

EFFICIENT STORE OPERATIONS THROUGH KPI FRAMEWORK

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Abstract: Key Performance Indicators or more simply KPI are used for measuring the performance of critical parameters of operations. The case presents the KPI parameter framework for measuring the operational efficiency of a Supermarket. The measurement and publication of Operational weekly routines forms an important review mechanism for establishing operational consistency in a chain supermarket. The proposed KPI model for the organized retail sector is based on the measured weekly data on store routines of a grocery chain of supermarkets for 15 stores over a period of 8 weeks. Use of DMAIC (Define, Measure, Analyze, Improve, Control) model in sustaining the improvements is also demonstrated.

The paper also compares two clusters of Supermarket groups for operational routine adherence and provides insights on improving customer service through better availability and consistent store operations leading to improved profitability.

Keywords: KPI, Key Performance Indicators, Grocery Supermarket operations, retail store performance parameters, Work plan routines, store operations improvement, store routines, DMAIC model, Cause effect Matrix.

1. **Introduction:** The present retail store operations is very complicated, due to constraints in cost cutting and achieving tough sales targets. Several brick-and-mortar stores are struggling to provide good customer services at reduced cost. The KPI measures of store operations can help achieve efficient store operations at nominal costs and can result in increased productivity.

2. Literature Review:

2.1 KPI: Key performance Indicators:

The majority of grocery chain of supermarkets of

India are not profitable, due to low sales and higher overheads.

In past when the competition was minimum, organizations applied simple information system to analyze limited data, however present scenario is completely opposite to the past as managers need to analyze mammoth data and take quick decisions in order to be efficient and lean.- As per Dinesh Kumar U (2017) in his book on 'Business Analytics'¹ KPIs are critical in today's businesses.

Retail experts have predicted better Operational controls for operational efficiency and consistent store Operations through planned weekly Work Plan.

KPIs provide small business owners with an

immediate snapshot of the overall performance of their business. The small business owner should measure and track the key performance indicators crucial to the success of his organization. These important KPIs provide vital decision-making information- *as per, Sahil Raj-in his book "Business Analytics", Key Performance indicators* ²

Retail store KPI's are designed to measure and take corrective actions on the parameters affecting:

1. Operations
2. Productivity
3. Sales
4. Supply Chain

So that store profitability can be improved. Tyagi Neha says "as the retail sector goes through turbulent changes due to Online competition, Laws on taxation due to GST changeover, Demonetization, Plastic Ban for packaging, Customer preferences, Lifestyle changes, Increased customer awareness on healthy living the organizations needs to constantly evaluate and take corrective actions to counter the dynamic forces of changes."⁵

The design of Key performance Indicators pertaining to critical business parameter is paramount in KPI measurement.

How do you establish key performance indicators? --
<https://unilytics.com/5-steps-to-actionable-key-performance-indicators/>⁴

Online competition to small supermarkets has been well described by Ratna B and Mukherjee W (2017), in the article 'At Amazon, Groceries and Food to come with Big Discounts'⁶

Ultimately, the usage of KPIs should lead to changes that improve the performance and efficiency of the store. There is no point putting so much effort identifying KPIs and measuring them if the data is not going to be put to good use. If there is a pattern arising in out-of-stock items, such as one particular item being out-of-stock with a higher than expected frequency, then it is time to increase the frequency or amount by which the item is restocked. This is published in online article -
<https://yourbusiness.azcentral.com/kpi-retail-store-22371.html>³

Several Industry experts in Retail believe that

adherence to Store routines can go a long way to make store efficient and lead to higher customer satisfaction.

2.2 DMAIC Process:

In their Research paper 'Six sigma DMAIC Literature Review'⁷ Prof. Jadhav G, Prof. Jadhav S and Prof. Bhagat has stated that DMAIC processes (Define, Measure, Analyze, Improve, Control) helps in first measuring the existing parameters then taking corrective steps when certain processes fall below specified levels. This leads to improvement in overall quality of the processes leading to product and services improvements to the customers.

In their research paper titled 'The Application of DMAIC to improve Product'⁸ Prof. Mohamad, Prof. Lazi, Prof. Ahmed and Prof. Seng states that DMAIC is an initiative for continuous process and product improvement. DMAIC can help solve complicated business problems using simple techniques.

3. Research Methodology:

Many stores follow weekly work Plan where critical store activities like Fresh departments stock takes, Inventory corrections etc. are conducted week on week. We selected a chain of popular Superstores and Supermarkets in South India in the state of Tamil Nadu for studying the weekly Store Routine adherences.

3.1 Study parameters:

- Superstores: 3; Average Area 40,000 Sq.ft. (3610 sq.m)
- Supermarkets: 12; Average Area 7,000 Sq.ft. (630 sq.m)
- Study duration: 8 Weeks; Week17 (22nd July 2019) to Week24 (6th Sep. 2019)

The SAP data on various Weekly routines was collected for a period of 8 weeks (from Week17 to Week24). The SAP data logger reports on the activities routine plan as per following grading plan has been utilized:

Day Of the week	Work Plan activity	Verification source	Grading system 1= 11.11%
Monday	Cash office and back office Process checks	SAP entries, Bank slips	Adherence= 1 Non-Adherence= 0
Monday	Stock take- Fruits and Vegetables	SAP entries, Inventory	Adherence= 1

		correction records	Non-Adherence= 0
Mon,Tues, Friday	Items not on shelf	GRN details, SAP Inventory records	One day Adherence= 1 Non-Adherence= 0
Tuesday	Consumables counting and Stock corrections	SAP entries	Adherence= 1 Non-Adherence= 0
Tuesday	Staples- critical stock counts	SAP entries, Inventory correction records	Adherence= 1 Non-Adherence= 0
Wednesday	Dairy& Frozen critical stock counts	SAP entries, Inventory correction records	Adherence= 1 Non-Adherence= 0
Wednesday	Bakery critical stock counts	SAP entries, Inventory correction records	Adherence= 1 Non-Adherence= 0
Thursday	Pest Control checklist	Checklist collated file	Adherence= 1 Non-Adherence= 0
Sunday	Stock take- Meats and Fish	SAP entries, Inventory correction records	Adherence= 1 Non-Adherence= 0

3.2 Based on the above a Store KPI template was designed:

Name	KPI description
Store routine Adherence	Work Plan adherence
Measurable action	Measure daily routines and grade them.
Inputs	Collect SAP data and physical records from all stores and apply grading.
Outputs	<ol style="list-style-type: none"> 1. Storewise Trend lines for data mining insights 2. Identifying the laggards 3. Identify the Training and development needs at such stores.

3.3 PROPOSED DMAIC MODEL FOR IMPROVEMENT IN STORE OPERATIONS

DMAIC MODEL :

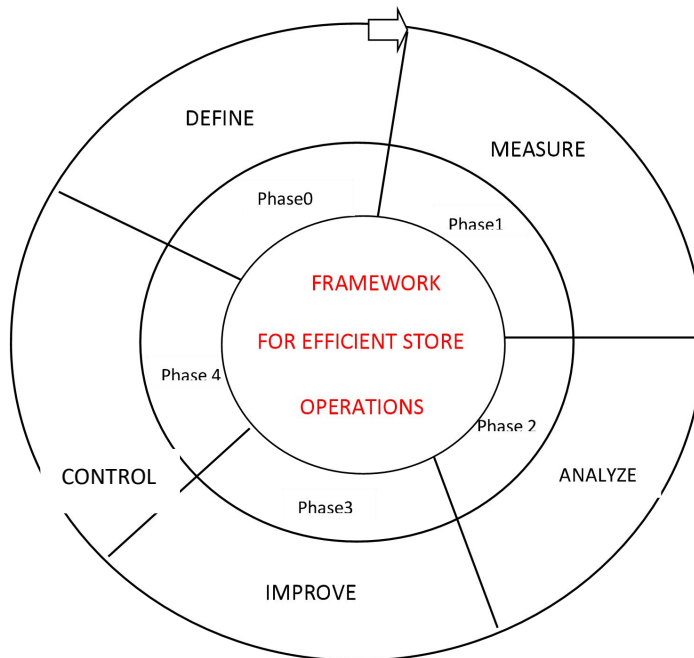


Fig. 5 DMAIC MODEL

TABLE 2:

PHASE NO.	NAME	PARAMETERS
0	DEFINE	<ol style="list-style-type: none"> Scope: Superstores: 3 Supermarkets 12 Duration 8 weeks Geographical reach: Tamilnadu State Region 1: 6 Supermarkets Region 2: 6 Supermarkets
1	MEASURE	<ol style="list-style-type: none"> Storewise % Weekly Work plan adherence Mapping of processes and identifying Inputs and Outputs Develop standard, expected and grading plan Monitor SAP dashboard Convert adherence data to % adherence
2	ANALYZE	<ol style="list-style-type: none"> Compare storewise means of weekly % adherences Plot regionwide, storewise weekly Line graphs for 8 weeks Compare with standard and expected performances Develop Input and Output relationship Tabulate observations
3	IMPROVE	<ol style="list-style-type: none"> Identify weaker stores. Formulate improvement plans. Provide resources Establish ongoing improvement measures.
4	CONTROL	<ol style="list-style-type: none"> Continue monitoring all stores weekly. Present KPI to Ops Director, AM and RM's weekly Share improvement plans and identify monitoring means Raise standards after satisfactory improvement.

4. Objectives of the study:

1. To understand the routine adherences across Superstores and Supermarkets.
2. To understand the constraints routine adherence due to lesser resources at Supermarkets
3. To understand importance of training and development for efficient store operations.
4. To identify weaker stores on store routines and support them for improving store

- routines.
5. To highlight to management the underperforming stores and relating it to store profitability and lower sales.

6. Study the effect of POOR WORK PLAN ADHERANCE CAUSE EFFECT MATRIX:

As follows **TABLE 3:**

LOW SCORES ON ROUTINE	CAUSE	EFFECT	Effect on other functions
Cash office Routine	Staff training, Sales System SAP error	In accurate banking, non-reconciliation, cash shortages.	Sales and Banking discrepancies, GST tax returns delays
Item not on Shelves	Staff training, Scanner malfunctioning	Poor stock supply, low availability, sales loss	Increase in warehouse stock, Delays in stock picking
FnV stock take	Weighing scale malfunctioning, GRN's not completed	Incorrect system inventory, obstacle to automatic ordering	Delays in vendor payment, margin loss
Staples critical count	Weighing scale malfunctioning, Scanner malfunctioning	Poor stock supply, low availability, sales loss	Increase in warehouse stock, Delays in stock picking from Warehouse

4.1 FRAMEWORK FOR MEASURING WEEKLY WORKPLAN KPI:

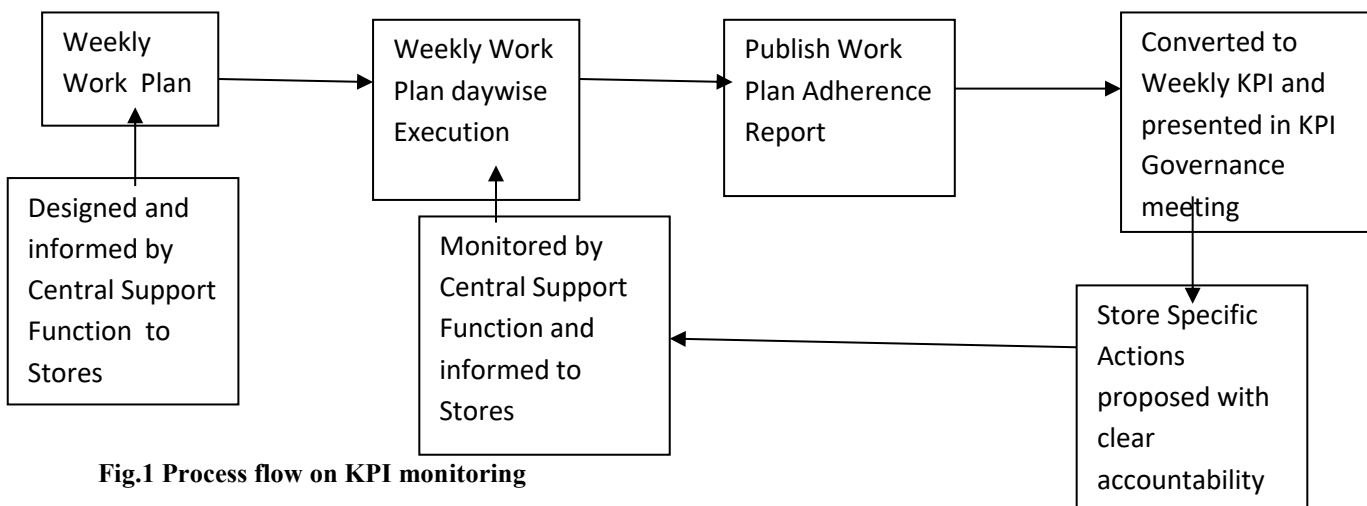


Fig.1 Process flow on KPI monitoring

5. DATA INTERPRETATION:

Table 1: Work Plan adherence – REGION1 - Week 24

Super Store	Cash Office Checks	Pest control	Items Not on Shelf	Dairy & Frozen Counts	Bakery Stock Take	Meats & Fish Stock Take	F&V Stock Take	Staples Critical Lines count	Consumables Counting	Weekly Plan Adherence (%)
SS01	1	1	1	1	1	1	1	1	1	100%
SS02	1	1	1	1	1	1	1	1	1	100%
SS03	1	1	1	1	1	1	1	1	1	100%
Supers stores										100%

Supermarkets	Cash Office Checks	Pest control	Items Not on Shelf	Dairy & Frozen Counts	Bakery Stock Take	Meats & Fish Stock Take	F&V Stock Take	Staples Critical Lines count	Consumables Counting	Weekly Plan Adherence (%)
SM01	1	1	1	1	1	1	1	1	1	100%
SM02	1	1	1	1	1	1	1	1	1	100%
SM03	1	1	0	1	0	1	1	1	1	78%
SM05	1	1	0	1	1	1	1	1	1	89%
SM06	1	1	0	1	1	1	1	1	1	89%
SM07	1	1	1	1	1	1	1	1	1	100%
SM08	1	1	1	1	1	1	1	1	1	100%
SM09	1	1	1	0	1	1	1	0	1	78%
SM10	1	1	0	1	1	1	1	1	1	89%
SM11	1	1	0	1	1	1	1	1	1	89%
SM12	1	1	1	1	1	1	1	1	1	100%
SM13	1	1	1	1	1	1	1	1	1	100%
Supermarkets										93%

The above template was made and all data from week 17 to week 24 was analyzed and graded in this manner for all the 15 stores.

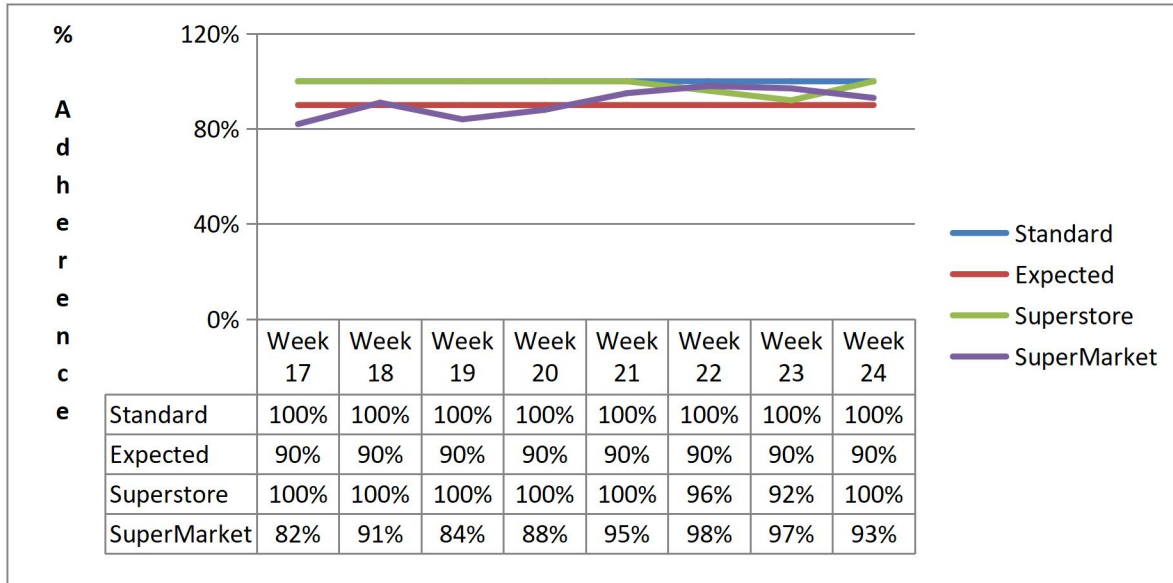
The individual stores Work Plan adherence was then converted in to %Adherence on a grading scale of 0-100%.

Week wise scores were tabulated and each was

graded for operational efficiency against a standard of full compliance (100%) and Expected compliance of 90%.

6. DATA ANALYSIS:

6.1 Summary of Superstore v/s Supermarkets on Operational Work Plan adherence was presented as follows: Fig 2:



6.2 Observations:

- Standard performance of 100% achieved by Superstores in 75% of study week.
- Expected performance of 90% achieved by Supermarkets in 62,5% of study week.

I. Supermarket stores were divided in to two clusters – Region1 and Region2:

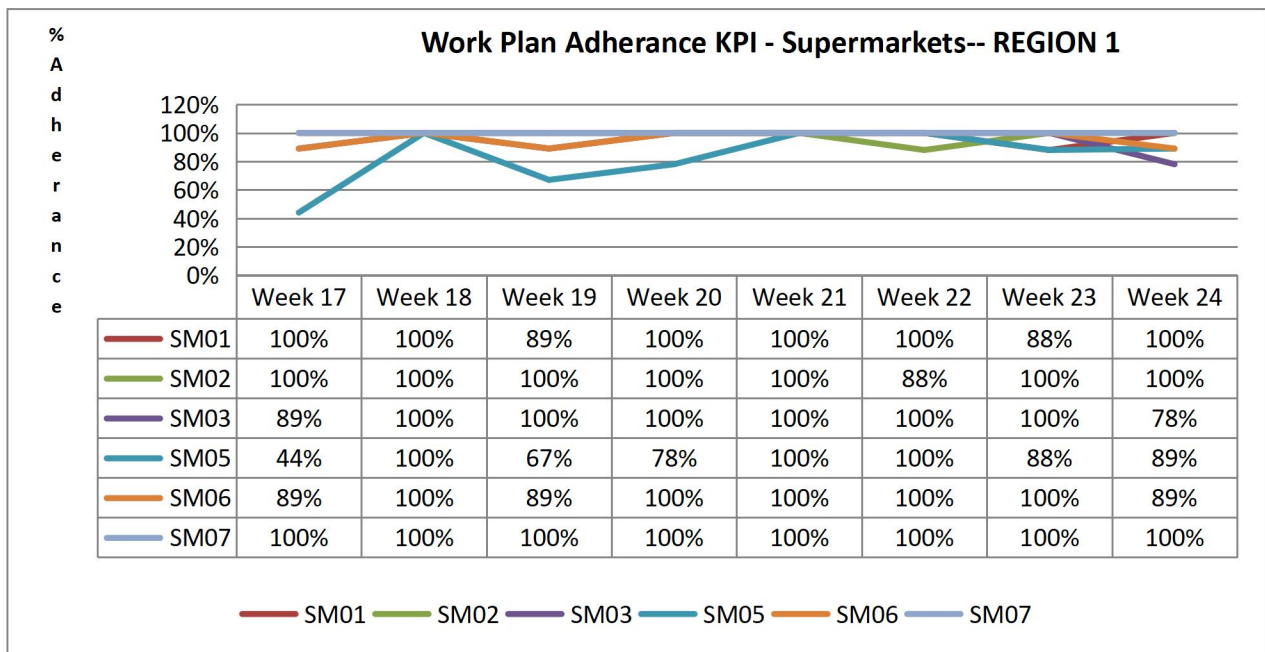


Fig. 3. Workplan routine adherence for Cluster-- Super Market- Region 1

6.3 Observations:

- Standard performance of 100% achieved by 1 Supermarket (SM07) in all weeks.
- Expected performance of 90% and above was achieved by remaining all Supermarkets in 77% of instances of study week.

Super Market- Region 2

Observations:

- Standard performance of 100% achieved by 1 Supermarkets (SM12) in all weeks.
- Expected performance of 90% and above was achieved by all Supermarkets in 52% of instances of study week.

6.4 Workplan routine adherence for Cluster--

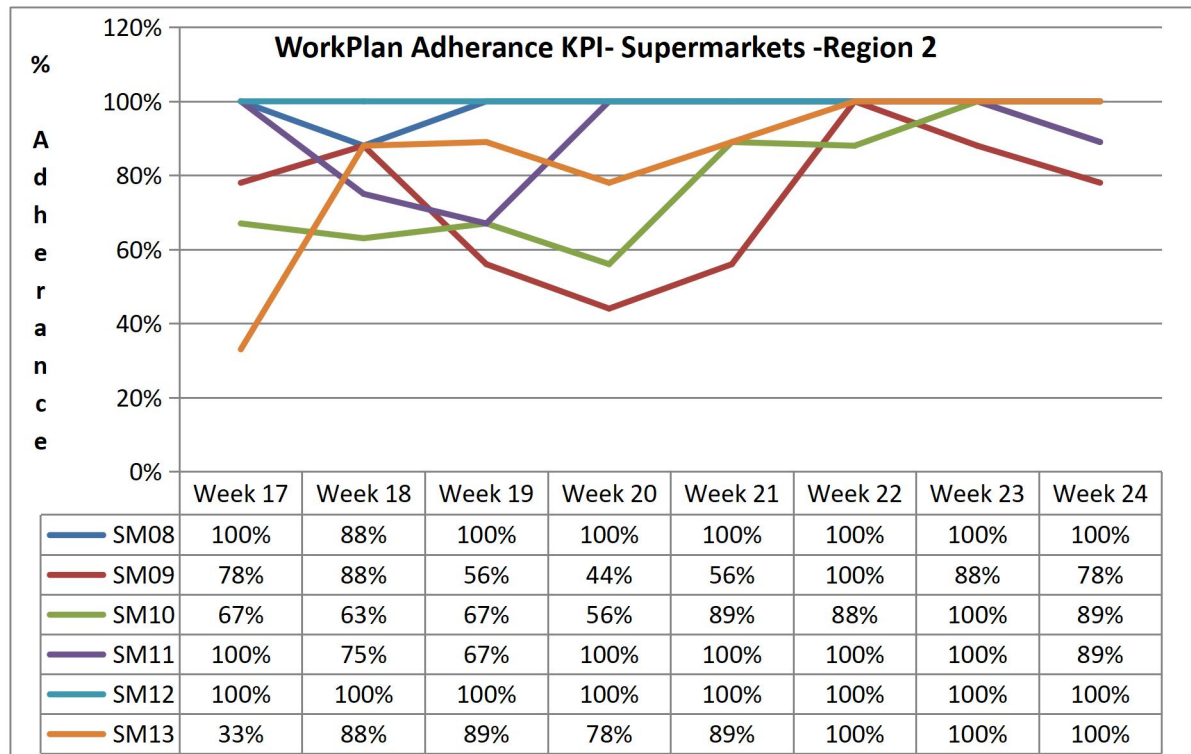
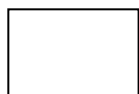


Fig. 4. Workplan routine adherence for Supermarket Cluster-- Region 2

6.5 FRAMEWORK FOR MEASURING WEEKLY WORKPLAN KPI with DELIVERABLES:



Model framework



Deliverables

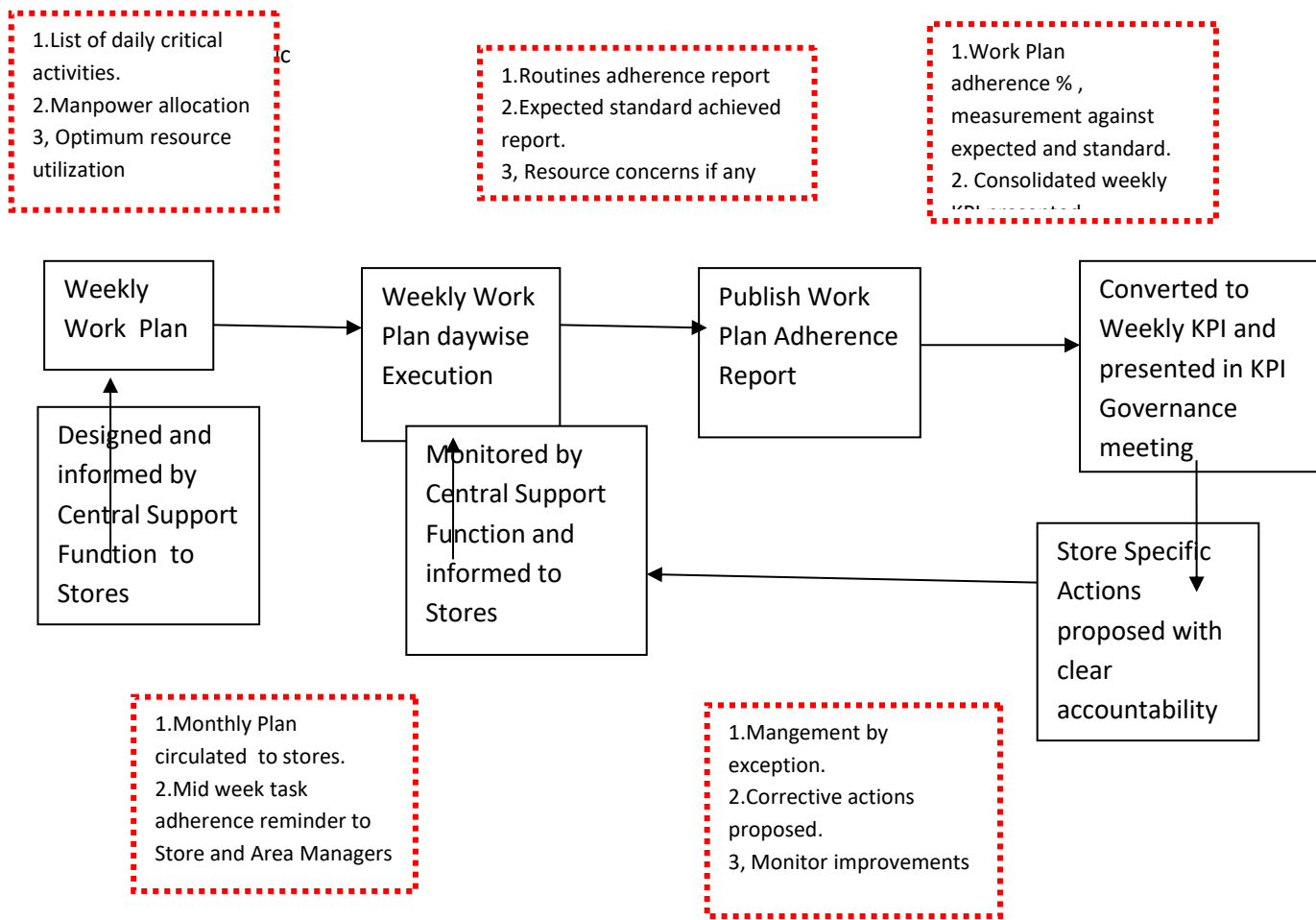


Fig. 6 Process flow on KPI monitoring with deliverables

. 7. Findings and Conclusions:

1. The South regions Superstore are operationally efficient, scoring Standard of 100% on 6 of 8 weeks of observation. This indicates good control on all Work Plan routines and excellent inventory control leading to better sales and lower Cost to Sales ratio.
2. The Cluster Region 2 is poor in work Plan adherence and several peaks and valleys indicate inconsistent operations in a majority of stores.
3. The lower than expected Work Plan adherence for stores SM09 and SM10 indicates poor attention to Weekly routines and may need additional marketing efforts to achieve budgeted sales.
4. The Customer service at SM09 and SM10 will also be poor as stocks availability would be poor as several stock related routines and inventory corrections resulting out of these work plan routines would not have happened. Lack of Training to new recruits was found to be a major factor for non-compliance.
5. Overall Region 1 cluster stores have consistently performed well on Work plan routine.
6. SM05 have improved work plan compliance from week 17. However corrective action in terms of monitoring consistently is needed. Some technical equipment failures were identified for inconsistent adherence and a backup device

can help.

8. Suggested further studies: Based on the above grading model, the following Store KPI's can be studied:

1. Weekly stock loss
2. Weekly Operational Expenses
3. Weekly Electrical consumption
4. Weekly Cash till billing time
5. Weekly Health and safety Audit scores
6. Weekly Food safety and Quality audit (FSQA) scores.

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