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Engineering Transformation

WHITE PAPER

Real-Time Performance Assessment through KPI BASED DASHBOARD

Introduction

It is intriguing to know that during the industrial age (mid-nineteenth century to about 1975); companies would rely entirely on measures of financial accounting to capture its performance. Parameters such as Gross Profit, Cash Flow, and ROI were the only yardsticks that an organization's could use to measure its success. The evolution of Information Era in the 1990s completely changed the rules of the game, in that many fundamental rules of the industrial age quickly became obsolete. Large investments in physical assets, incorporating modern technology, and achieving economies of scale no longer ensured a competitive advantage – and the efficient management of financial assets/liabilities no longer guaranteed success.

The impact of the information era affected everyone, but it can be said that the impacts could most dominantly affected service oriented companies such as utility, transportation, consultancy, communication, financial, healthcare, and hospitality, when compared to other industries such as manufacturing and construction. This is because the value of intellectual parameters (i.e. Invisible assets such as skill, knowledge, motivated employees, innovative method, and customer satisfaction) is much more important in service companies, compared to a company's physical assets. The traditional financial accounting systems were (and still are) unable to put a realistic value on these invisible, but very important, assets, and thus link this value with the company's performance or profitability.

These gaps in value measurement gave rise to revolutionary and game-changing concepts like ***Balanced Score Card and Key Performance Index (KPI)*** based methods of performance assessment.

The Age-Old Method

Let us delve deeper and analyse why the age-old method of exclusive reliance on financial parameters in measuring an organization's performance is flawed. The major reasons are:
Financial parameters provide a comprehensive review of past performance and past events in the organization. However, this detailed financial view has no front window or predictive power for the future. Imagine driving a car using only the rear-view mirror – that does not make much sense, right? Not very safe either...
Financial parameters are abstract and almost useless in the decision making process of middle-level managers and working level employees. Employees at all levels of the organization need performance data that they can act on.
Performance parameters must be devised while keeping an eye on relevance for their day-to-day activities. Financial parameters do not cater to this requirement. Moreover:
Financial measures like, cost reduction efforts show positive impact on the organization's short-term financial statements. However, these efforts often target the long-term activities of the company that create real value such as R&D, Automation/Modernization, and customer relationship management. This focus on short-term gains at the expense of long-term value creation can obviously lead to sub-optimal usage of the organization's resources.

These financial metrics are of little assistance in providing present & futuristic indications of critical success factors like customer loyalty, product or service quality, or employee motivation/problems or market opportunities.

To avoid the shortcomings of the orthodox performance measurement techniques mentioned above, the Key Performance Indicator (KPI) based methodology became widely accepted. KPIs are among the most commonly used tools that companies employ to help manage more effectively and guide their progress. KPIs are used by organizations to measure, monitor and manage performance and they allow employers/employees to envision what needs to be done in order to improve the organization. ***In brief, companies use KPIs as top-level data to measure performance and plan for the future.***

KPI - A True Performance Yardstick

KPIs are an invaluable form of business intelligence. They represent a set of measures focusing on the aspects of organizational performance that are the most critical for the current and future success of the organization. However, we must keep in mind that monitoring, managing and analysing KPIs takes time and energy, so it is of vital importance that specific and appropriate KPIs are chosen to address the performance measurement needs of the company.

The Ten Commandments

Many organizations and top executives feel that KPIs and Dashboards, or Balanced Scorecards are available of-the-shelf and as a packaged standard deliverable on payment. It is of paramount importance to understand that development and implementation of a KPI based performance-management-system may entail a substantial change in a company's working culture -- most commonly by way of better transparency and accountability, on all levels. Therefore, the path forward necessitates extensive Change Management initiatives, every step of the way.

There are thousands of KPIs that can be viewed online. Some are listed by industry vertical, others by functional horizontal. It may be tempting to take the path of least resistance and try to adopt KPIs off-the-shelf, which may work in the short-term, but following the Ten Commandments while formulating specific KPIs is certain to be more beneficial (to a specific business or even an industry as a whole) over the long term. Here are the KPI Ten Commandments:

KPIs shall be important and relevant to the business – KPIs should be linked to strategic goals and be supported from the executive level through to middle-level managers and working level employees. People should be able to connect with these KPIs easily.

KPIs shall be actionable – Ensure that there is an owner who is accountable for each KPI parameter. He should have the authority and necessary support to implement change or minimize impact. The best way is to link each KPI with a team or group. A KPI is not good if you are unable to take corrective action based on chosen KPIs.

KPIs shall be measured frequently – The frequency will vary on the KPI and may range from constantly, hourly or daily. Parameters that are only reviewed every month or quarter may be strategically important but not useful for operational success.

KPIs shall provide proper context – Tracking actual performance against targets or previous best performance enables better insight and decision-making. The ability to provide drill-down views and hints on corrective action is always useful.

KPIs shall be motivating to the audience – It is very important for success of KPI that we reward if KPI improves performance. To be effective, KPIs must be reinforced with incentives. It may be necessary to restructure incentives systems when implementing KPIs. The only caution is to link incentives to KPIs until the improvement in KPIs have been fully vetted and authenticated using measurable data. Even making KPIs visible across an organization helps employees realize how their work is affecting the organization's overall goals.
It will incentivize them to work harder and be more productive.

KPIs shall keep dashboards simple & easy to interpret – It is essential to properly design reports, charts, and graphs for quick and accurate understanding at all levels. Today, dashboard applications have a plethora of visualization options. It is tempting to be carried away with impressive graphical data, maps, speedometers etc. To represent performance against targets. However, key information should be user-friendly and not too congested.

KPIs shall ensure education & information sharing – It is not enough to identify and provide visibility of KPIs. Users at all levels have to be educated about their usefulness and impact on their day-to-day performance. Employees must be involved at all stages of its implementation.

KPIs shall be based on valid data – When pressed, most executives find it easy to create KPIs for key value drivers. In fact, most industries already have a common set of metrics for measuring performance or success. Unfortunately, knowing what to measure and actually measuring it are two different things. Before executives finalize a KPI, they need to ask internal technical analyst if the data exists to calculate the metric and whether it is accurate enough to deliver valid results. If the answer is NO, then provisions must be made for additional measurement or testing. A KPI based on manual input by employees or tweaked data may lead to misleading observation or decision and should be avoided.

KPIs shall be timely – The results of KPIs should be reported frequently enough so that employees can make timely decisions but not too frequently, so that they are overwhelmed with data. Organizations should consider how urgent, sensitive, accurate, and costly measuring the KPI is before deciding how often to report on it. Additionally they should ensure that the results of a report are being acted on in a timely fashion.

KPIs shall be critical few, not trivial many – It is very easy to make a long list of seemingly important parameters and dump them in a huge display and term them as company's KPI. If we are measure too many things, we are really not measuring anything at all. This causes confusion as to what is important and the real intent is diluted. The best practice is to have 8-12 KPIs for the top executive level of any organization. It is important to determine if defined KPIs are relevant to meeting strategic goals.

Implementation of KPI based Real-Time Performance Management System

There is no **dearth** of performance related data in Industries. They are available from various sources:-

- The DCS of the process units,
- Plant Data Archiving System,
- Quality control database,
- Plant automation systems,
- Equipment health related systems,
- Environmental performance data,
- Data on Financial performance (Not accessible to everybody)
- Data on personnel, Administration and employee performance (Very closely guarded and confidential)
- Business related data in the ERP system
- Data in many personalized / legacy system

The Way Forward is to filter out unwanted information to ensure appropriate KPIs are available in near real-time and relevant to their intended audience.

The Basis of a Holistic Approach can be a Global strategic KPIs as a result of the global strategic planning or a Regional, local and product specific KPIs. For an organization in the manufacturing process industries, the KPIs can be constructed under the following subheadings:

- Business KPI
- Process KPI
- Production KPI
- Equipment KPI
- Inventory KPI
- Quality KPI
- Energy KPI
- Maintenance KPI
- HSE KPI

Having done this exercise the next step would be to ensure the following steps:

- Create a multi-disciplinary team
- Identify & prioritize KPIs for various levels
- Establish a data fetching schedule of frequency
- Determine data sources
- Identify users
- Conduct workshops to involve employees at all levels
- Finalize & implement data extraction methodology
- Make and execute elaborate plan for change management
- Display KPIs in user-friendly formats
- Create a steering committee for a regular review

Hence, it makes a perfect business case to have a real-time performance management system, fully aligned with operational & business philosophy of company, which is relevant and useful at all levels for achieving Operational excellence.

Proper implementation by a committed team is key to success of a KPI based real-time performance management system project. The major steps are:

- **Make use of an external expert group or agency having both domain knowledge and well versed in performance measures, having well-rounded consultancy skills**
- **Begin with senior management team (SMT) commitment and education including awareness campaign**
- **Identify critical success factors (CSFs) through brainstorming and workshops involving all levels**
- **Constitute a small multi-disciplinary KPI team for the project**
- **Implement KPIs using measurable data in time-bound manner**
- **Use prevailing system initially and facilitate transition to new system through proper change management**
- **Capture all performance measures in a database and make them available to all stakeholders**
- **Reward good performers in a KPI project**

Conclusion

As digital transformation ensures to disrupt, transform and reshape industries – the imperative to change for manufacturing industries is clear and present. Customers will need to shift their focus from reactive operations to proactive, predictive and profit optimizing operations. In order to achieve this stage of maturity, data and data quality is important and the consistent use of it from the operating room to the board room. The ability to extract the right data to drive KPI value creation will set companies apart in the future. Customers who leverage data as a critical asset will maintain a competitive advantage. The automation of data, knowledge and insights using KPI is an area of focus in the immediate future.

References: The main experts of this article had been posted earlier in ***https://blog.yokogawa.com*** in Aug 2016.

Notes: This article has some updations based on current trend & needs.

About the author: The author was General Manager (Advanced Solutions) in Yokogawa India Limited & now heading Industry Solutions in Utthunga Technologies Pvt Ltd. No 8, 27th Cross, Banashankari 2nd Stage, Bangalore -560070, Karnataka.