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**KEY PERFORMANCE INDICATORS (KPIs)
THEIR IMPORTANCE AND USE IN EVALUATION PHASE
A DASHBOARD APPROACH FOR DEFENSE RESOURCES**

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Abstract:

The age of information necessitates the assimilation of information at a very fast pace. Threat escalation and aggravation of situation is fast as tele and web based media unfolds the situations and molds the opinion more quickly than the press conferences of institutions. Defense organizations are no exceptions and are heavily being affected in the age of information overflow. Not only in contingencies and asymmetric warfare but combat ready status in peacetime difficult to be reached overnight. It is a systematic process of moving from conventional to modern data flow organization. Alone, database banks are of less use until converted into meaningful information. As the stocks and entitlement volume starts to increase, so becomes difficult the rational and judicious consumption along with adherence to adequate reserves level for optimum war potential. Defense Resource planning and accountability is a responsible regime as failures in conflicts have been often attributed in history for inadequacy of the rolling stock and failed logistic supply chains. The real time stock taking of defense resources can be achieved by spatial visualization of database converted into summary tables and graphical displays. As the consumption record is frequently updated in Enterprise Resource Management (ERP) web portals, the displayed status converted into Dashboards depicts accurate live picture of support commodities and war fighting potential. It also gives clues for economic consumption, prevent wastage and order replenishments in time considering the channels of supplies and shipment time periods. The Dashboards are evolved by the keen interest of end users and offer opportunity for executives and managers for quick glance at performance and evaluate the situation. Decision making matrices facilitate consensus. These ideas were crystallized during the presentations by the faculty and guest lecturers visiting DRESMARA. Lastly, the dividend that cannot be ignored is that realistic and accurate forecast is given for financial requirement projection. This results in austerity and diversion of resources for capability building. The Micro to Macro approach is essential to link field level management with strategic designs of higher command and control institutions. This paper is written based upon action research. Elaborate graphics are incorporated for on spot clarity rather than to rely solely at abundance of verbatim.

Key words: Key Performance Indicators (KPIs); e-Dashboard, Defense Resources, Goals / Objectives; Stock Management; ERP Worksheets; Interoperability; Graphical Display; Evaluation;

1. Introduction

Every organization is obliged for performance evaluation and remains accountable for principal amount spent as input to meet its Vision and Mission. The accomplishment of related goals and objectives can be measured by performance parameters. These can be tangible output figures or non-tangible fields that need indexing and conversion into graphs that indirectly give progress state.

2. The Key Performance Indicators (KPIs): An Overview

To have effective evaluation of organizational output, structured analysis of performance parameters is required. This demands that performance indicators should be determined with respect to their influence and criticality. This leads to their categorization

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

from generic to key performance indicators (KPIs). Their major utilization is to evaluate and steer the organization.

2.1 Definition of KPIs

There are many definitions of KPIs. In essence, “KPIs are a measurable value that reports progress against a result” [1]. At Oxford Dictionary, it is that in Business “A quantifiable measure used to evaluate the success of an organization, employee, etc. in meeting objectives for performance” [2].

2.2 Classification of KPIs -- Action Oriented & Informative

The popular contemporary approaches on KPIs classifies them in certain categories. These are mostly:

2.3 Action Oriented KPIs

To trigger an organizational level response upon identified areas of improvement and capacity building. These help to align short & long term goals with strategic intention of leaders.

2.4 Informative KPIs

Many fields augment the secondary and tertiary information needed to execute the action oriented KPIs. Time, Cost, Quantity and Revenue are often regarded as important most KPIs in projects. Moreover, Critical Success Factors (CSF), Key Risk Indicators (KRI) are monitored by the organization to identify potential risks and timely decision making. Trade-offs and Balanced Score Chart are also used for realistic projection of data for meaningful analysis. The various perspectives at hand can be viewed from the lenses of financial, customer, internal business and future growth perspectives. The emphasis is laid that the performance indicator consistently reflect the level of achievement for goals and objectives.

2.5 Action Research on KPIs: Control of Organization

Various factors emphasize importance and use of KPIs through innovative means to increase organizational input. Being a military organization, it requires a control system for Management of its Defence Resources and optimization through collective Decision Making. This may require systematic implementation to overcome resistance to organizational change and structure.

2.6 The Aim of Final Paper

The evolved Aim of the Action Research Paper comes out to be “To understand the Importance and Use of Performance Indicators in Evaluation of a Defense Organization’s Resource Planning. Moreover, to rationalize consumptions, inventory management, routine tasks achievement and stock optimization for operations via e-Dashboard of an Enterprise Resource Planner [ERP]”.

2.7 KPIs Based on Goals and Objectives

The popular thumb rule for conversion of organizational Objectives into Goals was given a user friendly perspective by Peter Drucker, an Austrian borne American who emphasized Management by Objectives [MBO] approach. His ideas were refined and published by George T Doran in 1981 [3]. The MBO specifies the objectives are to be

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

achieved by the management in a participative style through approaches of Top Down or Bottom up approaches. In the later one, the objectives are laid by the involvement of lower tiers through consensus of middle and top management members. Once the goals of the individuals are aligned by the organizations, workers strive hard to reach the commonly perceived end.

2.8 KPIs Based on Goals should be S.M.A.R.T

KPIs in the same sense are to be developed and shared with organizational members for coherence. The Peter Drucker's ideas were presented in his book published by Bouge Robert in 2018 [4]. The outlook of S.M.A.R.T Goals is equally applicable to selection of Key Performance Indicators as reflected below:

- S – Specific [KPIs should identify the progress of a specific field]
- M – Measurable [KPIs should be quantifiable]
- A – Assignable [KPIs should relate to somebody responsible for output]
- R – Realistic [KPIs should indicate a field for re achievable progress]

2.9 KPIs to Dashboard Flowchart: Leading from Known to Unknown

With pre-knowledge of KPI's nature and purpose, the issue is brought for their use and meaningful outcome to review organizational input and evaluate critical aspects for decision making. The block building approach involves the leading concepts, the pre-requisites, sample e-Dashboard templates and tapping of ERP data into graphs. The end results are presented in accurate output assessment. This in turn provides realistic feedback for yearly fiscal planning to link organizational goals with strategic plans of higher formations.

2.10 Utilization of Enterprise Resource Planner [ERP] for a Dashboard

Accurate data process and trend formulation helps in short term and long term performance evaluation for future planning for financial needs. Projection of a sample Dashboard is depicted:

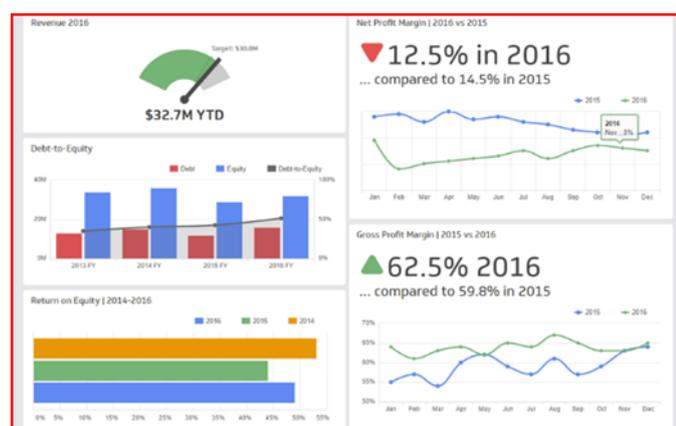


Fig 1 : Sample e Dashboard Template [5]

2.11 The End Goals: KPIs and e-Dashboard with a Single Entry Window

The process of The Enterprise Resource Planner (ERP) give access to data sheets which are bread and butter of respective work section/station, appointment holder or

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

project officer. The assimilation of needful information is accomplished through e-Dashboard which displays tapping of processed essential fields. Interoperability of ERPs is achieved by import worksheets.

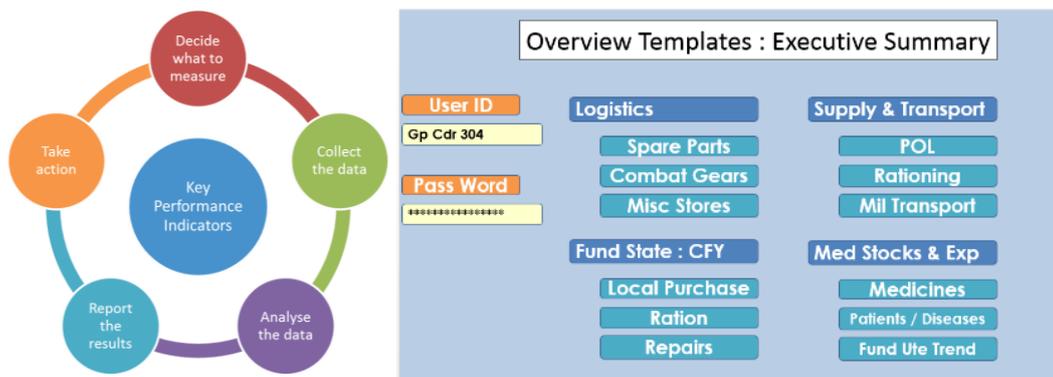


Fig 2. Cyclic Function for KPIs evolution and Executive Summary Sample Template [6]

Such a graphical display offers instant clues for brain storming by executive office holders and managers. Access to instant changes and live real time performance also helps to evaluate Quantified parameters. It also helps to ascertain practices and deviation from defined standards of customer care, quality assurance, maintenance ethics or transparency levels. Another higher level in customer service standards is reached by interface of CCTV frames with graphical comparison of public / end user opinion polls.

3. Defense Resources Management through e-Dashboard

The archives of Enterprise Resources data fields can be linked to produce a graphical view of monthly consumption trends. Further links of graph bars can lead to worksheets depicting date wise consumption and identify surges in consumption data. This helps to establish reorder points and to accomplish replenishment of stock. The data in ERPs is painstaking fed by every section after the advent of computers and is centrally available through Intranet networks.

3.1 POL Management by KPIs and e-Dashboard

During action research linked with defense resources consumption and replenishment, the POL emerges as an important area for lifeline of operations. Similarly, POL Tanks can be linked with a graphical view for capacity versus holding stock percentage. Essentially, all such custom search models can be incorporated with time function period calendar.

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

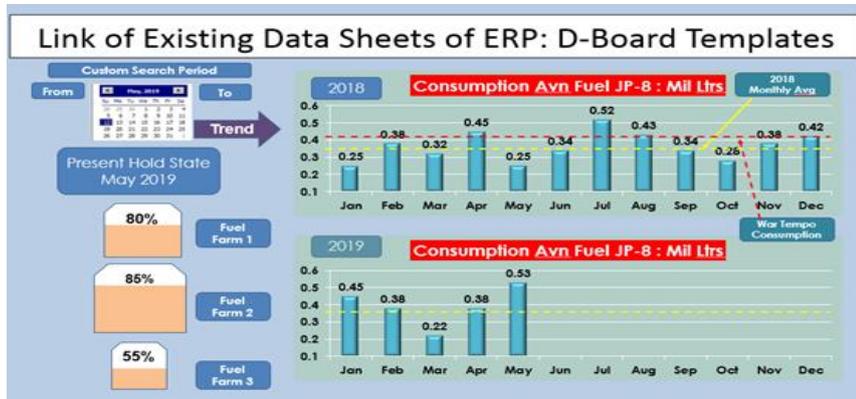


Fig 3. Cyclic Function for KPIs evolution and Executive Summary Sample Template [7]

3.2 Custom Search: Identification of Surge Points

The mechanism helps to identify surge points in consumption. Considering the supply chain, the replenishment delays can be mitigated with adequate storage to meet the war time reserve as described in contingency planning. Timely stock can be built with minimum shuttles. This would curtail duplication of efforts and help to avoid any interruption in operations and critical stage of execution of plans. It is to be noted that unusual and prolonged storage can result in chemical property changes thus causing faulty engine operations during flight.

| Fuel Farm No 1 | | | | | Fuel Farm No 2 | | | | | Fuel Farm No 3 | | | | |
|----------------|------|-------|------|-------|----------------|------|-------|------|-------|----------------|------|-------|------|-------|
| Mil Ltrs JP-8 | | | | | Mil Ltrs JP-8 | | | | | Mil Ltrs JP-8 | | | | |
| Date | Hold | Usage | Rem. | Rel % | Date | Hold | Usage | Rem. | Rel % | Date | Hold | Usage | Rem. | Rel % |
| 1 | 0.5 | 0.025 | 0.48 | 95% | 1 | 5.5 | 1.125 | 4.38 | 80% | 1 | 1.5 | 0.250 | 1.25 | 83% |
| 2 | 0.5 | 0.024 | 0.48 | 95% | 2 | 5.5 | 1.115 | 4.39 | 80% | 2 | 1.5 | 0.250 | 1.25 | 83% |
| 3 | 0.5 | 0.027 | 0.47 | 95% | 3 | 5.5 | 1.105 | 4.4 | 80% | 3 | 1.5 | 0.250 | 1.25 | 83% |
| 4 | 0.5 | 0.027 | 0.47 | 95% | 4 | 5.5 | 1.095 | 4.41 | 80% | 4 | 1.5 | 0.250 | 1.25 | 83% |
| 5 | 0.5 | 0.028 | 0.47 | 94% | 5 | 5.5 | 1.085 | 4.42 | 80% | 5 | 1.5 | 0.250 | 1.25 | 83% |
| 6 | 0.5 | 0.029 | 0.47 | 94% | 6 | 5.5 | 1.075 | 4.43 | 80% | 6 | 1.5 | 0.280 | 1.22 | 81% |
| 7 | 0.5 | 0.030 | 0.47 | 94% | 7 | 5.5 | 1.065 | 4.44 | 81% | 7 | 1.5 | 0.380 | 1.12 | 75% |
| 8 | 0.4 | 0.031 | 0.37 | 92% | 8 | 5.2 | 1.055 | 4.15 | 80% | 8 | 1.4 | 0.320 | 1.08 | 77% |
| 9 | 0.4 | 0.032 | 0.37 | 92% | 9 | 5.2 | 1.045 | 4.16 | 80% | 9 | 1.4 | 0.250 | 1.15 | 82% |
| 10 | 0.4 | 0.033 | 0.37 | 92% | 10 | 5.2 | 1.035 | 4.17 | 80% | 10 | 1.4 | 0.250 | 1.15 | 82% |
| 11 | 0.4 | 0.034 | 0.37 | 91% | 11 | 5.2 | 1.025 | 4.18 | 80% | 11 | 1.4 | 0.250 | 1.15 | 82% |
| 12 | 0.4 | 0.035 | 0.36 | 91% | 12 | 5.2 | 1.015 | 4.19 | 80% | 12 | 1.4 | 0.250 | 1.15 | 82% |
| 13 | 0.5 | 0.036 | 0.46 | 93% | 13 | 5.5 | 1.005 | 4.5 | 82% | 13 | 1.5 | 0.250 | 1.25 | 83% |
| 14 | 0.5 | 0.037 | 0.46 | 93% | 14 | 5.5 | 0.995 | 4.51 | 82% | 14 | 1.5 | 0.250 | 1.25 | 83% |
| 15 | 0.5 | 0.038 | 0.46 | 92% | 15 | 5.5 | 0.985 | 4.52 | 82% | 15 | 1.5 | 0.250 | 1.25 | 83% |

Fig 4. Localization of Surge point in Consumption and ready Link for Storage efficiency

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

3.3 Aircraft Spares Inventory Management and Replenishment

A lot of advancement has taken place in this field whereby electronic Bar, QR coding and RFID Inventory count management has developed. [8] This of course results in instantaneous update of the spares inventory which was a laborious and time consuming job in the past. Consequently, fast moving and show stopper items are timely ordered.

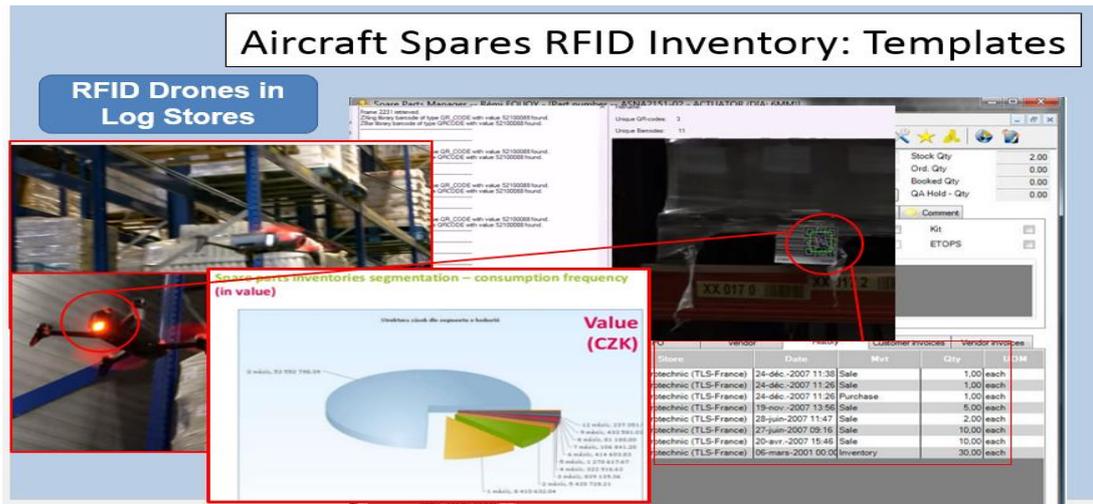


Fig 5. Update of A/C Spares inventory & Worksheets by RFID drones in Log Depots [9]

3.4 Hospital Workloads / HR Disease Trends & Medicine Consumptions

Similarly, the monthly trends of Out-door and In-door patients can be plotted. The seasonal hypes in workloads suggests study of Diseases Trend. This can be targeted with Preventive Health Campaigns in order to maximize the availability of work force and retain organizational performance. Consequently, nutritionists can target patient clientele instead of medicine therapy.

Consumption of medicines trends can be focused to identify potential factors in drop of immunity and in order to minimize drug dependency. This rules out the possibility of abnormal issue or retention of old medicine stock by entitled patients in a military organization. End results are reduction in med boards, austerity and HR health. However, access to such this data is to be limited for consultation by concerned hospital management and executive committee only.

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

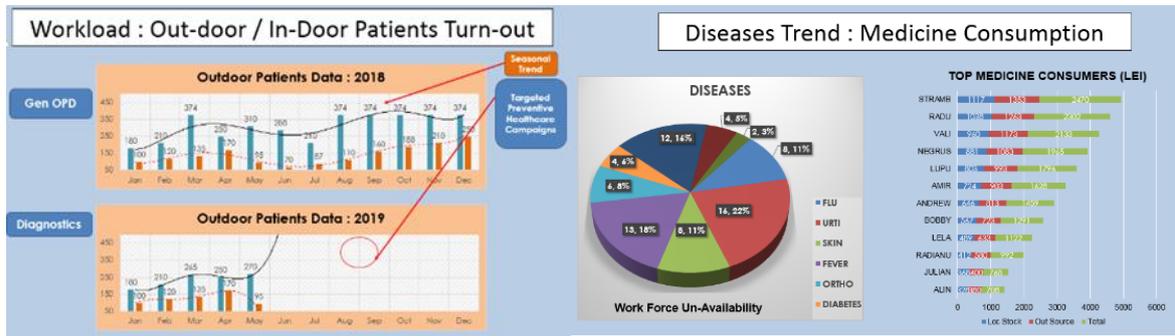


Fig 6. Patient Workload & Monthly trends/ Plot of Diseases & Top Medicine Consumers

3.5 Crisis Management – Blood Donation Recall

Similarly, the Blood Group data and donation record with available frozen stock can be databased and linked with portals of e-Dashboard. This aspect becomes critical in times of shock and awe and scale of contingency or mass casualties.

The important feature of such templates is expand and squeeze feature for search criteria with soft buttons to clutter or de-clutter the visible screen and auto-sum calculation. Over here, highlighting any number and clicking generates the list of available donors of a particular blood group and as per medically restricted matrix for transfusion eligibility.

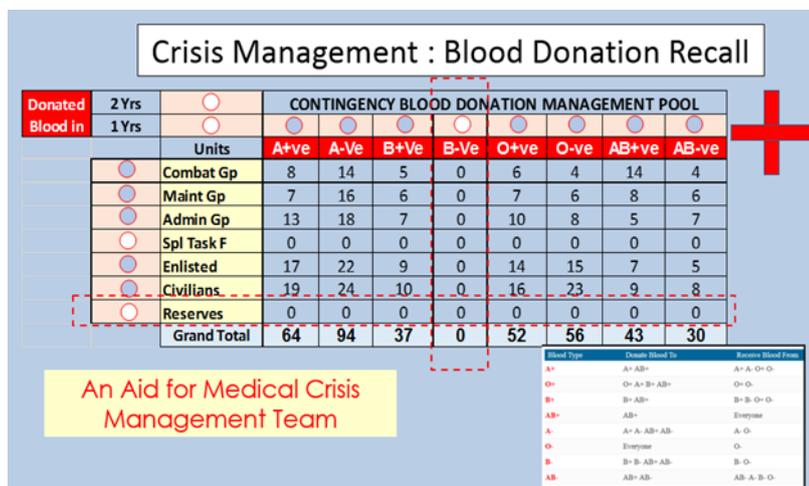


Fig. 7. Matrix for Blood Groups and available Donors Spread in various Units [10]

3.6 Military Transport Fleet Management

The above explained template pattern is also helpful for management of a vast fleet of Military Transport. Once maintained in hard format, the job is cumbersome due to frequent shifting of inventory amongst the user sections unless restriction on shifting is imposed due to specific role.

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

| Mil Transport Fleet Management | | | | | | | | | | | |
|--------------------------------|----------------|---|---|--------|-------|--------|--------|---------|---------|-----|-------|
| Age of MT | 2 Yrs | ○ | DESCRIPTION OF MILITARY TRANSPORT INVENTORY | | | | | | | | |
| | 1 Yrs | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | | Units | Car 3K | Car2K | Jeep H | Jeep L | Truck L | Truck H | Amb | Tow T |
| ○ | Combat Gp | | 1 | 3 | 1 | 0 | 6 | 4 | 3 | 2 | |
| ○ | Maint Gp | | 2 | 5 | 2 | 0 | 4 | 3 | 2 | 3 | |
| ○ | Admin Gp | | 3 | 6 | 3 | 0 | 4 | 2 | 2 | 2 | |
| ○ | Spl Task F | | 4 | 8 | 4 | 0 | 3 | 4 | 3 | 1 | |
| ○ | Enlisted Dept | | 5 | 9 | 5 | 0 | 5 | 4 | 2 | 0 | |
| ○ | Civilians Dept | | 6 | 11 | 6 | 0 | 6 | 6 | 2 | 0 | |
| Grand Total | | | 21 | 42 | 21 | 0 | 28 | 23 | 14 | 8 | |
| Grand Total : | | | | | | | 157 | | | | |

Fig. 8. Matrix for Inventory of Various Category Mil Transport Types and Age

3.7 Management of Sustainability Funds: Consumption Trends/Bills Payment

The yearly allocation funds for sustenance and support need to be judiciously utilized as per defined quarterly milestones. Likewise, expenditures are done on the repair and maintenance of inventory, machines and military transport. These levels of allocation, commitments, expenditures and imbursement state of payments can be tracked with graphical view hyper linked with deep level custom search. Ultimately, the Life Cycle Cost for service life of held assets is reduced.

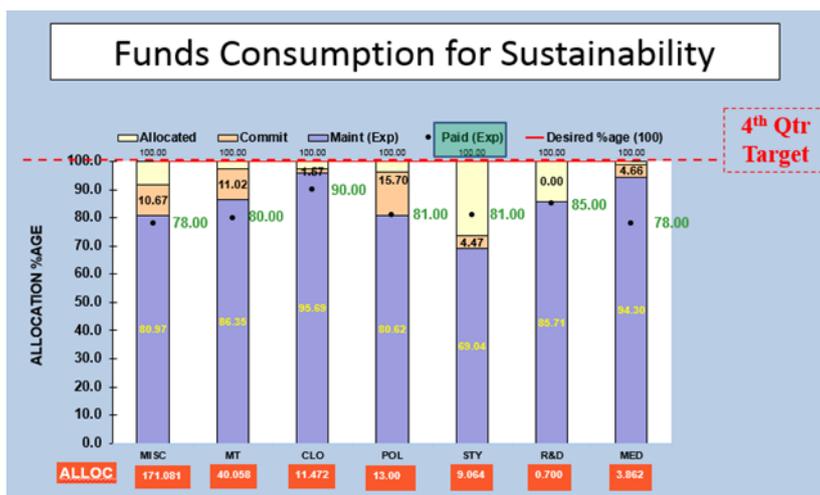


Fig 9. Stacked Graph Bars Depicting Funds Expenditure, Commitment & Bills Payment

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

3.8 Ration Stock Accountability – DOS Management

The daily feed of data in respective portals of existing Ration Management data sheets can be configured to generate template for dashboard. Instant and real time stock reduction cues help to order replenishment and prevention of perishable stock. In peacetime and contingencies, maintenance of Days of supply (DOS) [11] is extreme important and delicate managerial affair.

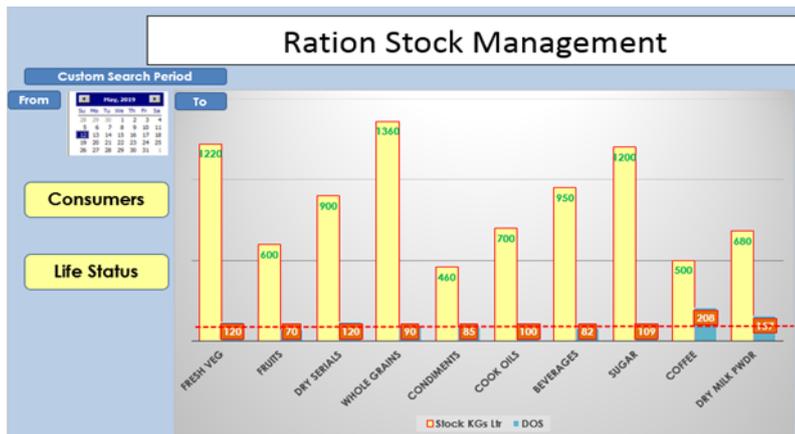


Fig 10. Stacked Graph Bars Depicting Funds Expenditure, Commitment & Bills Payment

3.9 Superior Management – Hi-End Gadgets for Accountability & Transparency

The high end gadgetry such as QR/Bar Code, RFID readers for automated tools / inventory management systems ensure accountability of traffic together with Electronic Check Posts in designated areas. Moreover, where customer services are involved; voice and screen capture of desktop PCs can be compared with background CCTV to retain circumstantial evidences. Moreover, the customers Bar-coded transactional slips front side reconciles the data at a rescan for POS deposits and financial reconciliation. Balance sheets are updated instantly with graphs.



Fig 11. Elect Cash Machines, RFID / QR / Bar code readers at POS outlets / Check posts

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

3.10 Customer Feedback on Care & Satisfaction / Service Provider Evaluation Transactional slips can have rating codes at the back to instantly provide the feedback of the end users. Above explained set-up helps to achieve very high levels of customer satisfaction as per latest ISO standards. Additionally, the net public rating can be assigned a modest value say 60% weightage in total annual performance evaluation of an individual. Once culturally accepted with the passage of time, setup result in equilibrium in customer & service provider’s relationship.

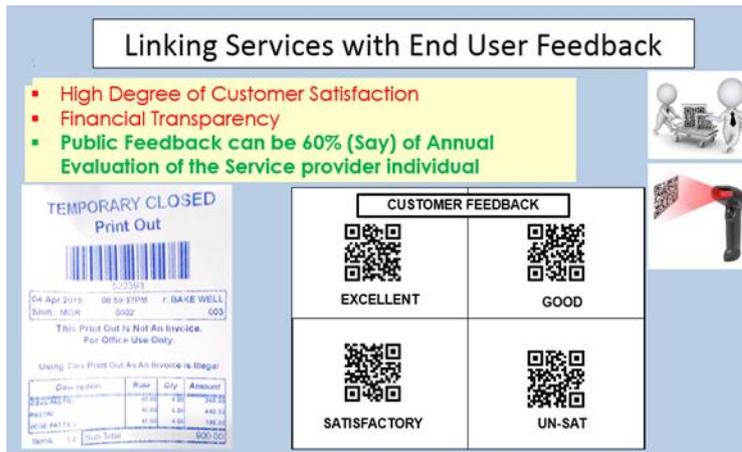


Fig 12: Instant Feedback on Ratings by Scan of Backside QR codes of Transactional slips [12]

3.11 Matrix for Consensus in Collective Decision Making

The organizational Decision Making Matrix can also be automated. This way, a non-structured function can be brought to a structured and tangible format within a Dashboard.

3.12 Leading from Micro to Macro — Financial Management for Strategic Goals

Accurate data process and trend formulation helps in short term performance evaluation to long term future resource planning and financing. Verification of yearly financial need realistic inputs from the field units. Sound financial plans thus minimize the chances of unusual surrender of allocations or extraordinary shortfalls to meet yearly requirements. The available surplus reserve with higher institutions can be committed at required places. Mechanism thus evolved serves for linking organizational performance with national strategic goals. In contingency scenario, real time information on defense resources and committal of reserves remains critical for operational goals.

3.13 Who Can Assist in e Dashboard Preparation and KPIs Optimization?

Chief Information Officer (CIO) is kept directly under Chief Executive Officer (CEO) of the organization due to the importance and use of Key performance indicators and their projection for review in meetings. Statistics expert and Economist can be used for structural format, templates preparation and to rationally decide the limiting bars based upon the empirical formulas. The reference Bars need periodic review for changing parameters in condition of un-certainty to have variety of optimistic and pessimistic evaluations for decision making.

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

3.14 Expectations from Executives & Managers: Age of Information Overload

Statistical understanding has evolved after the IT advent in defense organizations. The knowhow of Executives and Managers has come a long way from worksheets provided by software like Lotus Series. Further refinement is provided by latest flexibility offered of MS Excel etc and available peripheral hardware interface. Executives and Mid-Level managers need to be conversant with the available features like Pivot Charts and hone their skills for imaginative orientation of display of their choice of assimilation at a glance. To accomplish such Dashboard views and evolve further is the job of IT engineers. However, it is seen that real difference is created by the interest of the end user. Quick analysis of organizational performance, contemporary info-graphics at open source media like Google Analytics are becoming hobby tools

4 Conclusion

Accurate data process and trend formulation have become necessary traits in the age of digital competition. Ability to do it accurately and faster than the adversary is the key to survival in combat environment. The analytical leverage offered by such features needs to be harnessed by military supervisors for efficient management of Defense Resources. It is essential to keep the field formations in action ready state with real time access to data in the age of information overflow. The differential edge requires conversion of conventional hard format data offices to digital archiving Analysis Cells. The Field supervisors and executives need to be excelling in imaginative skills to grasp logically prepared tables and graphical perspectives. User friendly Dashboard portals and templates are easy to be formulated, provided active participation takes place by the end user. Constant evolution can result in quick assessment of organizational key performance indicators (KPIs). This can help to timely steer the organization for austerity and efficiency at the same time. Lateral dividends are linked with accurate feedback for large scale financial projection and rationale commitment or diversion of financial resources. The job of Statistical Experts and Economists is to provide reference bars and data iteration for volatile and non-definite areas of performance. This has also immense potential to reduce fog and friction in operational theaters and areas of active engagement / battle zones.

Excluding Title, Index, Abstract & References

DISCLAIMER: The Information produced in the Paper on KPIs & Dashboard for Defense Recourse Management is based upon corporate experience and being a witness to IT revolution since school age 1980s till now. Intuitive perspectives were acquired being at DRESMARA by conducting learning environment provided by Faculty Staff. The numeric figures are arbitrary. Reader should improvise as per custom requirements in addition to local best practices and procedures in vogue.

KEY PERFORMANCE INDICATORS (KPIs) THEIR IMPORTANCE AND USE IN EVALUATION PHASE A DASHBOARD APPROACH FOR DEFENSE RESOURCES

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