WHITE PAPER

KPIS FOR EFFECTIVE, REAL-TIME DASHBOARDS IN HOSPITALS

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Abstract

The disparate and disjointed data silos across various hospital departments constitute the biggest decision-making bottleneck. They impede the gathering of real-time, actionable information about the hospital's performance with regard to clinical, operational and financial key performance indicators (KPIs). Most hospitals have business intelligence (BI) systems which provide post facto analysis and miss out on the real-time aspect. In such situations, the hospital's executives depends on more than one system to get any actionable data and is thus stymied in taking effective, problem-solving steps.

Dashboards generated by the BI systems and used by hospital administrators need to gather data on KPIs from varied sources in the facility and present a holistic view. With such data aggregation, a COO can obtain a real-time, 360-degree snapshot of the hospital's performance and take proactive decisions. At the same time, a dashboard must drill down into each of the KPI details to identify and eliminate the root causes for poor performance. In this paper we present our point of view on crucial hospital KPIs, how a dashboard can accelerate the speed and quality of decision-making and how it must present information.

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Introduction

Hospital's executives must perform the complex task of keeping pace with the dynamic healthcare environment – constantly changing patient volumes, fluctuating supply costs, stringent government compliance and quality requirements, asset utilization needs, and staffing shortages. To take the informed decisions that help the hospital maintain a competitive advantage, COOs need real-time actionable information at their finger tips. The disparate silos of data across various departments are the biggest bottleneck in providing actionable information. Mergers and acquisitions add to the diversity of hospital information system (HIS) application and data sources, thereby not allowing 'one version of truth' about hospital performance to emerge.

The need of the hour is to have an IT solution which can fetch data from all disparate data sources and present it in an intuitive form to a COO, all in real time. In this paper, we present our point of view on the information and features hospital COOs need to help them make informed decisions.

What information should a COO dashboard give and why?

Hospital's executives need to concentrate their energies on monitoring KPIs that are aligned with hospital goals. However, in this competitive environment, all hospitals have common goals of proving quality care at a reasonable cost. The most common KPIs which should be looked at are:

Type	Key KPIs	Drill down KPIs	How does it help a COO
CLINICAL These have a high impact on the outcome	Hospital incidents	No. of patients acquiring infections, Transfusion reactions, Bed sores, Postoperative respiratory failure, Postoperative pulmonary embolism or deep vein thrombosis, Postoperative sepsis, Postoperative hip fracture, Postoperative hemorrhage or hematoma.	A COO gets a quick snapshot on how the hospital is performing with regard to the quality of care. The drill down information provides insights on factors that need immediate corrective action. E.g.: If transfusion reactions are high, a COO may want to look at revising the blood transfusion policy by adding checklists or improving compliance to standard operating procedures (SOPs).
	Death rate	Postoperative death rate, Post-procedural death rate	Nation- and state-wide mortality rates are published by government bodies. A COO can benchmark the performance of the hospital and see how it has performed against national and state averages and also against its competition.
	Patient satisfaction	Courtesy score for staff, Quality of meals, Quality of physician care, Quality of nursing care, Housekeeping score,	Patient satisfaction data provides valuable insights into making adjustments in areas such as efficiency of the admissions process and managing admission of patients to a clinical unit. It is

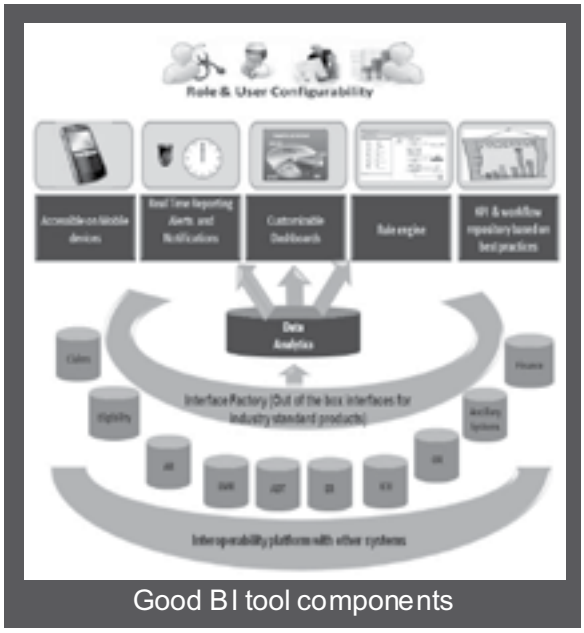
Type	Key KPIs	Drill down KPIs	How does it help a COO
OPERATIONAL These have a high impact on productivity, employee morale, and patient satisfaction		Admission process score	also valuable for staff training, morale-building and creative marketing. It is an effective, two-way communication – not only does the stress on quality alert patients that physicians are held accountable, but it also shows physicians that patients are pleased with the quality of care they receive.
	Medication error	Wrong medication, Wrong patient, Wrong dosage	Technology options like usage of computerized physician order entry (CPOE) and clinical decision support systems (CDSS) for allergy prompts, wireless patient identification and sensors can be deployed to reduce medication errors.
	Patient wait time	Admission, Discharge, Triage, Ambulance, Diagnosis (Lab, radiology)	Patient wait time directly influences the patient satisfaction level. Such insight allows COOs to target for improvement areas with higher wait times. Thus, staff can be added, training conducted to increase efficiency, and technology support provided for enhanced productivity.
	Average Length Of Stay (ALOS)	Admission (Last day/month to date/year to date) Discharge (Last day/month to date/year to date)	A daily, weekly, monthly, quarterly census of admission and discharge can provide insights into the patient throughput for a hospital. ALOS can drill down by diagnosis group, followed by facility and insurance plan, to individual patients and their hospital stays to provide insights into outliers. ALOS is often treated as an indicator of efficiency. All other things being equal, a shorter stay reduces the cost per discharge and shift care from inpatient to less expensive post-acute settings. However, shorter stays tend to be more service intensive and more costly per day. Very short stays can also cause adverse effect on health outcomes, or reduce the comfort and recovery of the patient. If this leads to a rising readmission rate, costs per episode of illness may fall a little, or even rise.
	Asset utilization rate	Bed utilization rate, Equipment utilization time, Equipment maintenance time, Equipment idle time	Assets generate revenue only when they are put to use. Tracking the performance of all hospital assets can have a huge impact on patient satisfaction and the bottom line. Low utilization levels lead to lost revenue and a very high utilization level leads to increased wait times, cancellations and diversions.

Type	Key KPIs	Drill down KPIs	How does it help a COO
FINANCIAL These have a high impact on the top line and bottom line	Payor performance	% Claims paid Reimbursements Amount Volume	Payor performance would provide insights into how payor contracts are performing and which one needs re negotiation.
	Physician performance	Revenue per physician Reimbursements per physician	Physician performance provides insights into how each physician is performing in terms of number of cases, revenue per case, utilization cost per case, bonuses and penalties incurred per physician.
	Hospital performance	Revenue Profit Margin Clinical Cost Reimbursement AR aging days	This would provide real time snap shot of the hospital performance in terms of Revenue, profit, margin, reimbursement vs utilization cost, AR by aging days and potential high risk AR that need immediate intervention.
	Referrals to outside centers	Diversion hours, Physician non-availability	Ambulance diversions have a very high impact on the clinical outcome and are a direct revenue loss to the hospital. Efforts should be made to keep this to minimum levels.
	Expense incurred by hospitals	Overtime hours, Test results error	Overtime hours provide an insight into capacity planning issues and have a direct impact on the bottom line as well as employee satisfaction. Test results errors result in lost revenue and resources, impacting the bottom line. Cause analysis needs to be carried out to reduce these occurrences.
	Physician performance	Revenue per physician, Reimbursements per physician	Revenue and reimbursements per physician provide details on how each physician and specialty is performing. Bonus and reimbursements provide an indirect measure of compliance with clinical pathways and hospital SOPs.

Characteristics of a good BI tool:

The hospital's business intelligence and reporting tool, which collects, cleans and presents the data, must enable the following features:

1. The KPIs need to be represented by:
   - Facility
   - Specialty
   - Department
2. Trends must be highlighted whenever possible against:
   - Benchmark targets
   - Monthly, Quarterly, Yearly performance
3. A decision-support section must be available to: Good BI tool components
   - Predict likely events based on trends, history and extrapolation
   - Suggest adjustments needed to meet benchmark targets

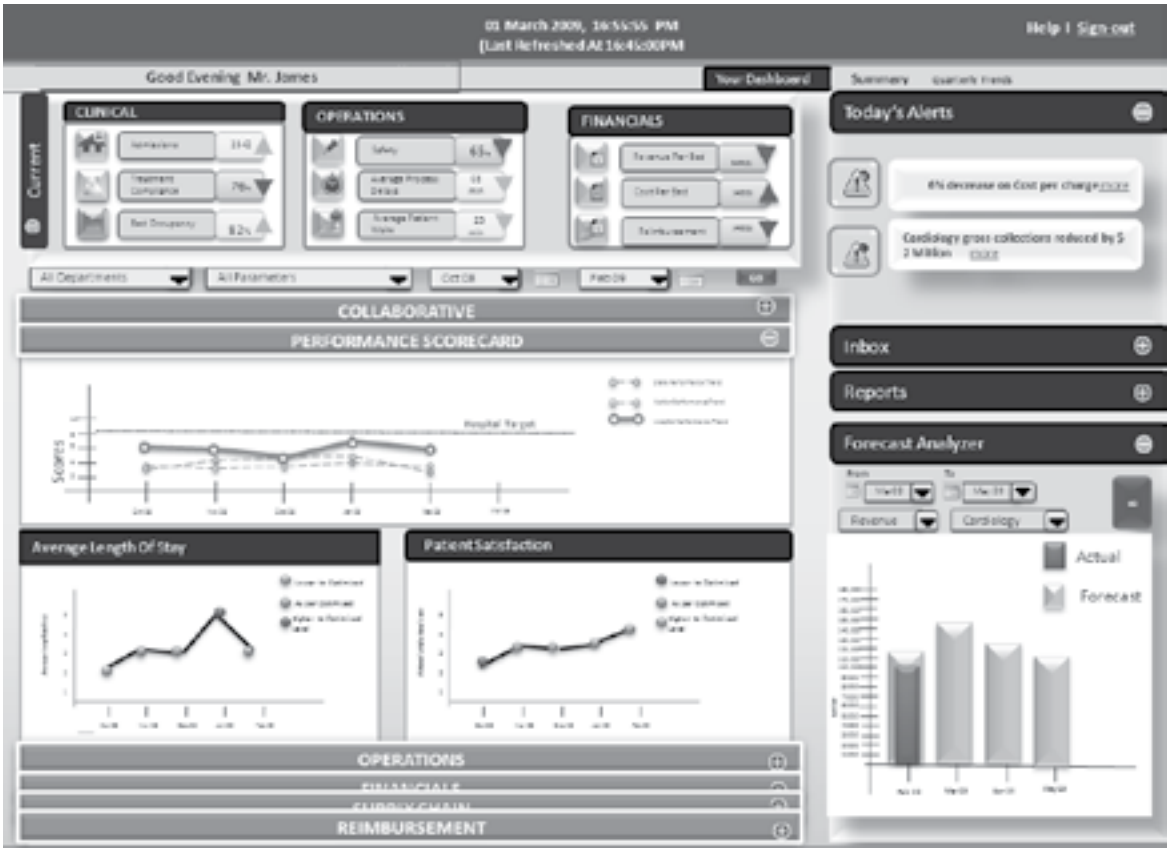


Good BI tool components

4. All KPIs must have clear ownership and owner contact details. The drill down reports/charts should be easy to e-mail and print.
5. Customized dashboard for quick access to information relevant to the specific user role.
6. Capability to access data feeds from other medical systems.
7. The tool needs to allow interoperability to enable corrective action by logging into the source system of KPI data.
8. Anytime anywhere access by allowing users to access screens over mobile.
9. Rule engine to configure alerts, escalations and decision support.

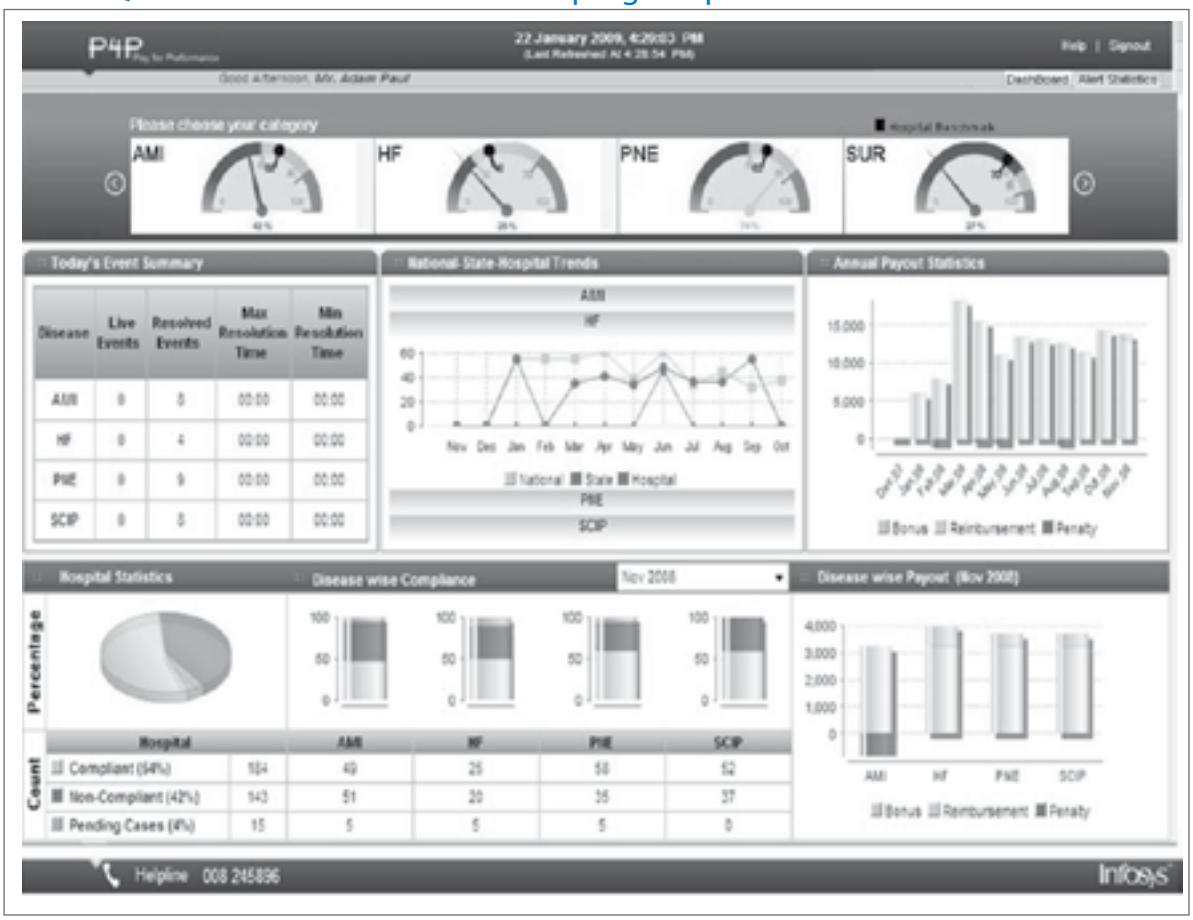
Today, visually intuitive and rich graphical dashboards such as the one shown in Figures below can dramatically accelerate the speed and quality of the decision-making cycle. This is not just about making dashboards more pleasing to the eye, but about users spending less time reviewing content and more time taking action. A dashboard should be information rich and not data rich.

Illustrative COO dashboard



Illustrative CFO dashboard

Illustrative CQO dashboard around CMS P4P program performance.



Benefits accruing from information-rich dashboards

The key to effective performance monitoring is access to information-rich dashboards with real-time data from all disparate hospital applications, coupled with decision support, alerting and escalation functionalities. The data's source system must be accessible for any actionable alerts (by providing a hyperlink in an alert mail to access source system) to initiate immediate corrective action. Such a business intelligence tool helps cultivate proactive behavior among the care givers. With a clear definition and representation of KPIs, information dashboards empower employees to actively make decisions that optimize across various objectives and look for creative ways to achieve goals. Clear communication and feedback is established around objectives and measures. After an effective BI dashboard implementation, typically hospitals have seen improvements in:

- Adverse events and unplanned readmissions: 7% reduction
- Patient satisfaction: 15% improvement
- Staff overtime: 11% decrease

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