

Developing Effective Progress Reports

Progress Measurement and Reporting

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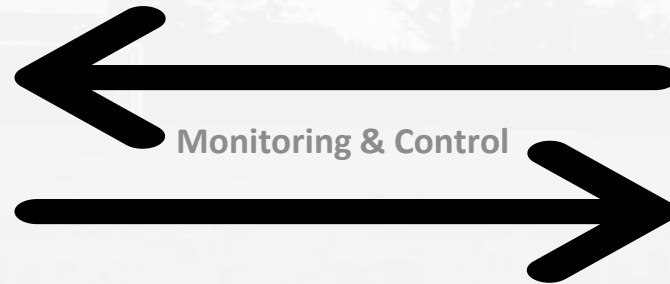
Content

- Introduction
- Progress and Value
- Schedule Management
- Data Management
- KPIs and Dashboards

Reporting Purpose

Levels of Reports and Effective Communication

Purpose of Progress Reporting



Knowledge is Power

Decision Making



Levels of Progress Reports

Level 1 - Executive Summary Level (Dashboard, Flash report):

overall project progress/ planned and forecast, rate: monthly, quarterly.

Level 2 - Summary Level (Client Presentation):

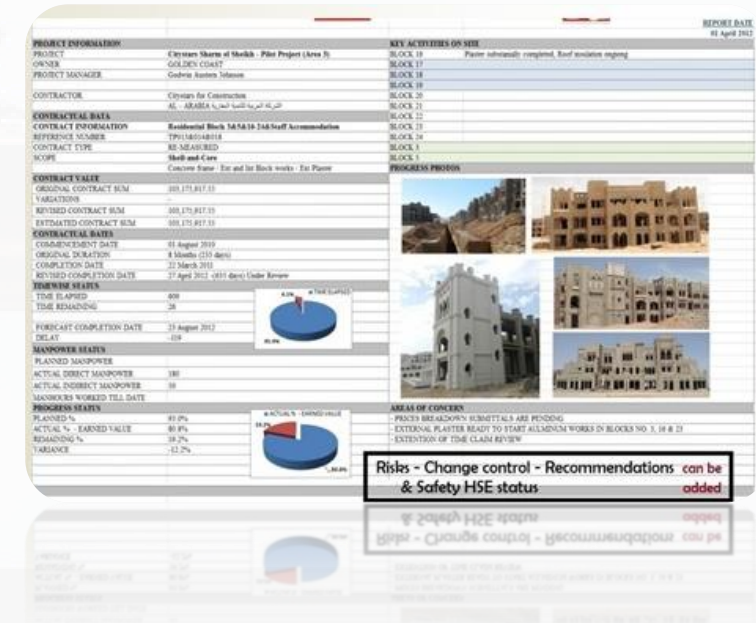
Status reports include major trades and areas of concern, rate: monthly, fortnightly.

Level 3 - Management Level:

Represent the work sequence and programme, in detail sufficient to plan and monitor weekly activities at the contractor working level, 'look ahead programmes', rate: weekly, biweekly.

Level 4 - Site Level (Daily):

The daily progress log or tick-sheets, which e developed and maintained by each department, section or trade.



Effective Communication

7Cs:

- Clear
- Concise
- Concrete
- Correct
- Coherent
- Complete
- Courteous

Though there are a few variations. You can use the 7 Cs as a checklist in your written and spoken messages.



Progress and Value

Measurement and Monitoring

Progress and Value



PMS against weightage

Benefits and Functionality



Progress Measurement Basis

PMS Basis (Consuming Time vs Cost vs Effort)

Mobilization, Engineering, Procurement, Construction and Close-out duration/cost/manhours

Duration Weights:

- Timewise, activity takes more time deserves more proportional weight.

But:

- An activity can take long duration without much cost or resources required as a shorter activity may need.

Cost Weights:

- Resources are loaded as per payments because cash flow is key in progress.

But:

- An expensive activity may reflect a sudden high progress while the project is not ahead of schedule.


Manhours Weights:

Manhours address the required effort to execute any activity and it's more indicative for progress **While** this neglects the other resources & the difference between payments and progress makes confusion.

Rules of Credit

Rules of Credit – Incremental Milestones

The following describes five common physical progress methods for measuring the extent of completion of the scope of a work package:

1. Units Completed
2. Incremental Milestone 
3. Weighted or Equivalent Units Completed
4. Resource Expenditure (Level of Effort)
5. Judgment

Milestone	Activity	Weight
Complete Preliminary Drawing	Initial template for an engineering drawing or specification is complete	10%
Internal Review (Squad Check)	Complete internal discipline checks	20%
Issue for Owner Approval	Complete to a stage enough to issue to the owner	30%
Approved (with Holds)	Based on feedback from the owner, issue the drawing with holds	20%
Approved for Construction (AFC) – No Holds	Issue drawing without holds	10%
All Revisions Complete	Drawing complete as built	10%
Total		100%

TABLE 2 Typical Engineering Methods of Measure

Standard methods of measure for construction vary widely depending on the nature of the work and the number of steps.

Progress Measurement

Applying Weightages on the Programme with Rules of Credit

Org. Maturity in PM and Quantity based activities vs Engineering and procurement progress

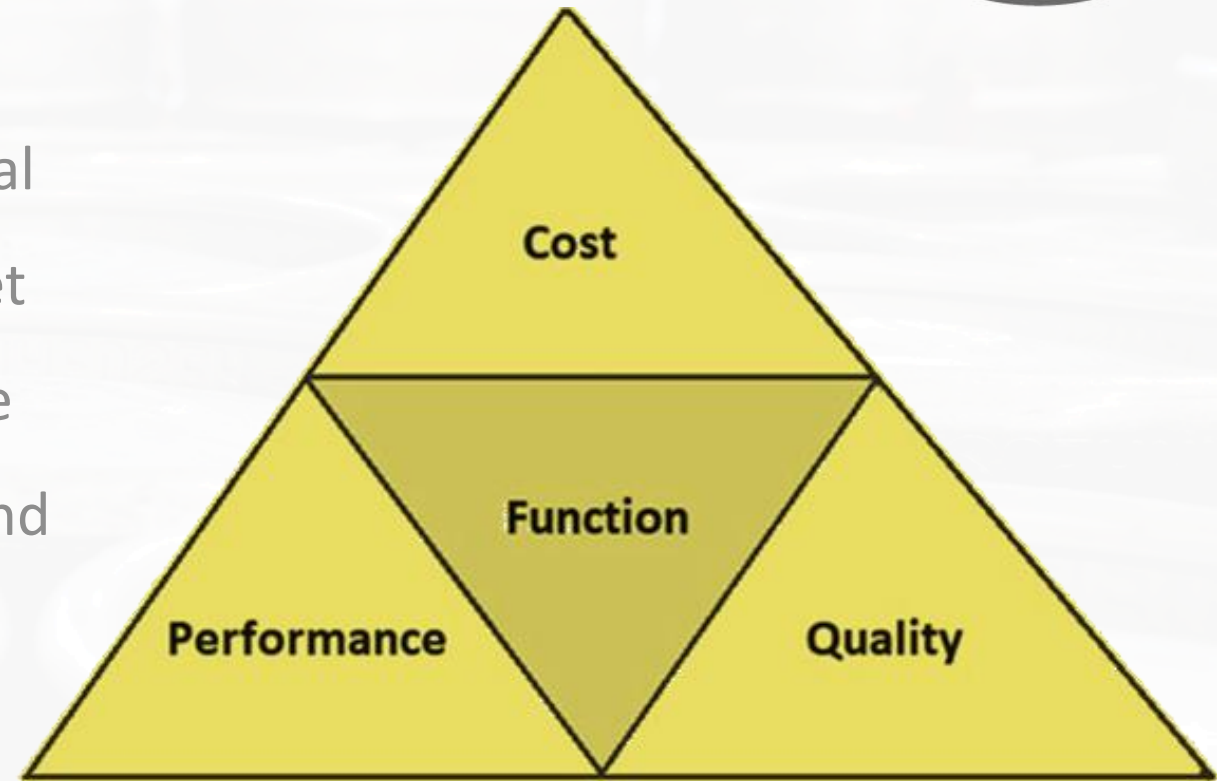
Example for a Construction Project JIT:

Phase	Weight	
Mobilization	2%	→ Break down between physical Mobilization and Early submissions
Engineering Submission/Approval 60/40%	10%	→ Break down by no. between all types of submissions and approvals (resubmission issue)
Procurement	3%	
Prequalification	10%	→ Break down between submissions and approval 60/40% (resubmission issue= e.g. 20%)
Material Submission/Approval	20%	
PO	20%	→ 0/100 activities based on the issuance of the purchase orders
Delivery	50%	→ Does this includes the manufacturing and how will it be measured or to split for long-lead items
Construction	80%	→ Break down based on the productivity sheet and manhours assigned to each activity (Qty credit)
Close-Out	5%	→ Break down between physical demobilization, snag/de-snagging and documents submissions

Value Management

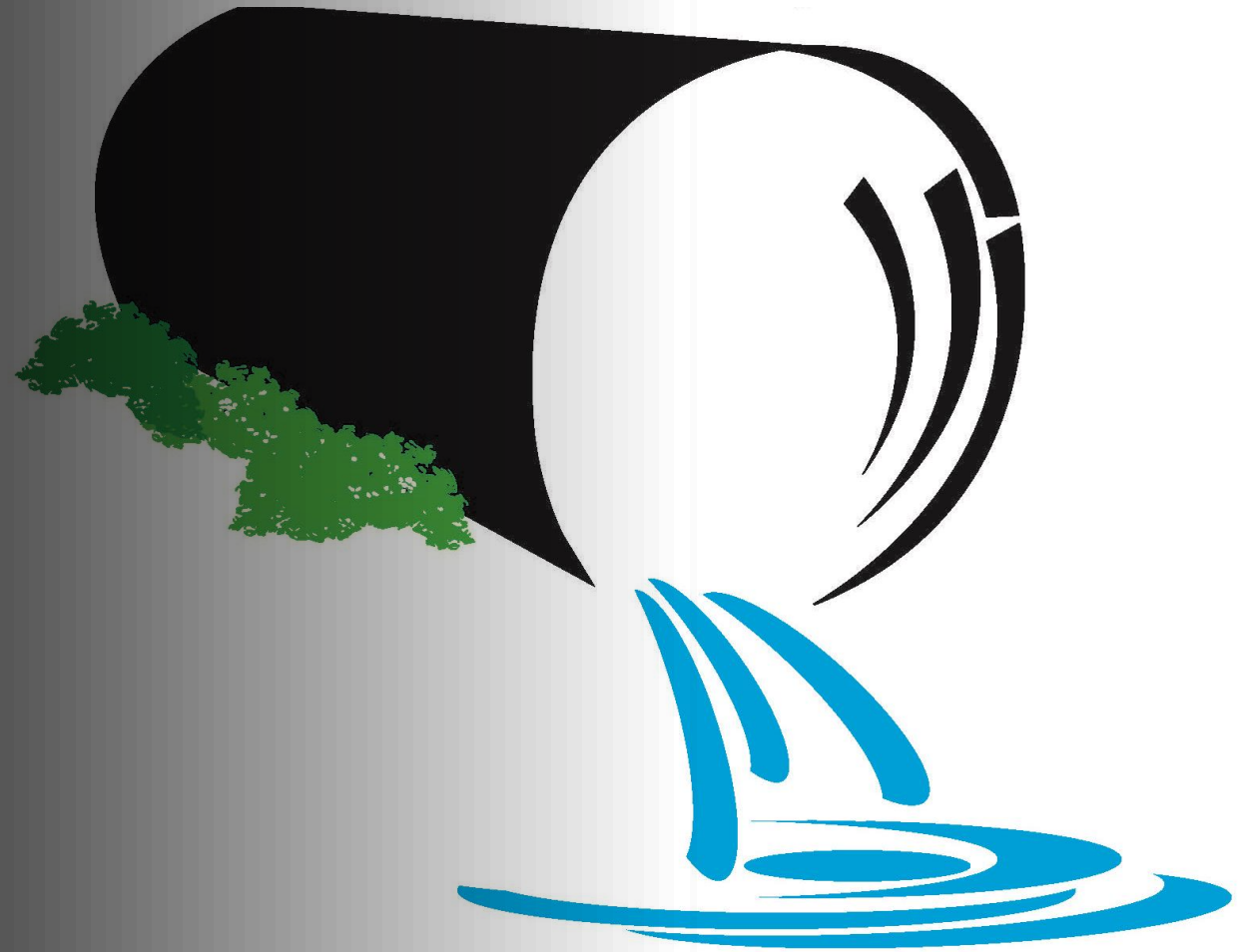
Objective

The objective of VM is to minimize the capital and operating costs associated with the asset or function delivered by a project, within the required quality, performance and timing, and satisfying safety, environmental and project approval constraints.





Case Study #1 – Progress and Value Reporting



Why Monitoring Value?

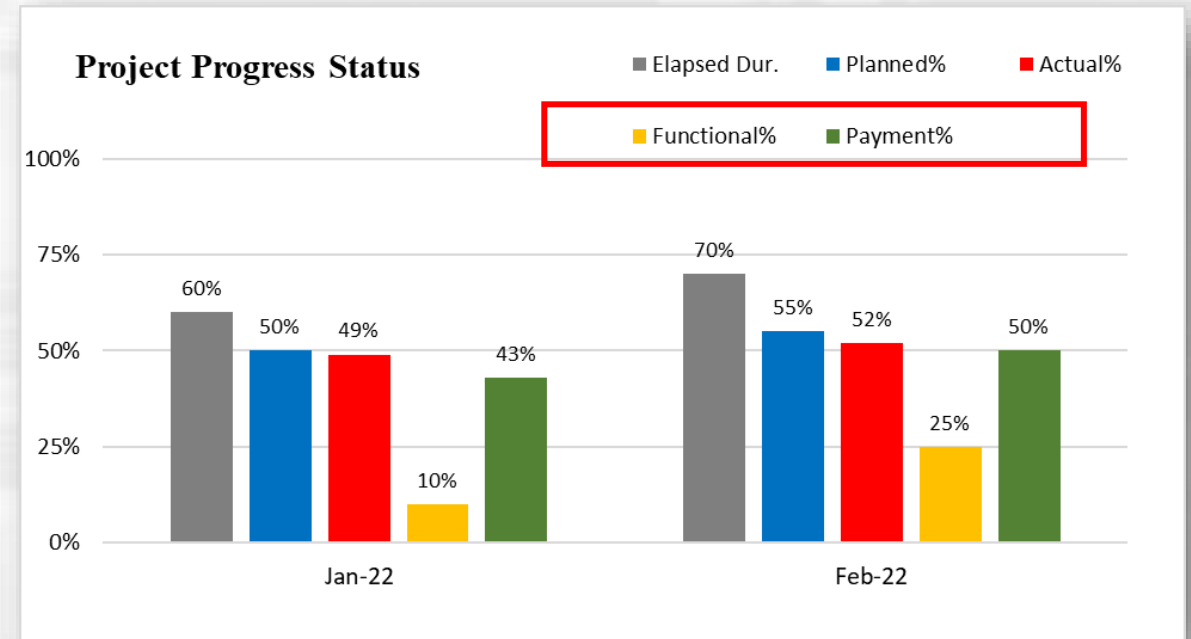
It was a challenge that to manage the **frontloading** by contractors working on the high price and profitable items regardless of completing certain areas to make the project **functional**.

In such a case, projects were achieving high progress percentages, but the work was **scattered** without adding value. In case of **termination**, completing the remaining works by another contractor would be difficult, complicated, and costly.



Reporting Progress and Functionality

Therefore, it was essential to add a **parameter to the cost control reports** to measure the **functionality** of the project based on continuity and connectivity, and to monitor this parameter on a regular basis against the progress as illustrated in this chart with a **direct link to payments** and cash flow.

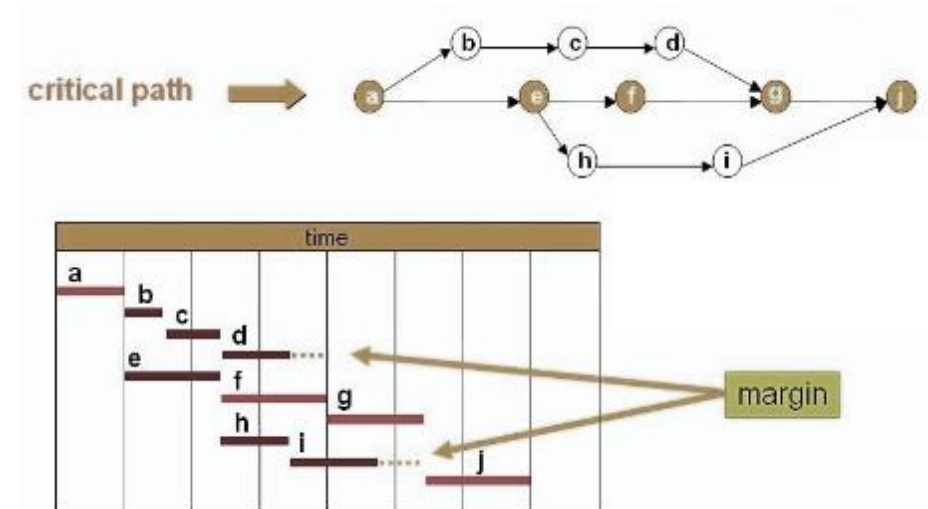


Schedule Management

Delay Quantification Approaches

Planning and Scheduling

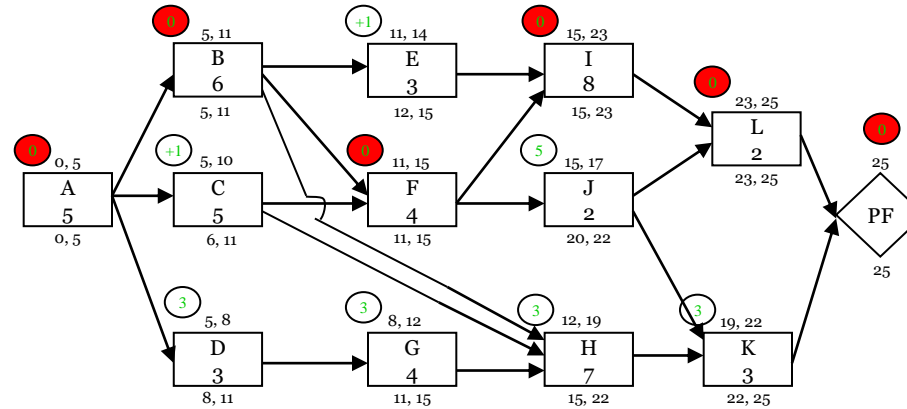
- CPM: Critical path method is sequencing of scheduled activities to determine **the minimum duration** of a project. It uses **forward and backward calculations**.
- Critical path is the longest sequence of tasks in a project plan that must be completed on time (with no margin/ float) in order to meet the project deadline.
- If there is a **delay** in **any task on the critical path**, then your whole project will be delayed.
- Although some projects** have only **one critical path**, other projects may have **multiple** critical paths.



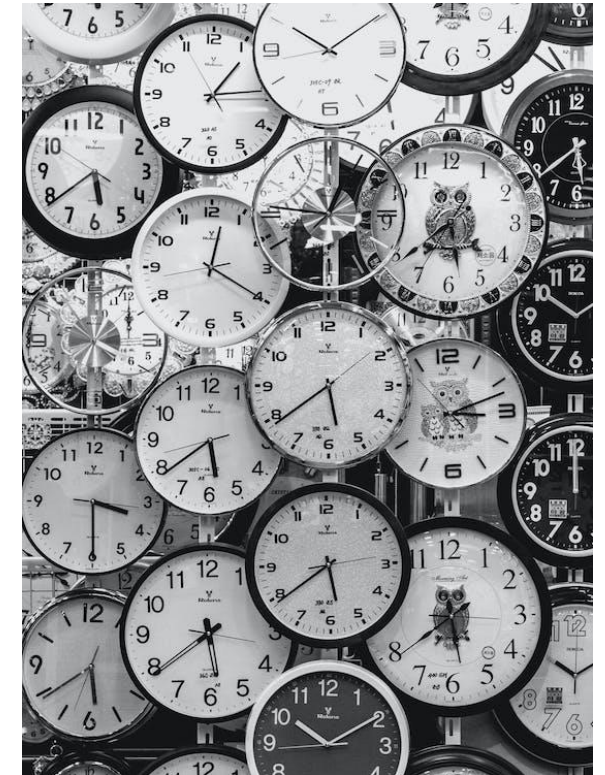
Schedule Forecasting

Delay is the negative TF

Total Float = Update Finish date –
Baseline Finish date

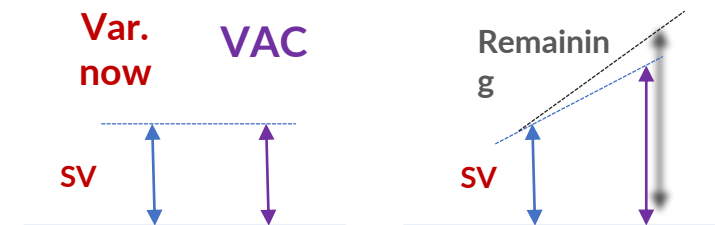


SCL Delay and Disruption Protocol added 11.7 **Other methods**, which may be reasonably deployed in **particular circumstances** ..., include: ... time chainage analysis, **line of balance** analysis, resource curve analysis, and **earned value** analysis.

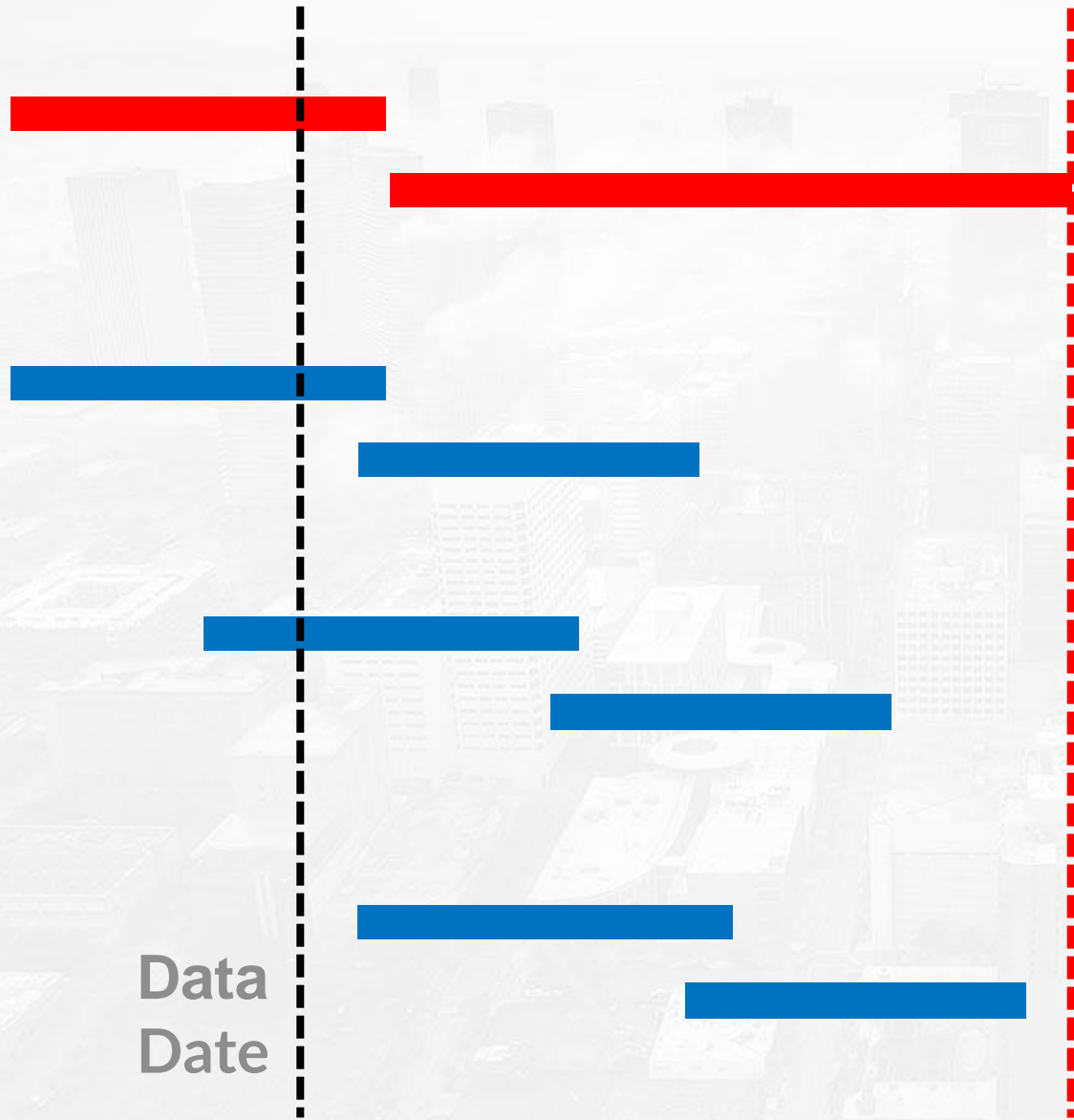


Forecasting Approaches

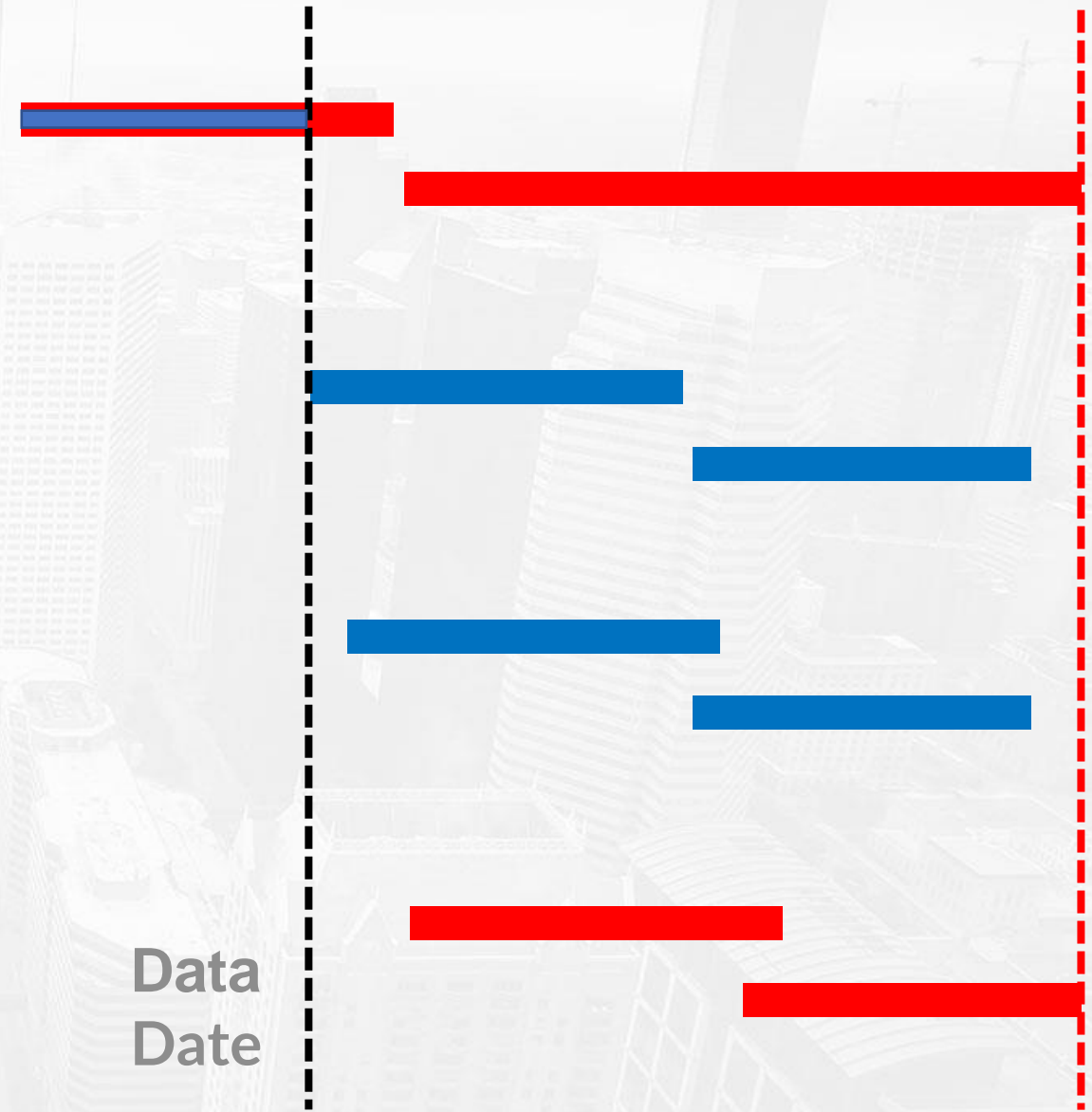
- 1 **Total Float** = Update Finish date – Baseline Finish date (Delay = -ve TF)
- 2 **LOB** (Repetitive activities): Resource-based schedules
Apply the resource limits (Leveling) and logic productivity on the remaining work
- 3 **SV** = EV – PV, $EV = \sum(\text{Performance}\% * BC)$, $PV = \sum(\text{Scheduled}\% * BC)$
-ve SV: Delay = SV / Daily planned budget (BAC/Duration)
- 4 **Earned Schedule**: $SPI = PT/AT$ (SPI < 1 means behind schedule: Delay)
SV: Delay = AT – PT, PT = The planned (earned) duration of the EV
- 5 **Trend analysis** (Forecasting): Extending the curve of EV
Delay = Expected Finish date – Baseline Finish date
- 6 **EVM Forecasting**: 3 approaches
 - 1- Maintain the variance till end.
 - 2- Magnify the variance.
 - 3- Recalculation for the remaining work to consider all factors.



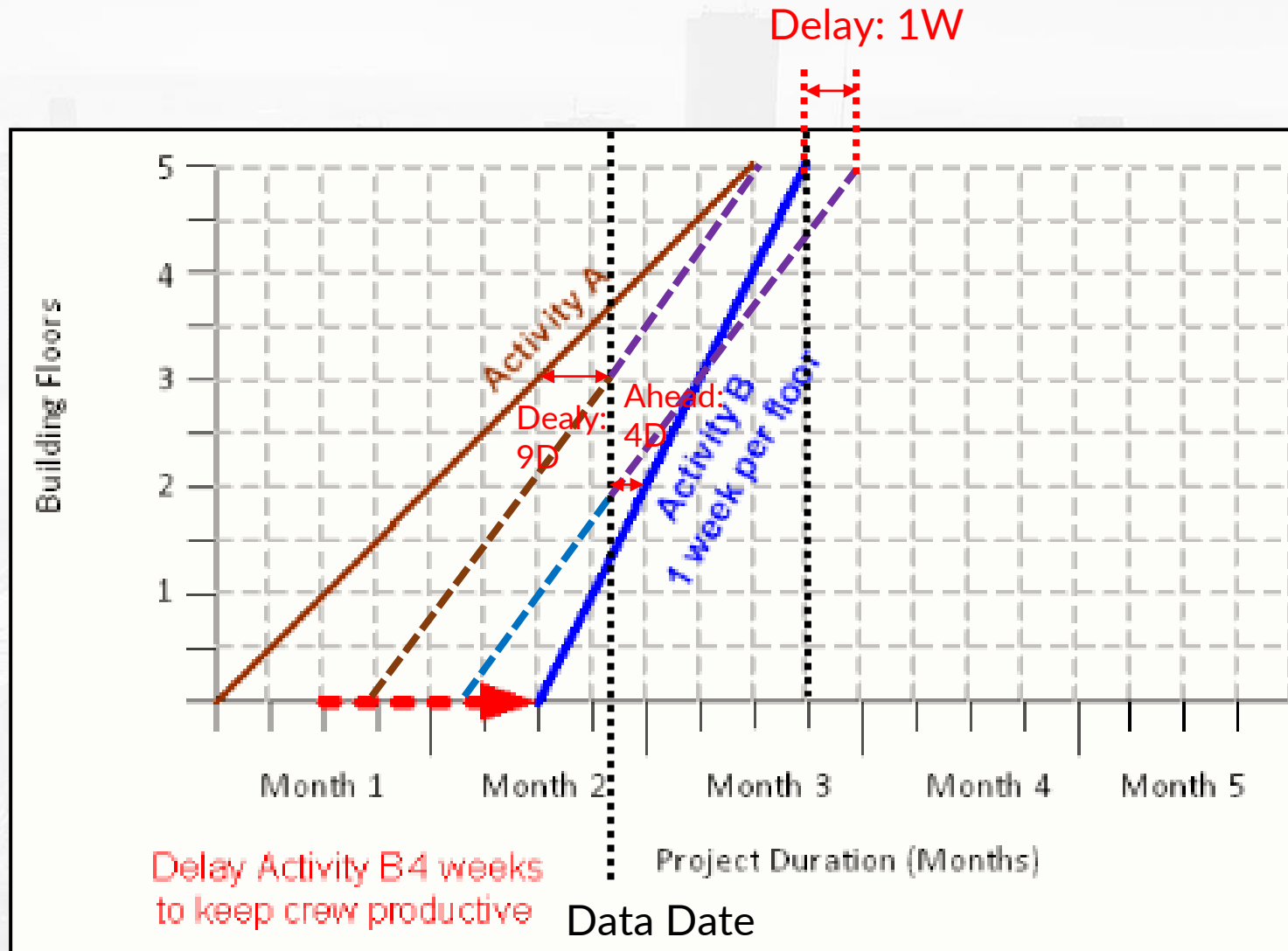
Baseline (TF=0)



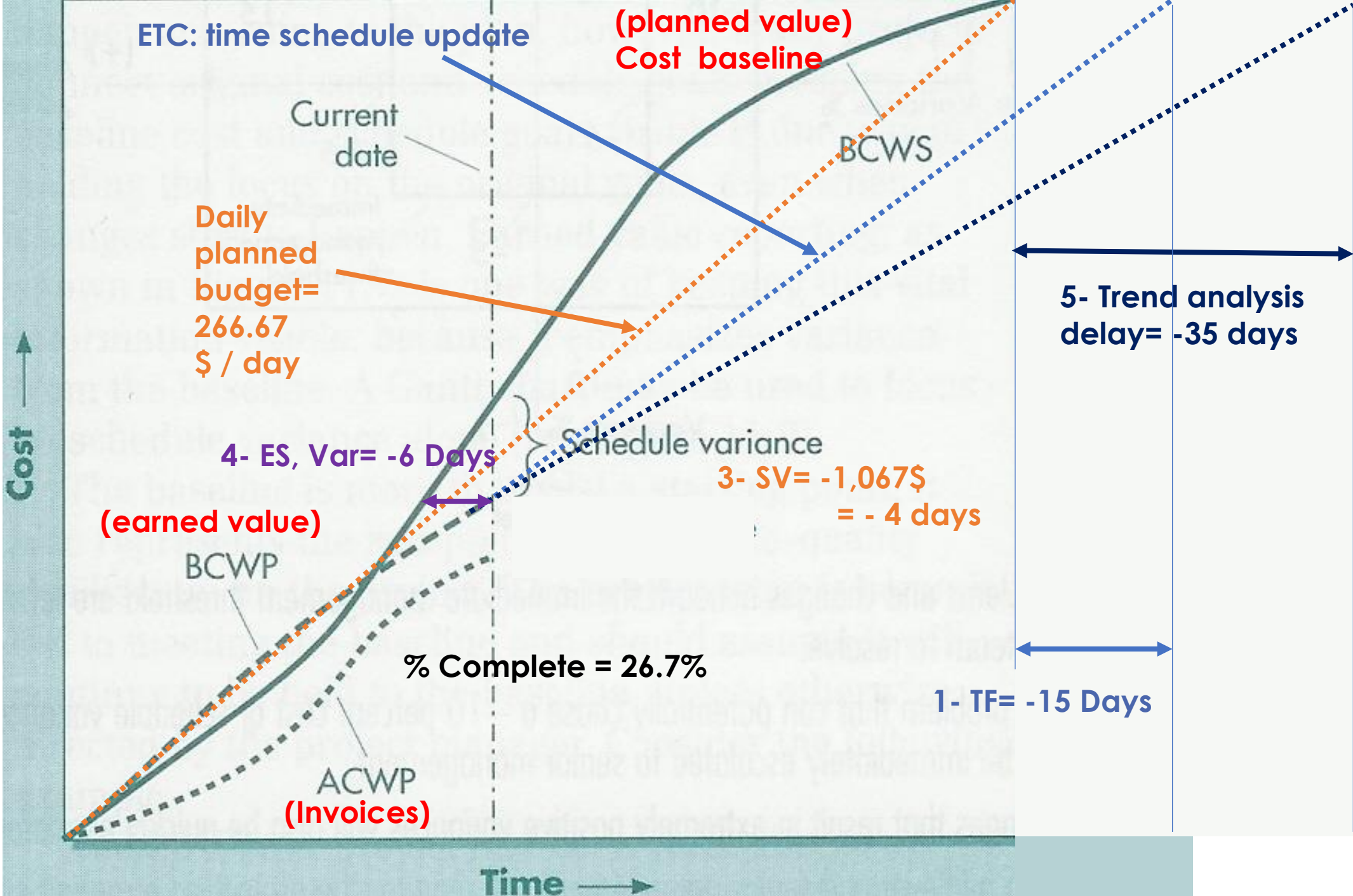
Update TF=0 while Performance% < Scheduled%



2- Line Of Balance



Example of multiple approaches





Case Study #2 – Schedule Forecasting




Delay Quantification

Numerous factors indicate the delays depending on the project type such as:


CPM - Total float
Negative TF is a delay

The total float is +5 days




SPI (Earned value or earned schedule)

SPI = 1.05



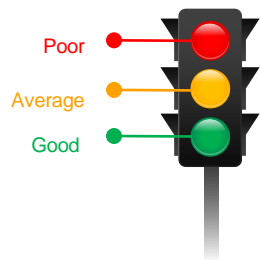

Implementation of the project phases and stages

Mobilization finished, phase one is ahead of schedule and phase 2 is on schedule




Change of the longest critical path

Concrete works of phase two is driving the critical path and many risks are affecting it




Line of balance

The concrete rate is driving the subsequent trades. It started early but the rate may delay the project




Resource Efficiency

Resource efficiency is not acceptable according to **earned manhours and actual manhours**

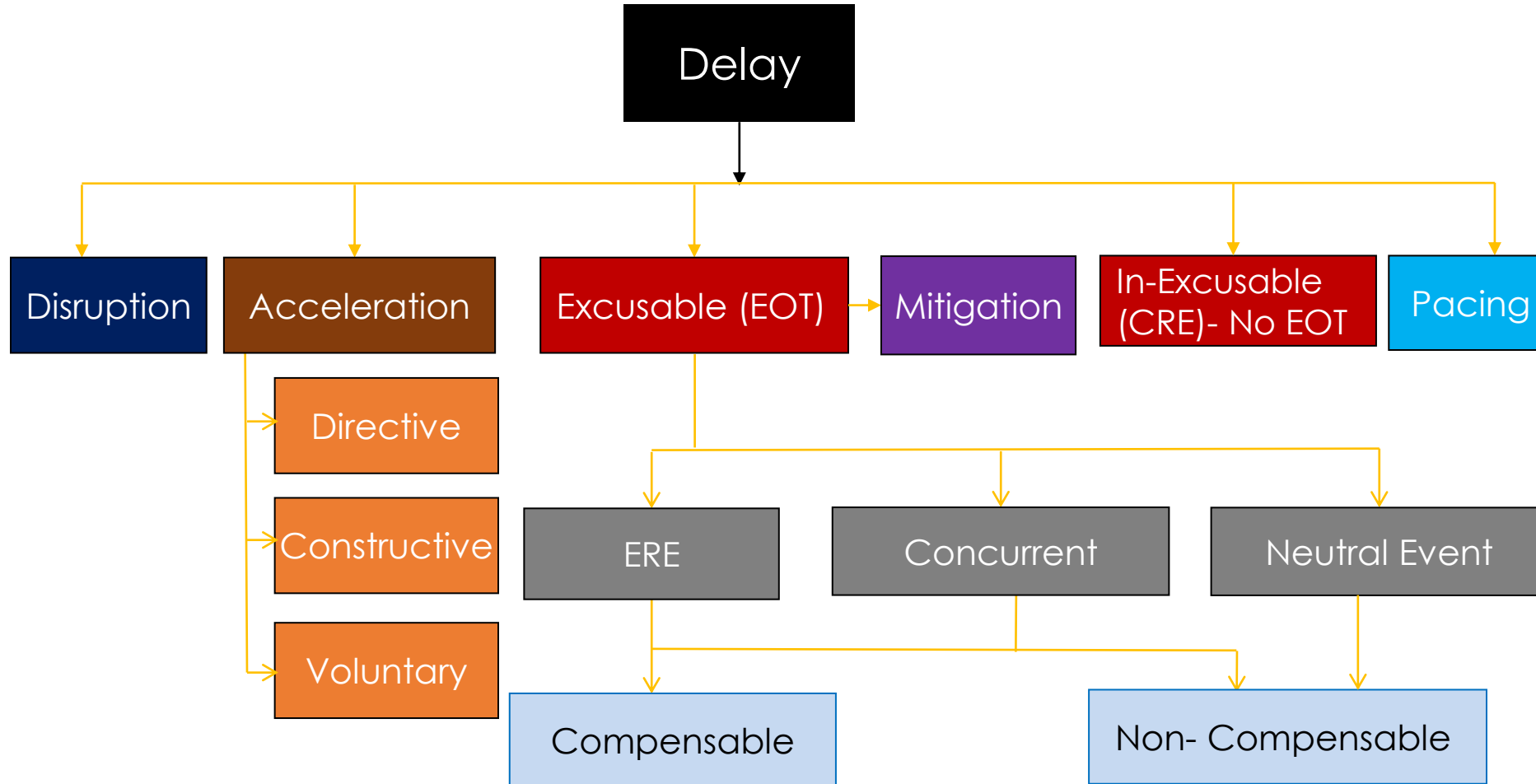


Trend analysis

The average rate of last 6 months is 2.5%
If the progress continues like this, the project will be delayed by 2 days



Delay Related Measures

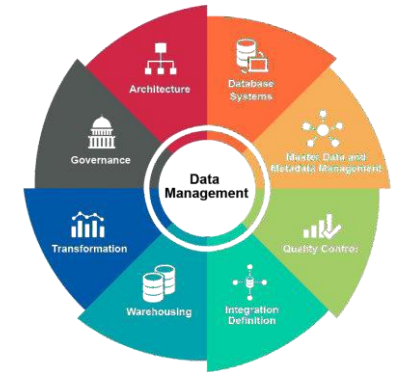


Data Management and Visualization

Data Collection and Compilation

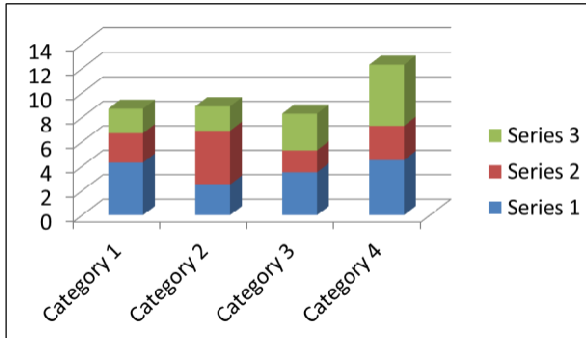
Data Management Process

The **data management process** includes a combination of different functions that collectively aim to make sure that the data in corporate systems is accurate, available and accessible. Most of the required work is done by IT and data management teams, but **business users** typically also participate in some parts of the process to ensure that the data meets their needs and to get them on board with policies governing its use.

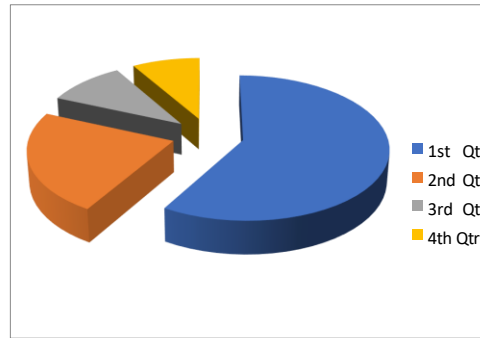


Data Visualization

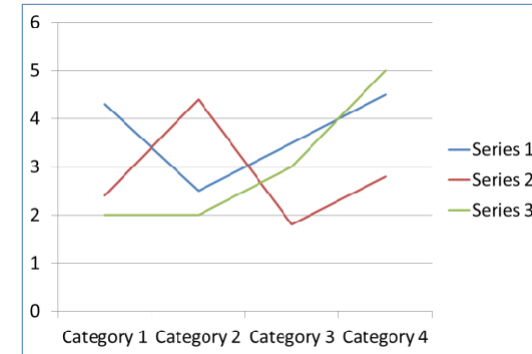
The styles of visualization:



Standard and Stacked Histograms



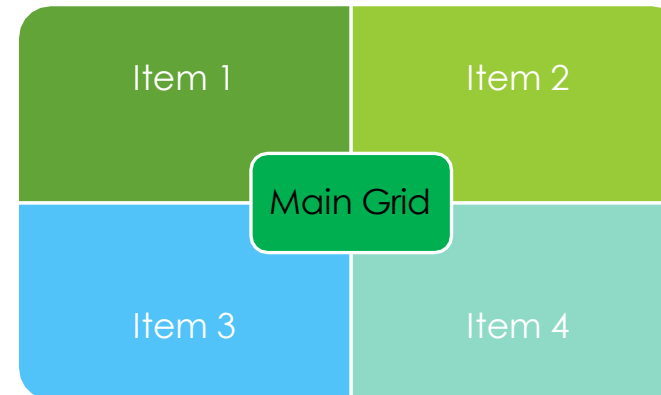
Pie Charts



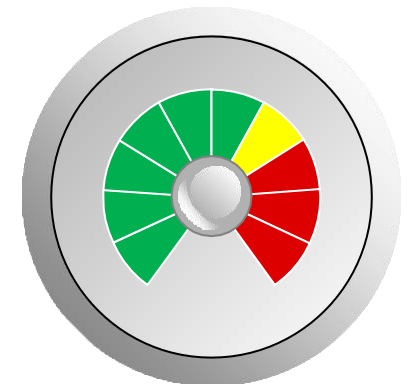
Line Charts

Rank	Company	Order Total	Revenue
1	ACME	\$1,000,000	\$100,000
2	UFP	\$2,500,000	\$250,000
3	Uber Comp	\$1,200,000	\$120,000
4	Happy Games	\$600,000	\$60,000
5	Wonder Comp	\$4,200,000	\$420,000

Tabular Data



Focus Grid (Tiled Matrix)



Speedometer

Data Collection

While the quantity of the data may be impressive, it will be useless, if not dangerous, if the quality is suspect. Equally important is the timing, as late data can seriously affect the making of a decision or the issue of a report.

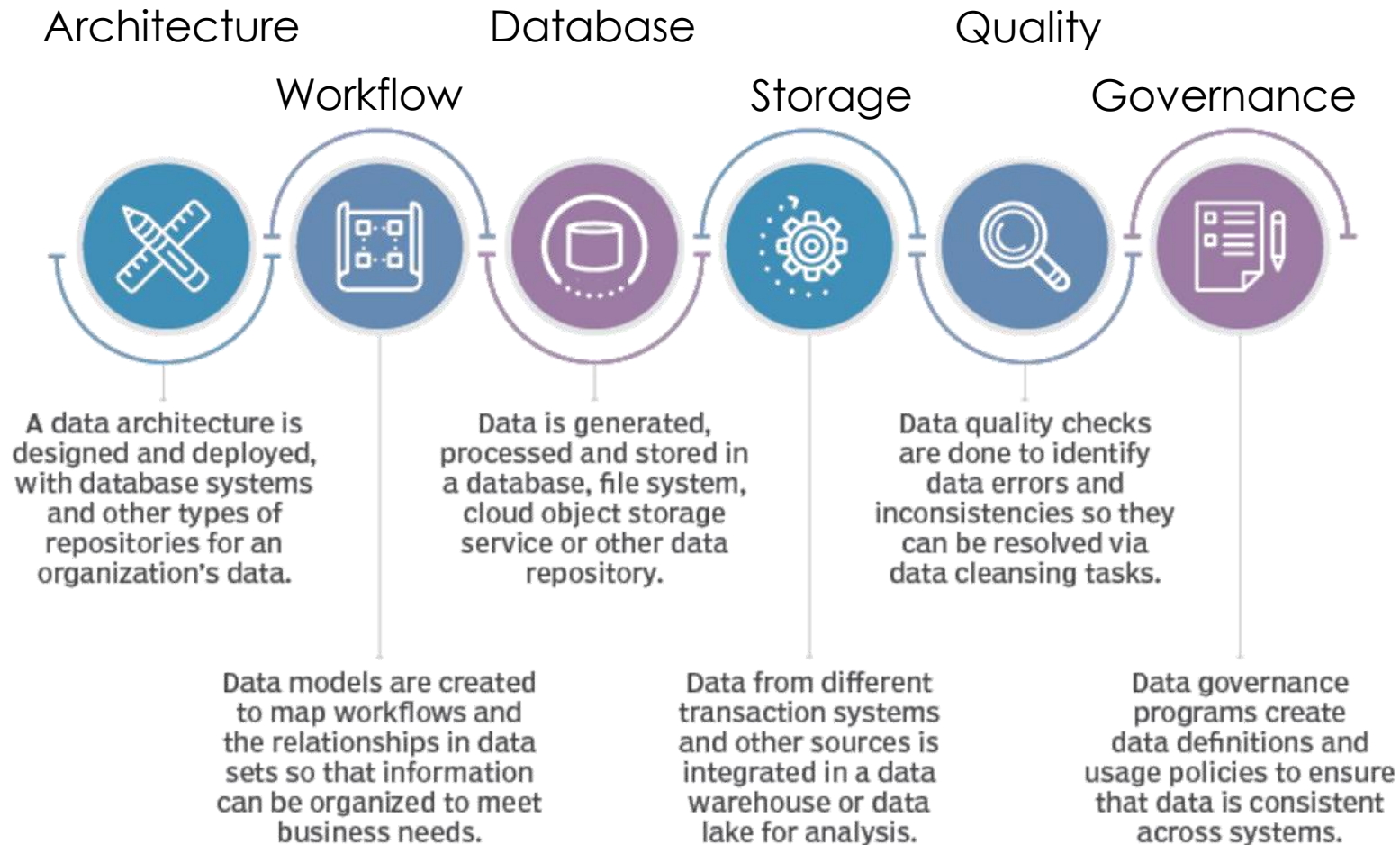
Qualitative. This method includes such techniques as structured interviews, direct observation, discussion groups. Much depends on the skills of the interviewer or discussion leader who must retain an open mind and not ask leading questions. Advantages include high-response rates and the ability to explore in greater depth after an initial analysis.

Quantitative. This covers questionnaires sent by mail or e-mail, telephone surveys, sample surveys based on a large number of participants.

There should be a corporate strategy on data management which covers the operation of central data base, access to data, security, methods of quality verification, evaluation techniques, dissemination and any time or cost constraints.

Big Data. This is the term given to the collection, storing, analysing, categorizing and distributing large amounts of data which is too voluminous to be handled by a conventional relational database.

Key Parts of the Data Management Process



Data Quality

Data quality is the degree to which information fits its purpose. It can be difficult for organizations to agree on criteria because each team may use data towards different purposes. The following are commonly used criteria, data quality.

Relevance

- Data that is useful to support processes, procedures and decision making.

Timeliness

- How quickly data is created, updated and deleted.

Precision

- The exactness of data. For example, a company that has annual revenue of \$3,451,001,323 as opposed to a 3-billion-dollar company.

Correctness

- Data that is free of errors, omissions and inaccuracies.

Completeness

- Data that is complete relative to your business purpose. For example, order details such as color, wheel size and electronics package.

Credibility

- Data that stems from reputable sources such as verified company press releases as opposed to social media rumors.

Traceability

- Data that can be traced to its source. If someone changed your prices, you should be able to figure out who.

Compilation and consolidation

1. Write "Monthly Report", Name of the Project, and The Reporting Period.
2. Collect the data of the Project Progress, Financial Status and Other major information using data gathering templates then documentation.
3. Quality Control (Audit and Review/ Benchmarking).
4. Compile together, Re-Check and Review the format.
5. Outline Applicable Updates on the Project.
6. Discuss any Management Issues.
7. Outline Main Events of the Project.

Sending reminder email

Custodian name	# KPIs to report	# KPIs already reported on	KPIs not reported on yet	Due date	Status	Comment
John Doe	8	8	none	13-Jan-15	Submitted	
Ann Smith	9	8	% Ambulance service budget out of total operational budget	13-Jun-15	Outstanding	
Emory Lafayette	5	3	% Profit rate, \$ Revenue per patient	13-Jun-15	Outstanding	
Carlos Mendoza	6	5	% Successful treatments delivered	13-Jun-15	Outstanding	
Ahmed Alsaudi	5	3	# Visits per patient, # Physicians per shift	13-Jun-15	Outstanding	
Luis Ramirez	4	3	# Emergency room patient wait time	13-Jun-15	Outstanding	
Anthony Gleason	2	0	# Medical service quality rating, % Treatment price variance from market average	13-Jun-15	Not submitted	
Mike Myers	1	0	% Market share	13-Jun-15	Not submitted	





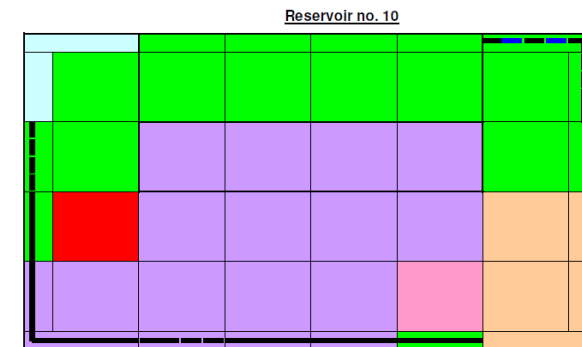
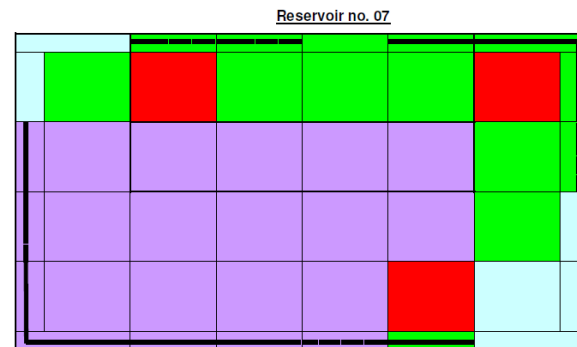
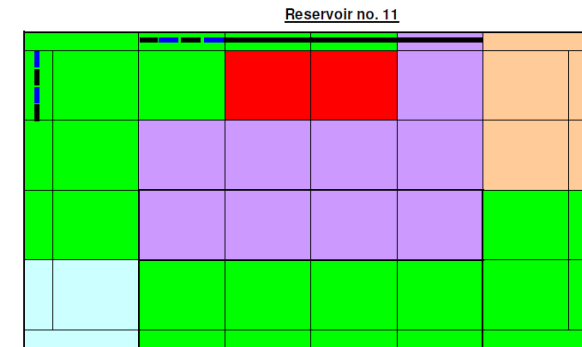
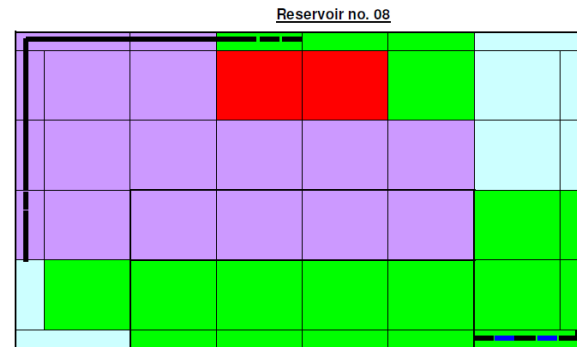
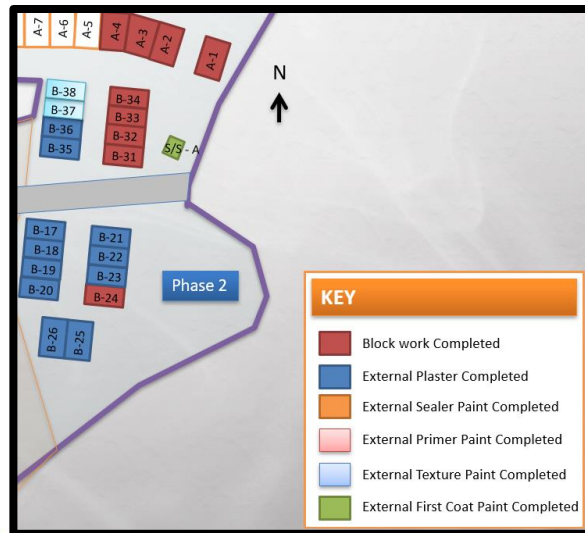
Case Study #3 – Visualization



Stakeholders Requirements

The Organization Level and Stakeholders Requirements should be considered

Schedule % Complete	Performance % Complete
0%	0%
0%	0%



	Planned	Actual	Actual / Plan
Reservoir 07	60.2%	69.3%	115%
Reservoir 08	43.0%	57.7%	134%
Reservoir 10	46.8%	60.1%	128%
Reservoir 11	38.2%	49.8%	130%
Total	47.1%	59.2%	126%

- Formation Level
- Pouring of Blinding concrete
- Water Proofing under Base
- Pouring Screed above Proofing
- Base Water stop joints
- Base Shutter & steel fixing
- Pouring of RC Base
- Slab & Col.s Shutter & Steel fixing
- Pouring of RC Columns
- Pouring of Internal walls
- Ext. Walls Shutter & Steel fixing
- Pouring of RC External Walls
- Pouring of RC Roof slab

KPIs and Dashboards

Metrics Selection and Reporting Role in Decision Making

What are the KPIs?

KPIs Require Strategic Context



KPI Definition

A Key Performance Indicator is a measurable value that demonstrates how effectively a company is achieving key business objectives. Organizations use **KPIs** at multiple levels to evaluate their success at reaching targets.

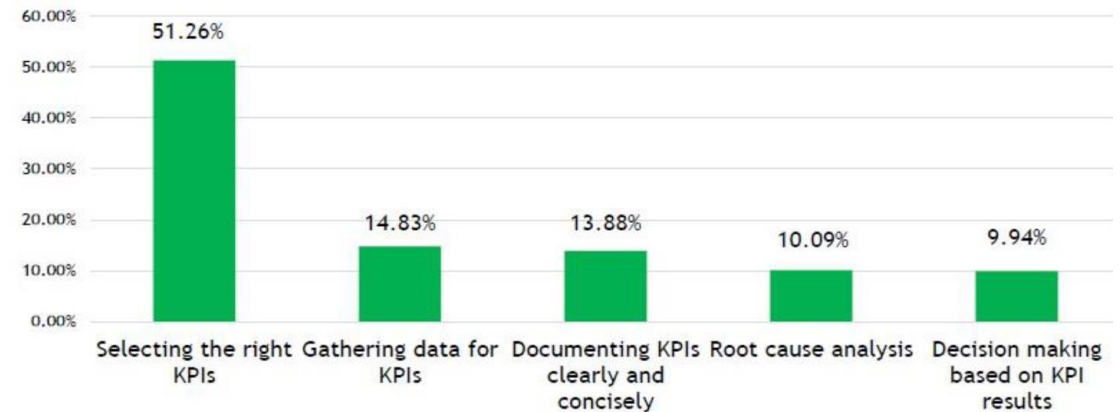


Metrics and KPIs

The selection of KPIs:

- Try to avoid using too many KPIs on a singular dashboard.
- Use effective spacing; try not to 'clutter' your dashboard with KPI charts mashed up together too tightly.
- Keep KPI chart tiles at uniform sizes (when possible); it is far easier to scan a dashboard with equally sized chart widgets.
- Leverage 'highlighting' when possible to bring out specific data points more easily.
- Provide 'drill down' or 'tool tip' capability if possible; this will give additional information to the end user as they hover or click over parts of the charts.
- Have additional controls if possible; i.e. zooming, filtering, color adjustment, etc.

What is the most challenging aspect of working with KPIs?

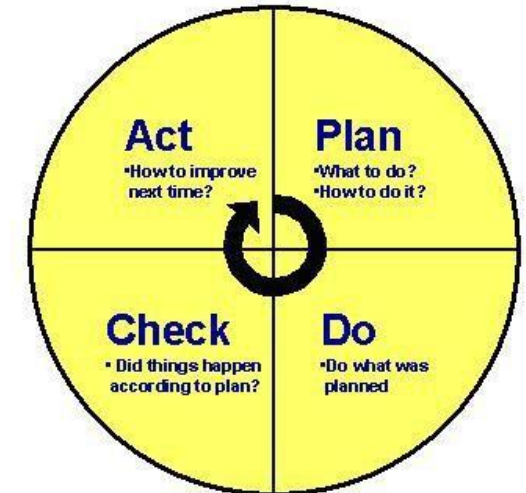
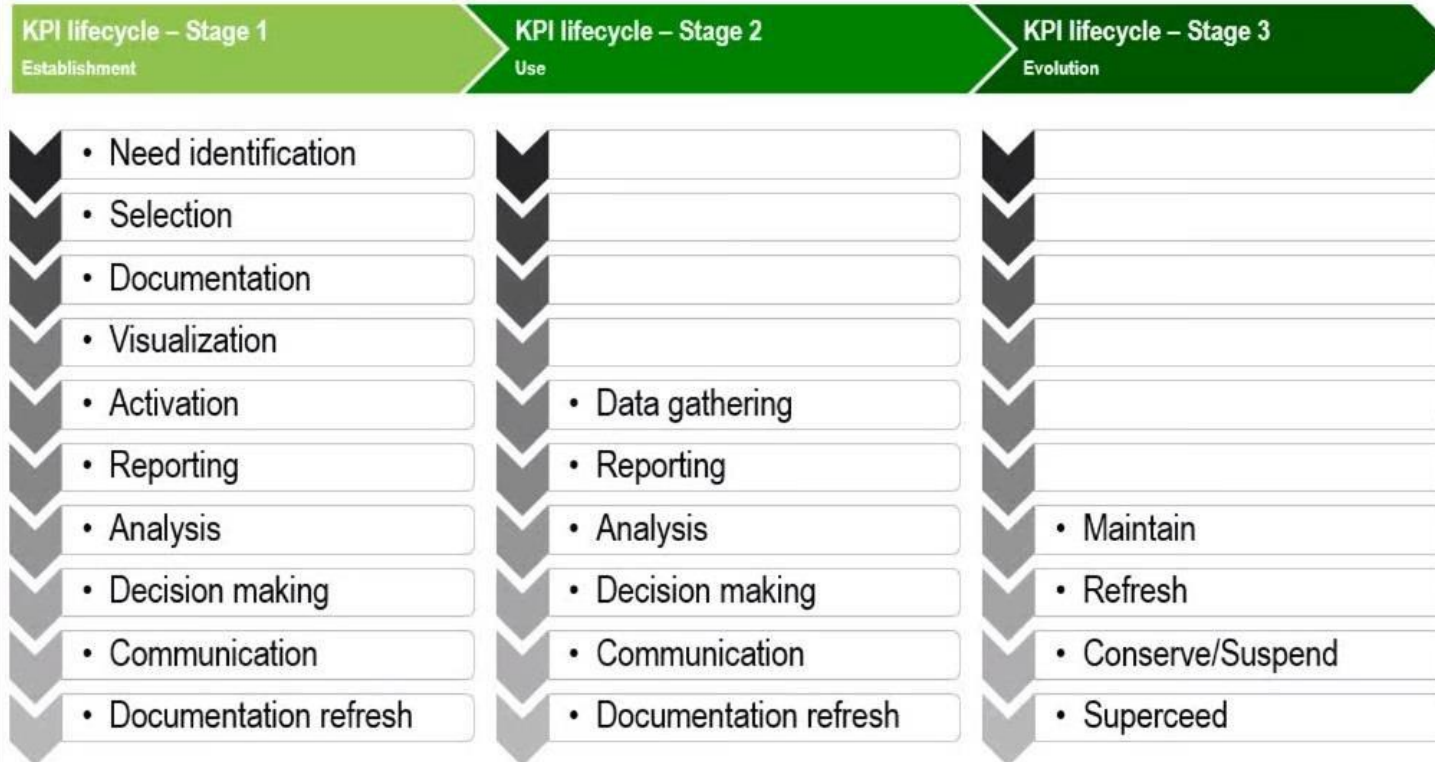


KPIs Lifecycle

THE KPI INSTITUTE

smartKPIs.com
The smart choice in performance management

KPI lifecycle



Dashboard Organization

- Picking the right KPIs is a group exercise and should be done with care.
- Displaying KPIs should be done in an easy to interpret fashion, minimizing clutter and 'noise' as much as possible.
- A dashboard is the most efficient way of displaying multiple KPIs in a singular view.
- KPIs are the mechanism by which a project manager can gauge the status of their project.



Targets and Threshold

The variance and index:

Variance measures how far a set of data is spread out while **Index numbers** are used to measure changes in the value of money or the price level from time to time.

Control thresholds. Variance thresholds for monitoring cost/schedule performance, amount of **allowed variation** before some action needs to be taken (Risk responses).

Project Managers and others must decide where the problems lie and what actions to take or recommend. Poor execution may call for recovery, while poor planning may call for replanning.

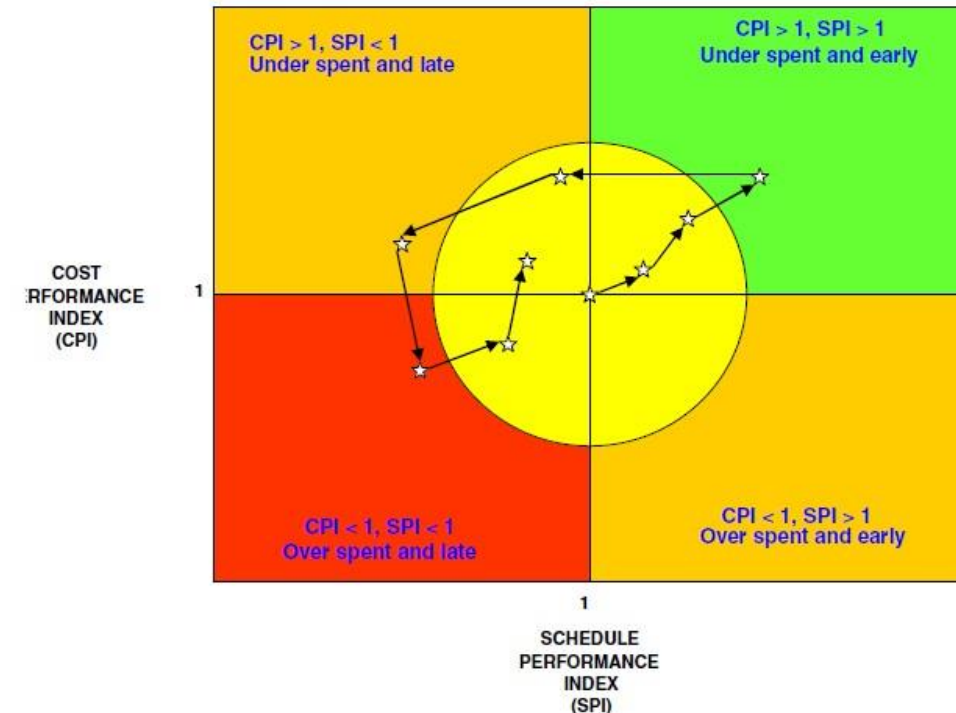


Figure 10 – Bullseye Chart

Risk Control

Control Risks. Implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness.

Workaround. A response to a threat that has occurred, for which a prior response had not been planned.



Performance Management & Decision Making





Case Study #4 – Standardization

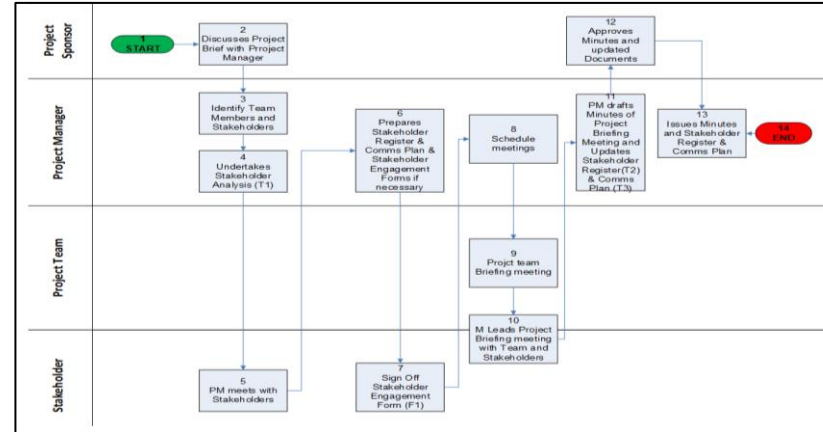


Case Study #4 – Standardization

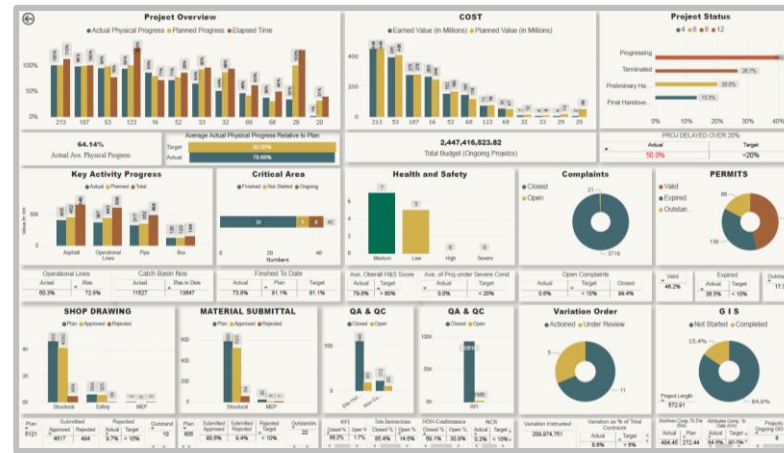
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Standardization



Applying
Appropriate
Processes



Multi-level
Dashboards
Digitalization

Closing Note – Non-scheduling Issues

NON-SCHEDULE PLANNING METHODOLOGIES

Typically, these methodologies are **not specially itemized in the schedule**, but are critical functions of the project that need to be planned out for project success. These methodologies include, but are not limited to:

- Design **interface** and execution plans
- **Temporary facilities** plan
- Placement of **cranes**
- Owner provided material/**procurement** planning
- **Emergency** reaction plans
- Site **access** plan
- Crane and heavy **lift plans**
- Engineered and long lead material/**procurement** plans
- Packaging, handling, storage, and **logistics** plans
- Other such **specific purpose plans**

It is important for planning of these logistic methodologies **to ensure smooth construction operations**. Logistics planning is comprised of planning, application, coordination, and supervision necessary to manage labor, material and equipment to/from and around the project site. **The result of this logistics planning** will be efficient and productive construction operations to **support the overall project schedule and potentially reduce cost**.



THANK YOU