use dashboards to monitor, understand the underlying problems, be proactive, and make quicker decisions. But they may each require a different **frequency** to make the right decision.

The ‘measure’ steps in the Six Sigma Define-Measure-Analyze-Improve-Control (DMAIC) process can guide how to determine which metric frequency is needed. It asks questions about priorities to help determine the frequency and cadence. For example, data shows a different story when viewed on an hourly, daily, weekly, or quarterly basis. Root-cause analysis within Figure 15 for the metric “Claims submitted electronically to all payers” may need an hourly metric to analyze, whereas the metric “Lab results in coded format” may only need to be analyzed daily.

**CMMI Maturity Changes (Fine Tuning)**

Capability maturity model integration (CMMI) is a process improvement approach that provides organizations with the essential elements of effective processes that ultimately improve their performance. CMMI can be used to guide process improvement across a project, a division, or an entire organization. It helps integrate traditionally separate organizational functions, set process improvement goals and priorities, provide guidance for quality processes, and provide a point of reference for appraising current processes. (See [http://www.sei.cmu.edu/cmmi](http://www.sei.cmu.edu/cmmi) for additional details on CMMI.)

Every dashboard begins in CMMI Level 1. This is where the dashboard enables improvement and a movement toward optimization. Level 2 is where the dashboard is used for standard reporting. When you compare Level 1 to Level 3 where knowledge transfer has occurred, the message is very clear, and everyone can tell the story of how they contributed to the organization’s success.

Organizations generate an astronomical quantity of data stored in disparate systems. Level 4 indicates the data is converted into more meaningful information that can be quickly accessed and easily monitored, interpreted, and investigated to enable more proactive decisions at many levels within the company.

Figure 17 shows the progress as a dashboard matures. The success of moving to a higher CMMI level can be communicated to employees based upon the success experienced at earlier levels. However, any issue left unresolved from early level implementations will rear its ugly head in the next level change. Take care of those with a change management plan before attempting to move one level up. For example, if one department needs a metric frequency in hours instead of days, make that change before funding a direct information technology (IT) feed from one system to the dashboard (Level 4).
At level 4, the dashboard is linked to systems that capture events as they happen, and warns users through alerts or exception notifications when performance against established metrics deviates from the norm.

Getting to ‘optimized’ is always the goal (Level 5). One may think Level 5 is reached with a clear ED dashboard but then the need for additional metrics, such as the American Recovery and Reinvestment Act of 2009 (ARRA), arises.

Conclusion

As discussed, there are several reasons why the dashboard may change over time.

When an initiative like a dashboard is implemented, decisions are made with the information known at the time as to how it will look to meet the industry definition of ‘meaningful.’ Among the needs to update a dashboard are:

- Employees may need more clarification on the dashboard’s message.
- Organization priorities change so the items measured and reported on the dashboard change.
- Frequency and/or approach may change so the correct cadence is provided.
- Maturing and fine tuning the dashboard are important, so changes can occur as the dashboard matures from CMMI Level 1 to 5.
Lessons Learned

Driving Organizational Results

The implementation of dashboards and business intelligence in healthcare can result in both immediate and ongoing successes in a results-driven organization. In a quick, easy-to-view snapshot of data, dashboards are very effective in communicating metrics that demonstrate trends, weaknesses, and drive home how well you are doing. The impact can be tremendous, and the roadmap and planning for change will be critical as an organization moves forward. There are best practices and lessons learned that can be applied to most organizations, large and small, as they move towards a dashboard initiative. While the culture and financial environment, as well as the dynamics of an organization will drive the level of success in using and adopting dashboards, any organization should expect to achieve great results from this kind of effort. As you plan, several areas should be considered in your approach, as well as the operational and strategic impacts of using data in this way.

Implementation Considerations

- **Data must be harnessed to realize its power and deeper and secondary value. Otherwise, it is a sea of information that mostly goes under-utilized with multiple “ports of truth.”** Most organizations have a wealth of relevant data in their various information systems. Dashboards help to channel your information into a single view of the truth that becomes the “go to” source. They can demonstrate transparency, and ideally, all levels of users should be given access to the data. Divisional and departmental silos can be mitigated as data is shared more effectively across an organization. This single view can help foster collaborative initiatives when people begin to have their “aha” moments as they see information in a way that was never demonstrated before. Consider all your potential data sources in designing the repository that will support your dashboards. Plan to have as broad an access to the data as possible to help build operational awareness and synergies across the organization.

- **Dashboard data will be closely scrutinized.** In order to foster credibility as the single view of the truth, you will need to thoroughly test to make sure your data integrity is intact. Include the stakeholders in the testing and validation phase, and do not underestimate the time it will take to work through this phase. Once the dashboards win the trust of stakeholders, they become the “go to” single source for the information.

- **Credibility of data increases as it is presented in real time versus financial period end.** As you involve the stakeholders, you build a following that grows over time. The users begin to rely on the data to monitor their operations, goals, and key performance indicators. The views of data enable them to act in a more real-time mode versus after the fact. Using dashboards becomes more “mission critical” instead of a retrospective view of performance indicators, and operational managers will come to depend on the information to run their day-to-day business. Plan for robust backup and business continuity plans as you would for any essential application.

- **You may want to consider a focus on the folks “in the trenches” first rather than executive level.** Most organizations have mechanisms in place to report out key performance indicators. Your business lines and individual departments feed your key performance indicators that are reported to higher levels in the organization. Providing dashboards that focus on improving the operational areas that can be measured, monitored, and acted upon will provide initial quick wins that may translate into improved bottom-line numbers. After initial quick wins have been implemented, a focus on the executive level reporting can be considered to provide improved visibility to the broader strategic level of users.
Post-Implementation Considerations

- **When you can engage every level of user in the use of dashboards, it empowers the users of the data to be stakeholders in business performance and improving that performance.** You may see employee satisfaction increase in an area that has involved the staff in dashboards that monitor operational goals that they are held accountable for. As staff monitor trends and fluctuations in their own areas of activity, they often will take action. For example, accountability for acting on census fluctuations and flexing staff on a nursing floor. Traditionally, the nursing supervisor may initiate the flexing, but when staff are involved, they can pro-actively plan and ask to be scheduled off when they see census drop. The dashboard gives them some additional awareness which allows them to have more control over their schedules.

- **As the stakeholders realize the value, they are happy to be “champions” and showcase their dashboard results.** You can foster positive outcomes by having champions present directly to the hospital board. Internal case studies can be presented throughout the organization to help foster innovation and operational improvements in all areas. Healthy competition for customer satisfaction results can be fostered when published across the whole organization.

- **As you eliminate printing of reports, a “less paper” culture starts to emerge.** A positive result gained from the utilization and dependence on near real-time dashboards is the reduction in printing of reports. You can put a “going green” slant as part of the dashboard initiative, which can help to engage people to be supportive. You may be able to identify some hard cost savings by reduction in paper, copying, storage courier service, etc.

- **Demand can go beyond reporting “what is” into a tool of predictive analysis for performance improvement.** As stakeholders become more advanced in their analysis of dashboard information, they can assess trends and begin looking forward to “what if” situations. This is especially helpful for time studies, risk studies, staffing profiles, marketing efforts, and quality improvement initiatives. However, business rules must be clearly defined as you build your models for projecting out information along with capturing appropriate relationships for comparing data.

- **As demand escalates, governance for setting priorities will become increasingly important, especially in the areas of change management, prioritization, and sustainability for dashboard strategies.** A governing body, such as an office of strategy management, or decision support steering committee, can oversee these areas, and will help to ensure success in establishing and maintaining your dashboards. (Refer to the sections on Governance and Change Management in this guide for more details).

Final Thoughts

Dashboards can be a convenient window into the health organization, and as the stakeholders at all levels realize the value, the demand will only expand. **It is important to promote dashboards as an ongoing business intelligence initiative, a core business service, and not a one-time project.** The demand for business intelligence will drive the need for ongoing resources that are required for development, implementation, and maintenance efforts.

Using dashboards to help monitor areas such as census, staffing, bed turn-around, quality, gives the organization a tool that allows them to measure performance, cost savings and overall quantifiable benefits. These results can help justify investing in an ongoing analytics/development team that is responsible for providing and maintaining the dashboard tools and solutions.

A successful team should be collaborative, creative, and skilled in whatever platform you choose to implement. The use cases will continue to grow as you aggregate your data. You want a strong team that is forward thinking and can guide the users of the data to the best way to view and analyze the information.
Dashboards are the catalyst for your organization to move from just collecting data to using the data in a meaningful way.
Bibliography

The HIMSS Management Engineering-Performance Improvement (ME-PI) Community formed a “hot topic” group focused on executive dashboards. As its deliverable, the group opted to create a development guide for executive dashboards. Through our experience, we found that many organizations consider only portions of developing and implementing an executive dashboard, but rarely the compilation of the topics you will find in this guide.

The Executive Dashboard Development Guide has been developed with the expertise of more than ten individuals. These individuals have a wide array of experience – from provider organizations to consulting. We will continue to enhance our guide and share with members of HIMSS, healthcare organizations, and others who may have an interest.

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