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Measurement

Performance Domain - PMBOK 7th Edition

Project Performance Domains

Measurement Performance Domains

Measurement **Performance Domain**

MEASUREMENT PERFORMANCE DOMAIN	
The Measurement Performance Domain addresses activities and functions associated with assessing project performance and taking appropriate actions to maintain acceptable performance.	Effective execution of this performance domain results in the following desired outcomes ▪ A reliable understanding of the status of the project. ▪ Actionable data to facilitate decision making. ▪ Timely and appropriate actions to keep project performance on track. ▪ Achieving targets and generating business value by making informed and timely decision based on reliable forecasts and evaluations.

Measurement involves assessing project performance and implementing appropriate responses to maintain optimal performance

Why Measurement Matters

Measure to understand project health and assess progress.

Identify opportunities to improve performance and reduce risk.

Demonstrate project value and justify resource allocation.

Defining Measurement in Project Management

Collecting and analyzing data on project performance.

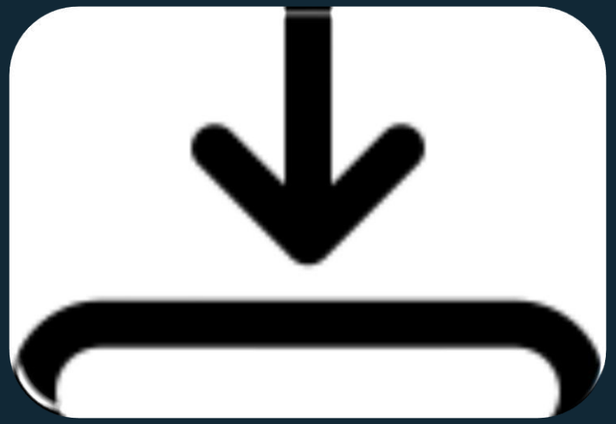
Assessing progress against defined goals and objectives.

Providing insights to inform decision-making and adjust strategies.

Measurement Performance Domains

The following definitions are relevant to the Measurement Performance Domain:

Metrics. A description of a project attribute and how to measure it. Quantifiable measures used to track progress.



Baselines. The approved version of a work product used as a basis for comparison to actual results. Reference points for comparing actual performance to plans.

Dashboards. A set of charts and graphs showing progress of performance against important measures of the project.

Visual representations of key metrics and trends

Reasons for Measurement

1 Identify deviations

Track progress and detect variances from the plan.

2 Improve decision-making

Provide data-driven insights for informed choices.

3 Enhance accountability

Hold stakeholders accountable for results.

4 Demonstrate value

Showcase project success and ROI.

What to Measure

1 Scope

Progress against defined deliverables and requirements.

2 Schedule

Timeliness of tasks and adherence to deadlines.

3 Cost

Budget adherence and resource utilization.

4 Quality

Conformance to standards and expectations.

5 Delivery

Delivery measurements are associated with work in progress. These measures are frequently used in projects using adaptive approaches.

6 Business Value

Achievement of business value as stated in the business case

7 Forecast

Projection of project drivers into the future

Performance Measurement Frameworks

Earned Value Management (EVM)

A comprehensive method for measuring project performance.

Agile Metrics

Track velocity, burn-down charts, and other Agile-specific metrics.

Custom Frameworks

Tailored measurement systems based on specific project needs.

Key Performance Indicators - Leading Indicators and Lagging Indicators

Leading Indicators

Predict future performance based on current trends.

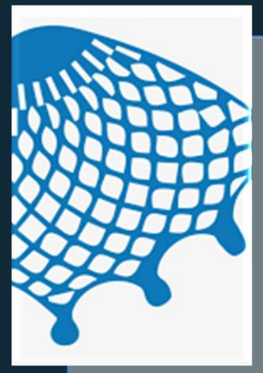
Lagging Indicators

Measure past performance and reflect on completed work.

Business Value

Business value measurements are used to ensure the project deliverable stays aligned to the business case and the benefits realization plans. Business value has many aspects both financial and nonfinancial. Metrics that measure financial business value include;

Return on Investment (ROI). A measure of the amount of financial return compared to the cost, ROI is generally developed as an input to the decision to undertake a project. There may be estimates of ROI at different points in time across the project life cycle.



Net Present Value (NPV). The difference between the present value of inflows of capital and the present value of outflows of capital over a period of time, NPV is generally developed when deciding to undertake a project. By measuring the NPV throughout the project, the project team can determine if it makes sense to continue the investment of organizational resources.

Stakeholder

Stakeholder satisfaction can be measured with surveys or by inferring satisfaction, or lack therefore, and by looking at related metrics, such as:

Net Promoter Score (NPS). A Net Promoter Score measures the degree to which a stakeholder (usually the customer) is willing to recommend a product or service to others. It measures a range from -100 to +100. A high Net Promoter Score not only measures satisfaction with a brand, product, or service, it is also an indicator of customer loyalty.

Mood Chart. A mood chart can track the mood or reactions of a group of very important stakeholders – the project team. At the end of each day, project team members can use colors, numbers, or emojis to indicate their frame of mind. Tracking the project team's mood or individual project team member's moods can help to identify potential issues and areas for improvement.

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Monitoring and Controlling Processes

1 Collect data

Gather information on project performance regularly.

2 Analyze data

Identify trends, variances, and areas for improvement.

3 Take corrective action

Implement measures to address performance issues.

4 Update plans

Adjust project plans based on new insights and data.

Project Performance Measurement Techniques

Earned Value Management (EVM)

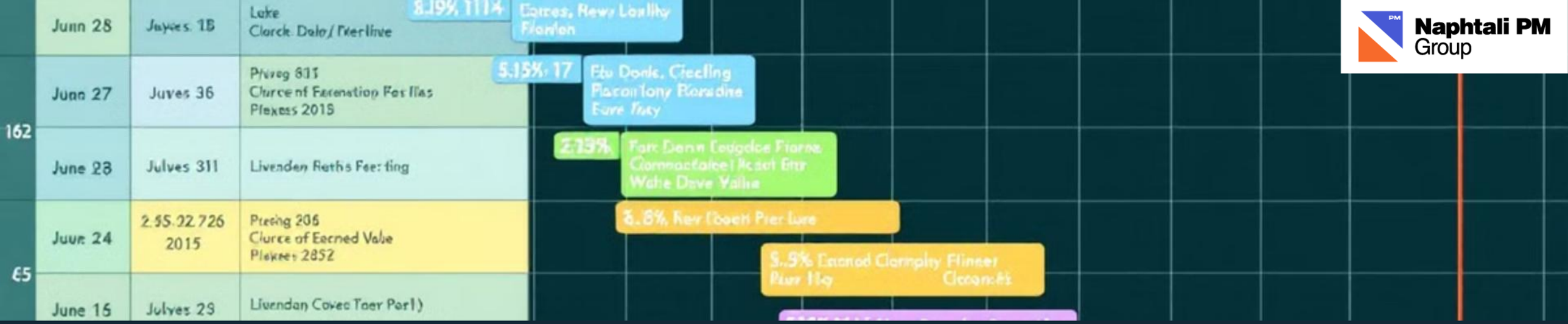
A comprehensive approach to measure project performance.

Agile Metrics

Track velocity, burn-down charts, and other Agile-specific metrics.

Custom Metrics

Tailored measurements based on specific project needs.



Earned Value Management (EVM)

1 Planned Value (PV)

The budgeted cost of work scheduled to be completed.

2 Earned Value (EV)

The value of the work actually completed.

3 Actual Cost (AC)

The actual cost incurred to complete the work.

EVM Metrics and Analysis

Schedule Performance Index (SPI)

Measures schedule efficiency.

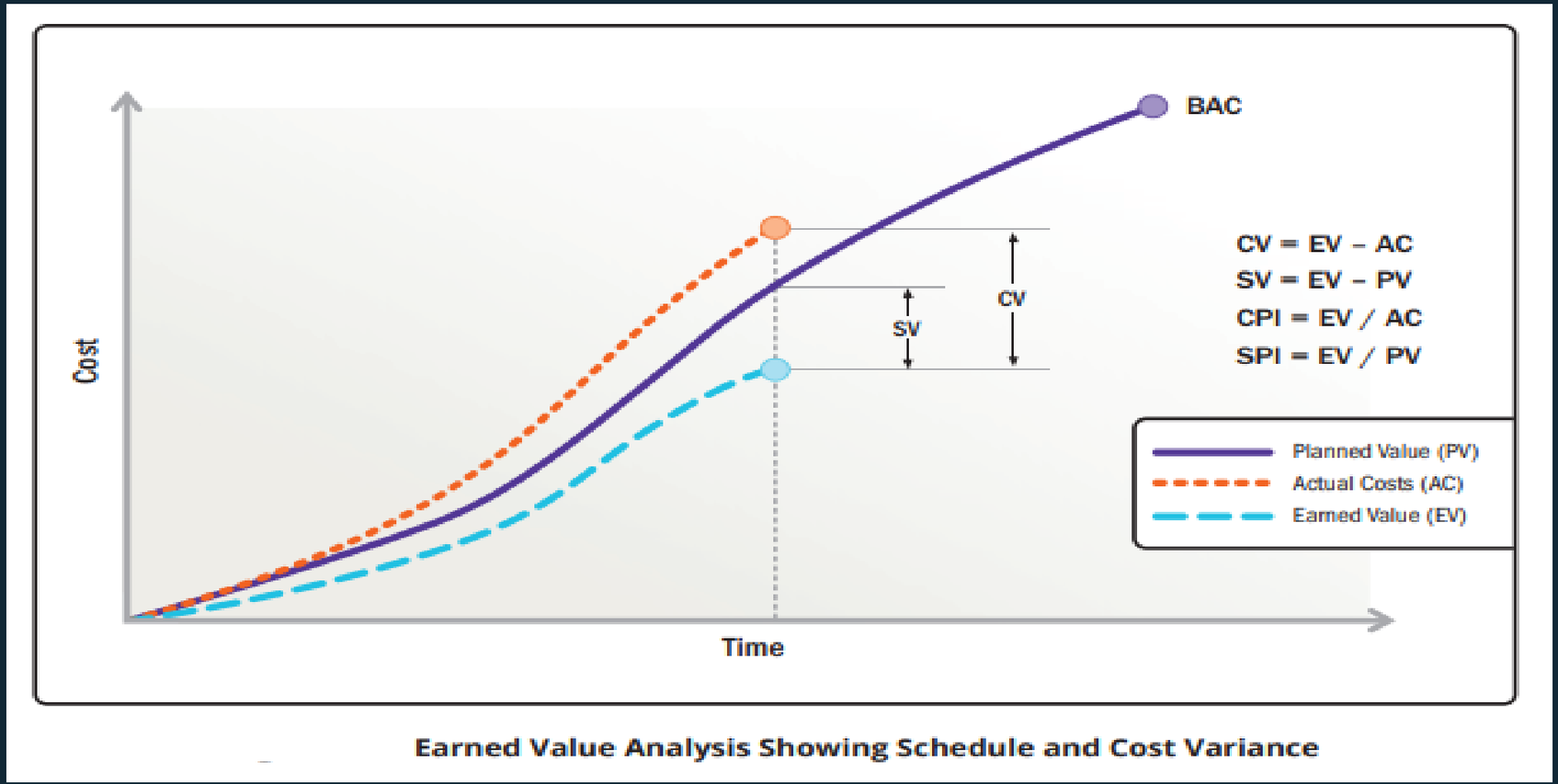
Cost Performance Index (CPI)

Measures cost efficiency.

Variance Analysis

Identifies differences between planned and actual performance.

EVM Metrics and Analysis



Earned Value Analysis Showing Schedule and Cost Variance

Schedule Performance Index (SPI)

SPI = EV / PV

- SPI less than 1 indicates behind schedule.
- SPI greater than 1 indicates ahead of
- SPI equals 1 indicates on schedule.

Cost Performance Index (CPI)

CPI = EV / AC

- CPI less than 1 indicates over budget.
- CPI greater than 1 indicates under budget.
- CPI equals 1 indicates on budget.

Flast Qulobal valiancs

Schedule Variance		Flaxt	
	$141,10%	£1,15,000	£2,55,000
Crate calls	$11,660,000	$11,140,000	$1,456,500

Schedule Variance			
Cost Value:	£1,10,000	£1,56000	£1,54,500
Carne Value:	$1,67,000	£1,06,000	$2,52,60%
Callection	£+25,155	+(,79%	+1110,07%
Cortoue Value	$ +(0),89	11.0%)	11-10,00%
Contbultcational	$+(41,59)	$+1,625%	++88,00%
Corraiva Valus	$+(0,01)	-+1,1,5%)	£+(2,,70)

Cost Variance			
Cost Value:	$1,15,500	£1,41,500	£1,95,000
Schedule Variance: Plxt	$$1.75,100	$1,00,000	$1,14,900
Cortedler Value:	$+16,000	£+5,50?%	$+(11,01%
Procation Wish	$-57,205	-4,195%	£+15,00%
Corraive Valer	$+12,555	£+1,079%	£+(10,000

Earned Value Variance			
Cost Valuee	$1,17,000	$1,17,500	£1,53,500
Cornuleriuler	£1,157,00	£1,67,000	$1,515,600
Proable Vallar Valics:			
Cost sact Value	+(51,200	+5,525%	+110,000
Corraive Value	91,345	-+7,08%	3,1%
Carcaive Valler	£+31,50%	+4,051%	£+21,00%

Earned Value Variance			
Carned Value	$1,55,500	$1,56,600	$4,53,500
Cost-Vallue:	$2(55,000	+$5,(00	£5,600,000
Carcaive Variral	$+(25,553)	$+34,000	$+(1,59%)
Currave Value	+11,40%	+14,09%	+15,04%
Corcaive Valler	£+17,000	£+57,94)	£+(5,79%)

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Variance Analysis

1 Schedule Variance (SV)

Difference between earned value and planned value.

2 Cost Variance (CV)

Difference between earned value and actual cost.

3 Earned Value Variance (EVV)

Difference between earned value and the baseline plan.

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Forecasting Project Performance

1 Estimate to Complete (ETC)

Forecasted cost to complete the remaining work.

2 Estimate at Completion (EAC)

Forecasted total cost of the project.

Forecast - Estimate at Completion (EAC)

* Scenario 1 - Project to continue as planned

EAC = AC +(BAC – EV)

Calculates the estimated total cost of the project.

* Scenario 2 - Project to continue at same efficiency

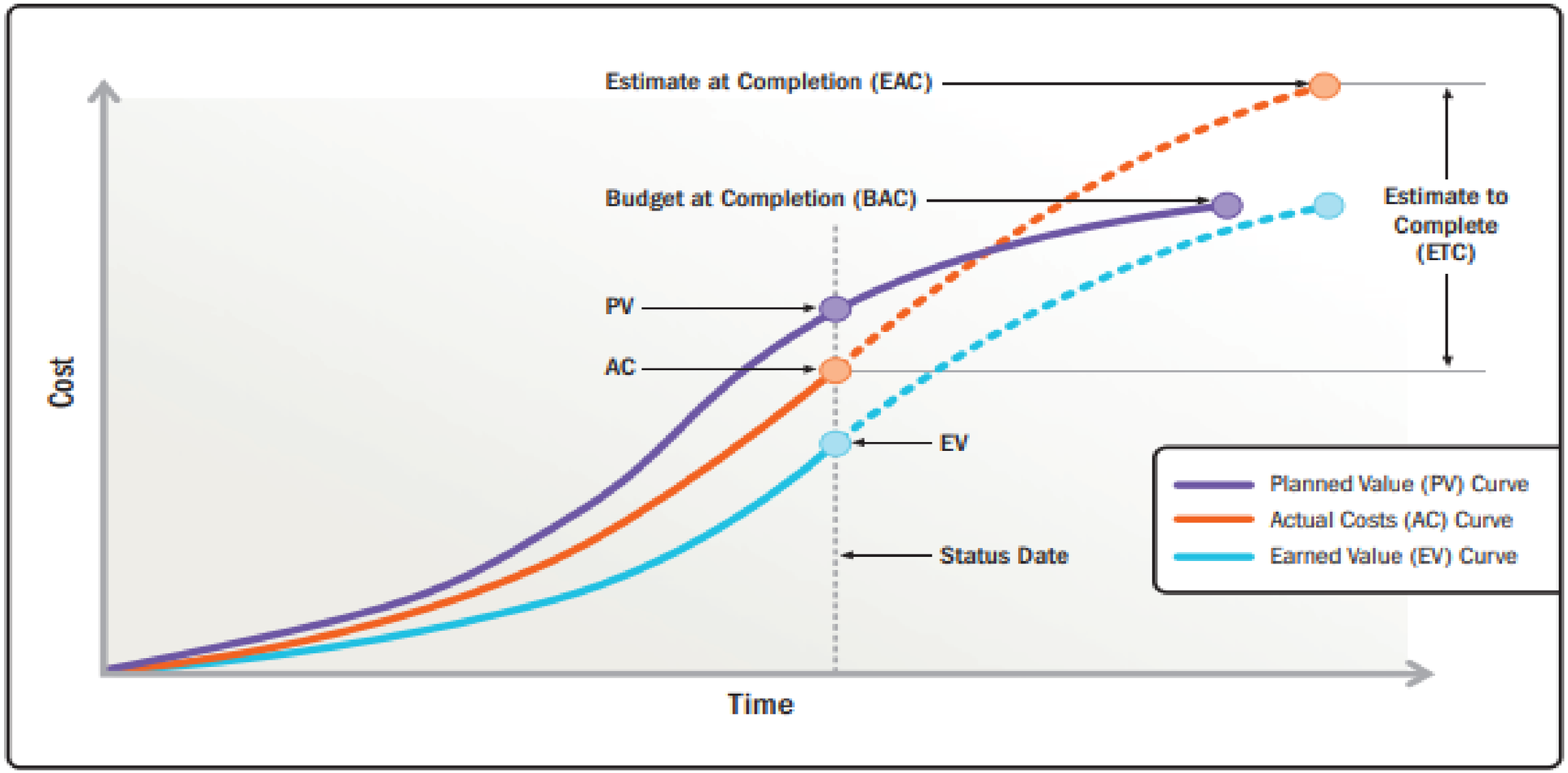
EAC = BAC / CPI

Adjusts the EAC based on current cost performance.

* Scenario 3 - Project to continue using new estimate

EAC = AC + ETC

Forecast



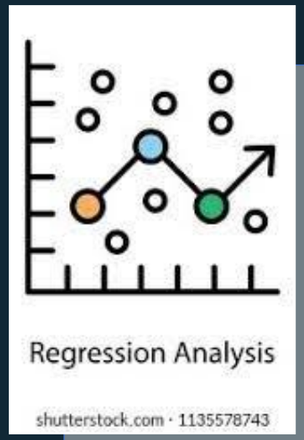
Forecast of Estimate at Completion and Estimate to Complete

Forecast

Variance at Completion (VAC). An earned value management measure that forecasts the amount of budget deficit or surplus. It is expressed as the difference between the budge at completion (BAC) and the estimate at completion (EAC).

To-Complete Performance Index (TCPI). An earned value management measure that estimates the cost performance required to meet a specified management goal. TCPI is expressed as the ratio of the cost to finish the outstanding work to the remaining budget.

Forecast



Regression Analysis. An analytical method where a series of input variables are examined in relation to their corresponding output results in order to develop a mathematical or statistical relationship. The relationship can be used to infer future performance.

Throughput Analysis. This analytical method assesses the number of items being completed in a fixed time frame. Project teams that use adaptive practices use throughput metrics such as features complete vs. features remaining, velocity, and story points to evaluate their progress and estimate likely completion dates. Using duration estimates and burn rates of stable project teams can help verify and update cost estimates.

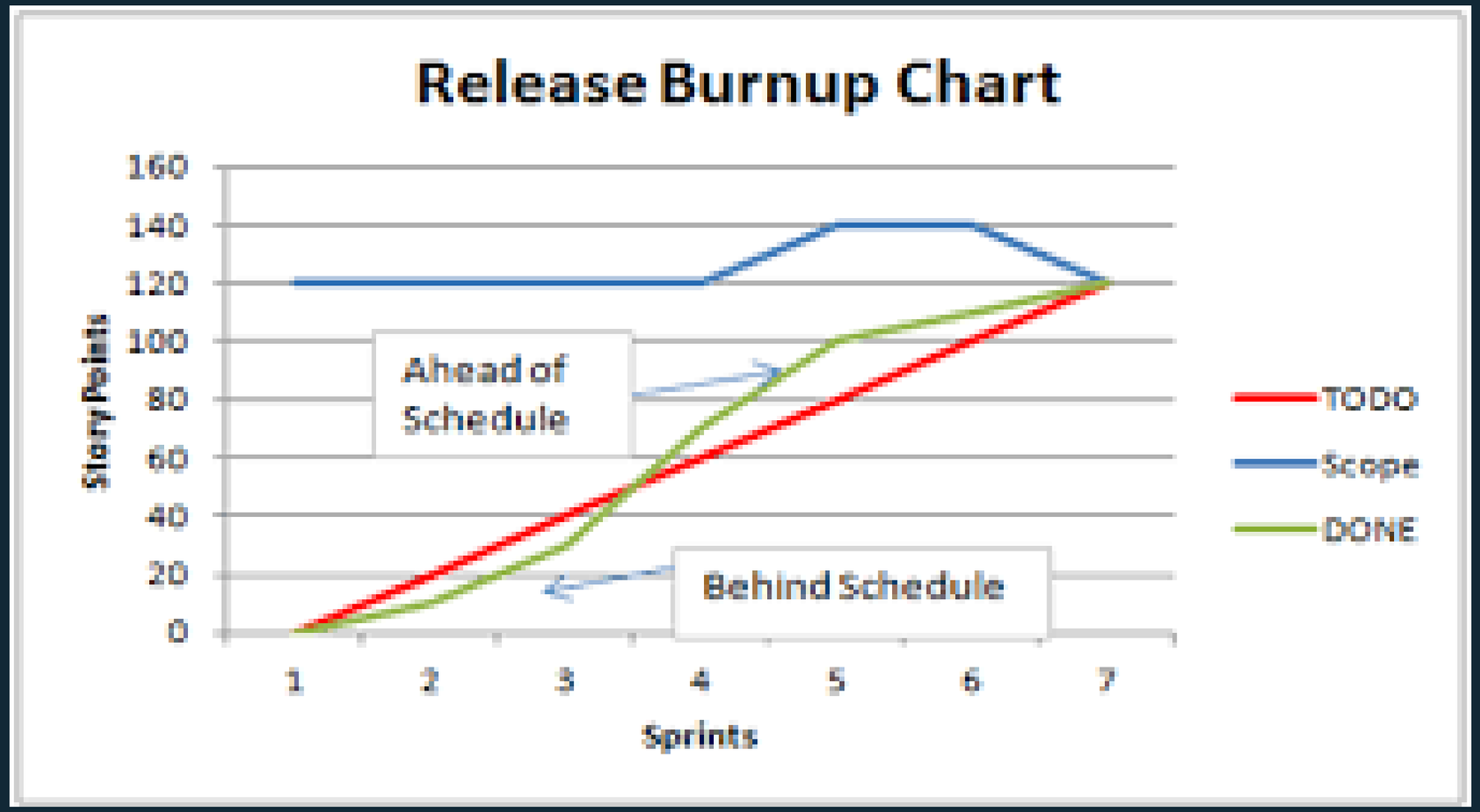
Information Radiators – Burn Up Chart

A burn up chart is **a visual diagram commonly used on Agile projects to help measure progress**. Agile burn up charts allow project managers and teams to quickly see how their workload is progressing and whether project completion is on schedule.

It shows how much work has been completed

Burn Up chart is used it **to identify how far off you are from completing a project**. Remember, a project is complete when your work completed line meets your total work line. You can also use it to chart how much work your team completed during each sprint (iteration). This is an easy way to identify when your team was most productive

Information Radiators – Burn Up Chart



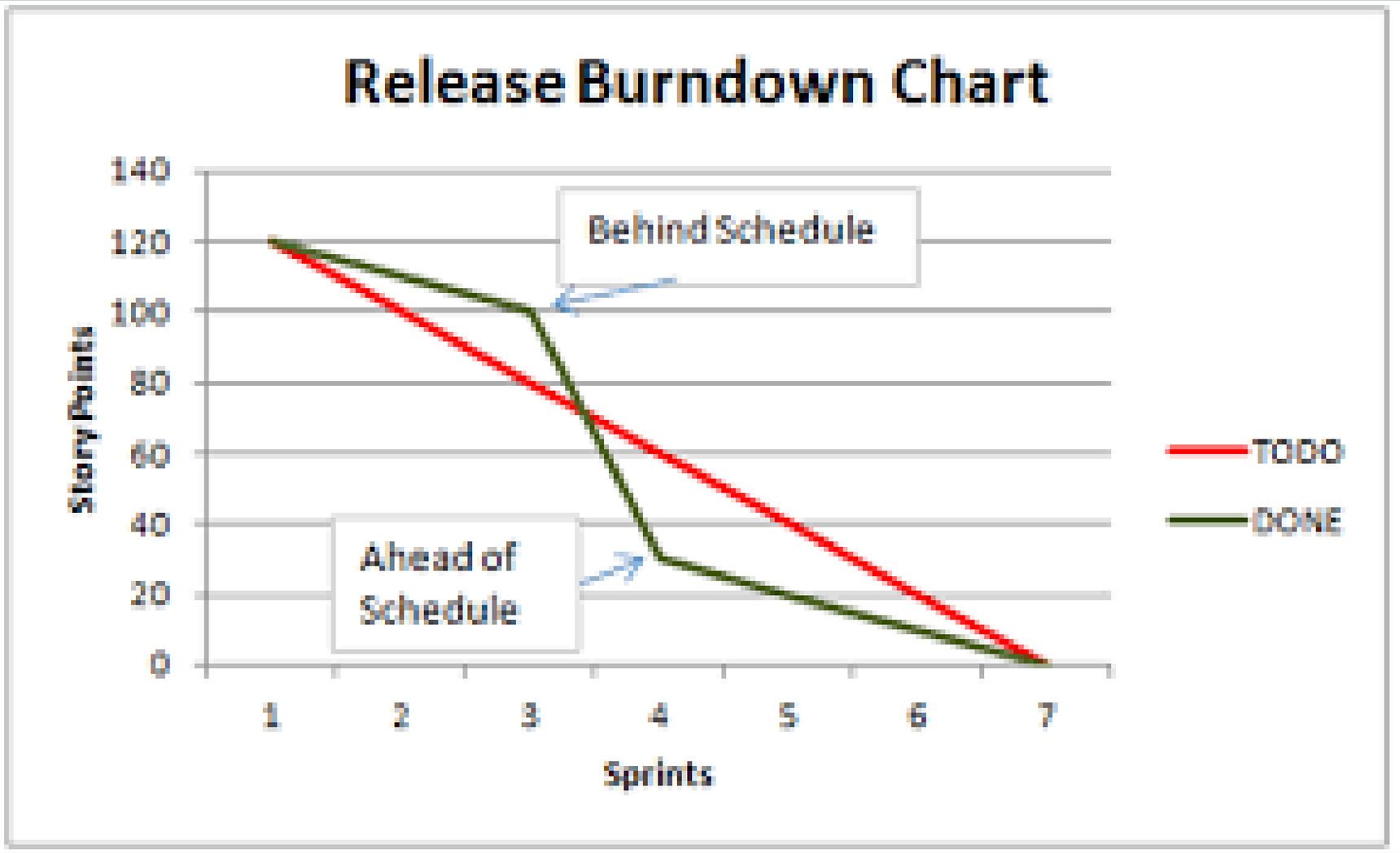
Information Radiators – Burn Down Chart

A burn-down chart **shows the amount of work that has been completed in an epic or sprint, and the total work remaining**. Burn-down charts are used to predict your team's likelihood of completing their work in the time available.

It shows how much work yet to be completed.

he burn-down chart provides a day-by-day measure of the work that remains in a given sprint or release. The slope of the graph, or burn-down velocity, is calculated by **comparing the number of hours worked to the original project estimation** and shows the average rate of productivity for each day

Information Radiators – Burn Down Chart



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Reporting Project Performance

1 Regular updates

Provide frequent performance reports to stakeholders.

2 Visualizations

Use graphs, charts, and dashboards to communicate data effectively.

3 Key takeaways

Highlight important insights and recommendations.

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Dashboards and Visualization

A common way of showing large quantities of information on metrics is a dashboard. Dashboards generally collect information electronically and generate charts that depict status. Often dashboards offer high level summaries of data and allow drill down analysis into contributing data.

1 Visual clarity

Present data in a visually appealing and easy-to-understand format.

2 Data insights

Provide quick and easy access to key metrics and trends.

3 Actionable information

Enable stakeholders to make informed decisions.

Metrics for Project Objectives

Scope Metrics

Track progress against deliverables and requirements.

Schedule Metrics

Measure timeliness and adherence to deadlines.

Cost Metrics

Assess budget adherence and resource utilization.

Quality Metrics

Monitor conformance to standards and expectations.

Risk Metrics

Identify, assess, and mitigate potential threats.

Stakeholder Metrics

Track engagement, satisfaction, and alignment.

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Features of Effective Metrics

Relevant

Metrics should align with project objectives and goals.

Accurate

Data should be reliable and reflect actual performance.

Timely

Metrics should be collected and analyzed promptly to inform decisions.

Accessible

Data should be easily accessible and readily available to stakeholders.

Scope Metrics

1 Requirement Completion

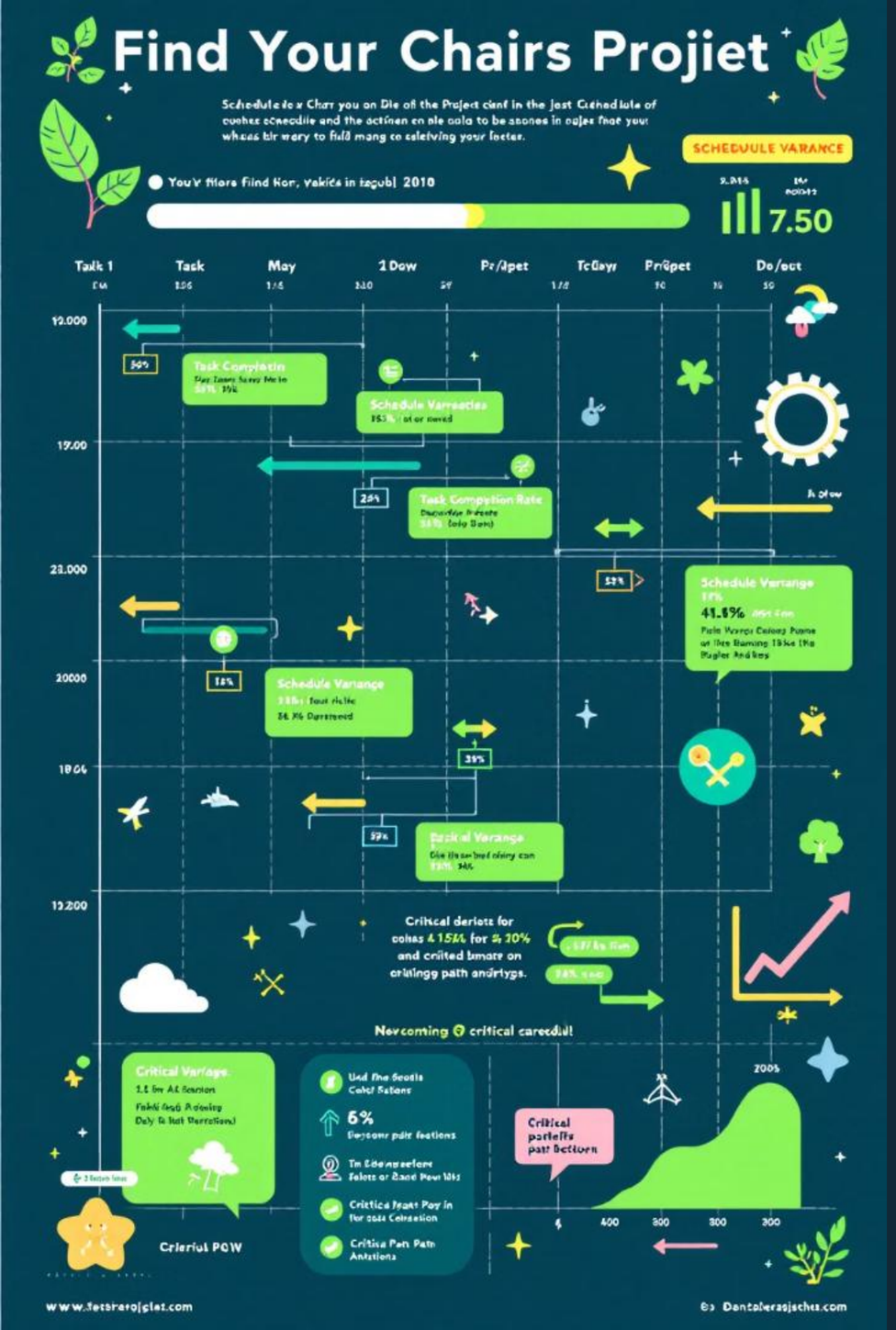
Percentage of requirements completed.

2 Deliverable Completion

Percentage of deliverables completed.

3 Defect Rate

Number of defects discovered per unit of work.



Schedule Metrics

1 Task Completion Rate

Percentage of tasks completed on time.

2 Schedule Variance

Difference between earned value and planned value.

3 Critical Path Analysis

Identify dependencies and critical tasks impacting schedule.

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Cost Metrics

1 Actual Cost (AC)

Actual expenses incurred to complete the work.

2 Budgeted Cost (BC)

The approved budget for the project.

3 Cost Performance Index (CPI)

Measure of cost efficiency (EV / AC).

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Quality Metrics

1 Defect Rate

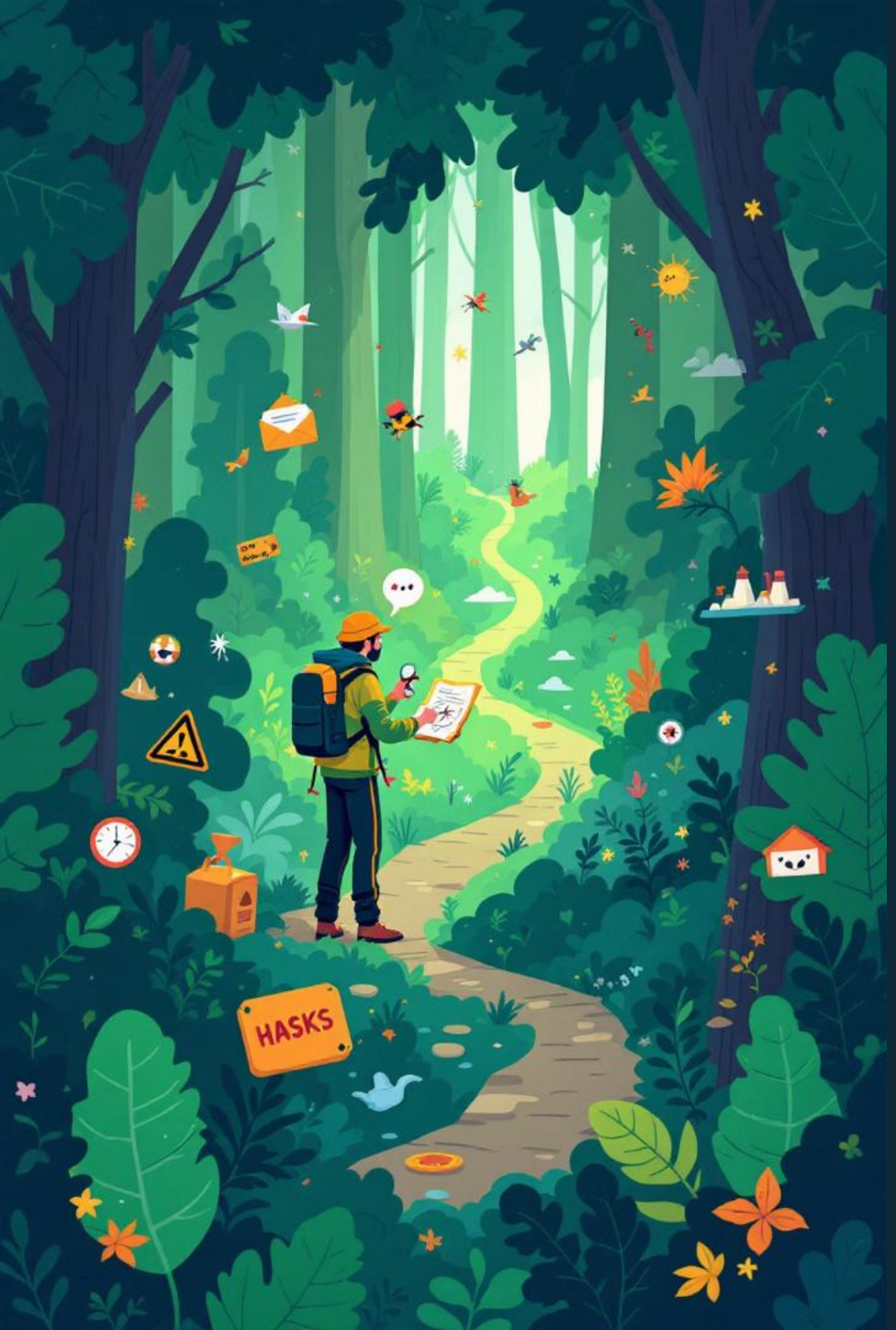
Number of defects per unit of work.

2 Customer Satisfaction

Feedback and ratings from stakeholders.

3 Rework Percentage

Amount of work needing to be redone.



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Risk Metrics

1 Risk Exposure

Probability of a risk occurring multiplied by its impact.

2 Mitigation Effectiveness

The effectiveness of risk mitigation strategies.

3 Risk Contingency Plans

Plans to address potential risks and their impacts.

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Stakeholder Metrics

1 Stakeholder Satisfaction

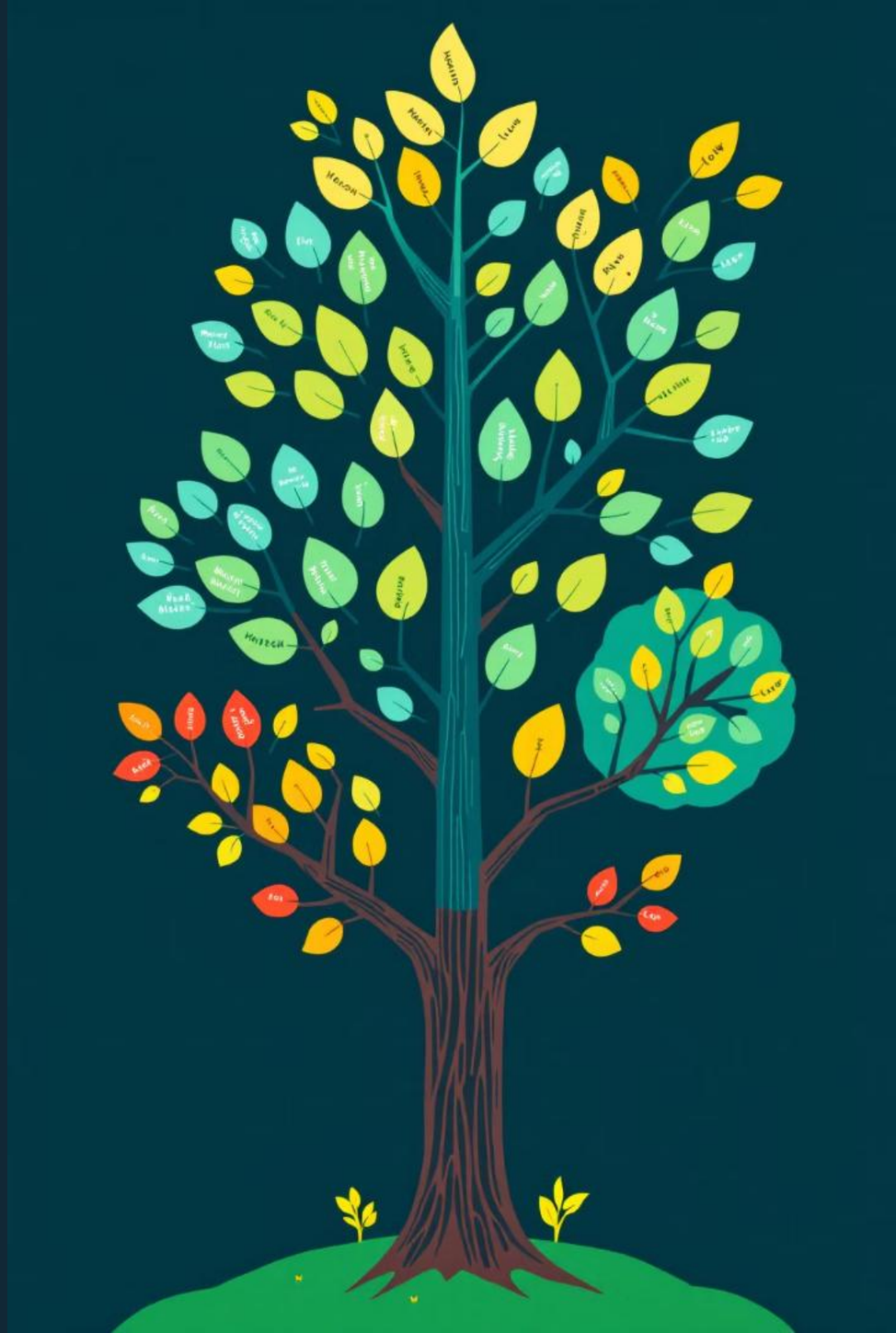
Feedback and ratings from stakeholders.

2 Communication Effectiveness

Clarity and timeliness of communication with stakeholders.

3 Conflict Resolution

Effectiveness of conflict resolution strategies.



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Capturing Lessons Learned

1 Post-project reviews

Conduct formal reviews to identify lessons learned.

2 Documentation

Record lessons learned in a structured format.

3 Knowledge sharing

Disseminate lessons learned to improve future projects.

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Continuous Process Improvement

Data-driven decisions

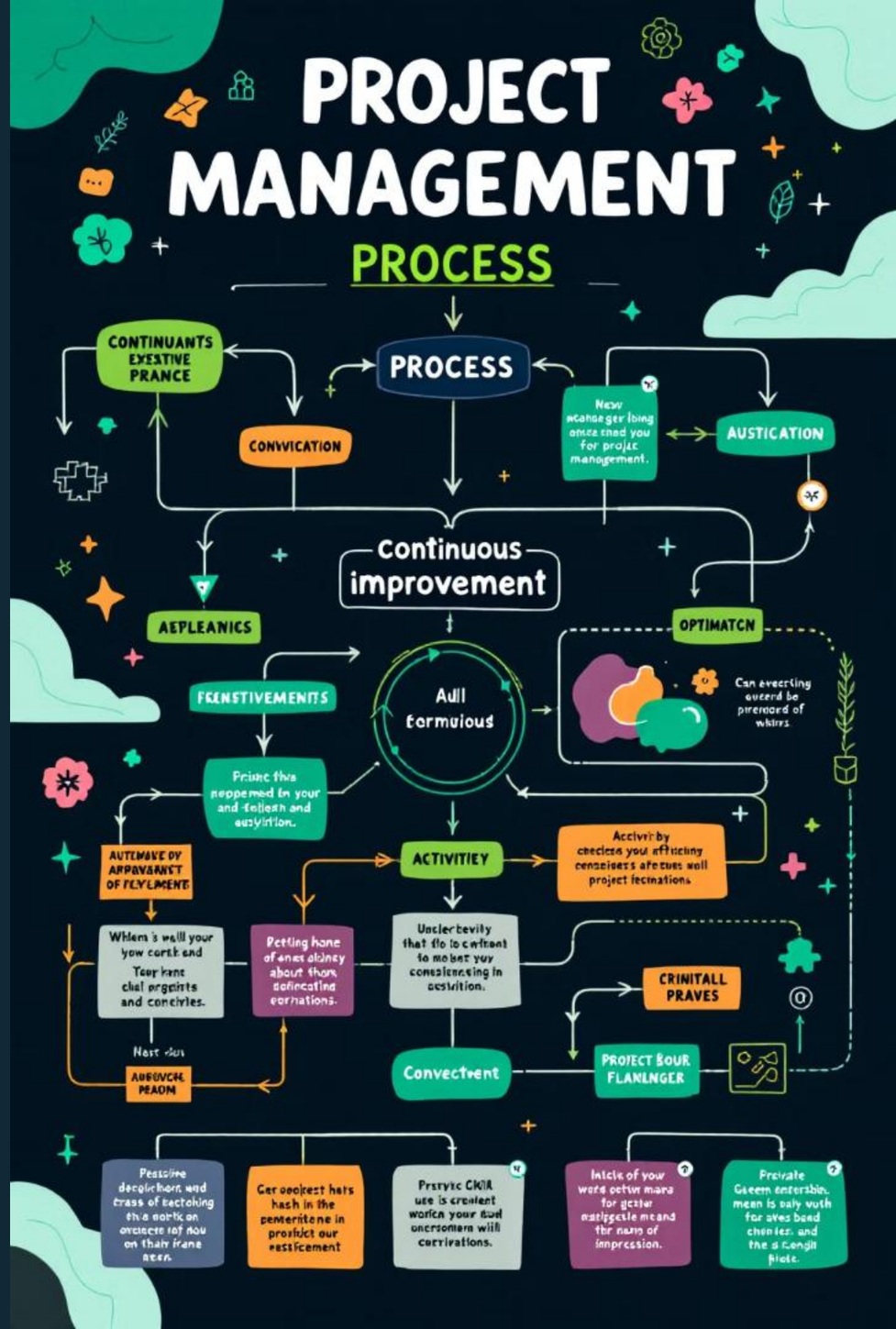
Use metrics to identify areas for improvement.

Process adjustments

Implement changes to optimize project processes.

Learning cycle

Continuously monitor, evaluate, and improve project performance.



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Aligning KPIs to Strategic Goals

1 Clear alignment

Ensure metrics support organizational goals and objectives.

2 Strategic focus

Prioritize metrics that drive strategic outcomes.

3 Performance monitoring

Track progress against strategic goals using KPIs.

Visual Controls

1 Kaban

Used to design, managed and improved the flow of systems

- Organizations can visualize their flow of work in progress (usually displayed on a board and visible to all); what need to be done, what is in progress, what's next to be done, who is doing what?

When Applicable?

- Where work arrives in unpredictable fashion
- To deploy work immediately without waiting for other work items.

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Visual Controls

2 User Stories

Agile software development Project management tool that provides users with simple, natural language explanation of one or more features written from the end user's/customer's perspective.

User stories are not written in detail

- Its just to mentions how a certain type of work/feature will bring value to the end-user. The role of the end user and the transaction involved
- End user could be Internal or External
- Explain the interface very brief, this help in visualizing the interface to be provided and its uses.

Challenges in Measurement

1 **Data availability**

Collecting complete and accurate data can be challenging.

2 **Data accuracy**

Ensuring data quality and reliability is crucial.

3 **Data interpretation**

Interpreting data correctly and drawing meaningful insights.

Overcoming Measurement Obstacles

1 Data management tools

Use software to collect, store, and analyze data efficiently.

2 Training programs

Educate team members on data collection and analysis techniques.

3 Stakeholder engagement

Involve stakeholders in data collection and interpretation.

Measurement Pitfalls

1 Hawthorne Effect

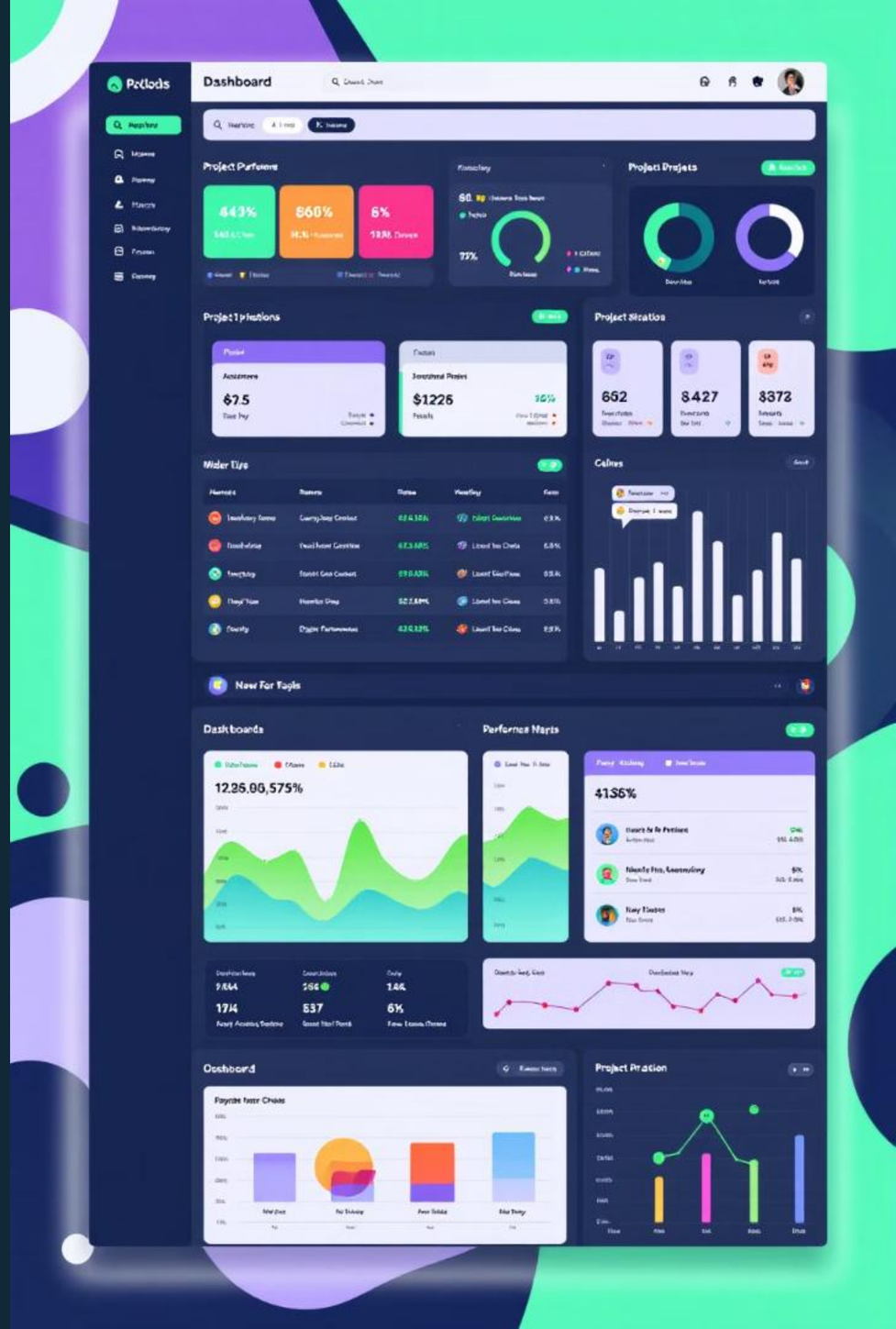
The Hawthorne effect states that the very act of measuring something influences behavior. Therefore, take care in establishing metrics.

2 Vanity Metric

A vanity metric is a measure that shows data but does not provide useful information for making decisions. Measuring page views of a website is not as result as measuring the number of new viewers.

3 Demoralization

If measures and goals are set that are not achievable, project team morale may fall as they continuously fail to meet targets. Setting stretch goals and aspirational measures is acceptable, but people also want to see their hard work recognized. Unrealistic or unachievable goals can be counterproductive.



Measurement Pitfalls

4 Misusing the Metrics

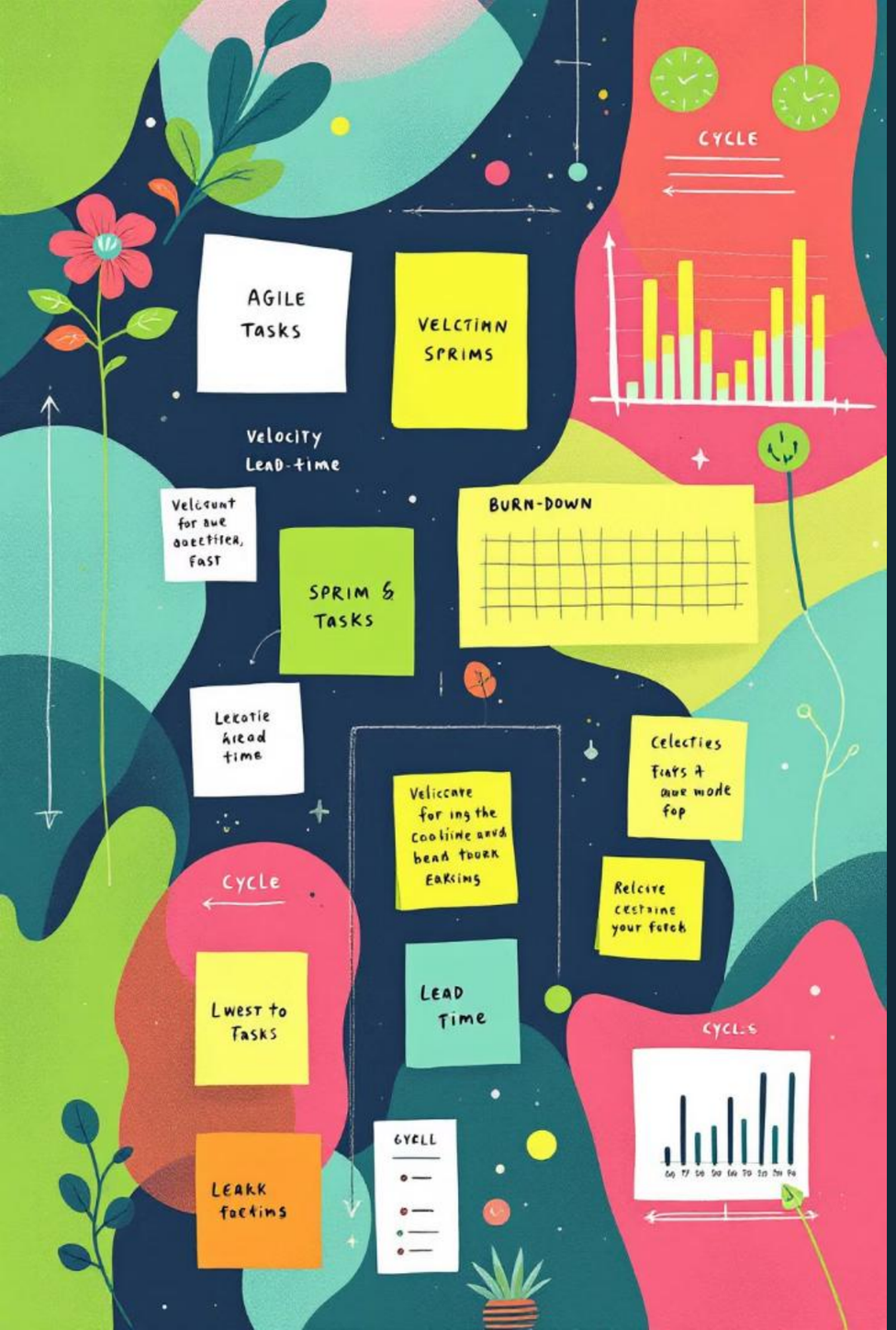
- Focusing on less important metrics rather than the metrics that matter most,
- Focusing on performing well for the long-term measures at the expense of long-term metrics, and
- Working on out sequence activities that are easy to accomplish in order to improve performance indicators.

5 Confirmation Bias

As human beings, we tend to look for and see information that supports our preexisting point of view. This can lead us to false interpretations of data.

6 Correlation Vs. Causation

A common mistake in interpreting measurement data is confusing the correlation of two variables with the idea that one causes the other.



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Integrating Measurement with Agile

1 Velocity

Measures the amount of work a team can complete in a sprint.

2 Lead Time

Time taken from request to delivery.

3 Cycle Time

Time taken to complete a task from start to finish.

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Measurement in Hybrid Project Environments

1 Combined metrics

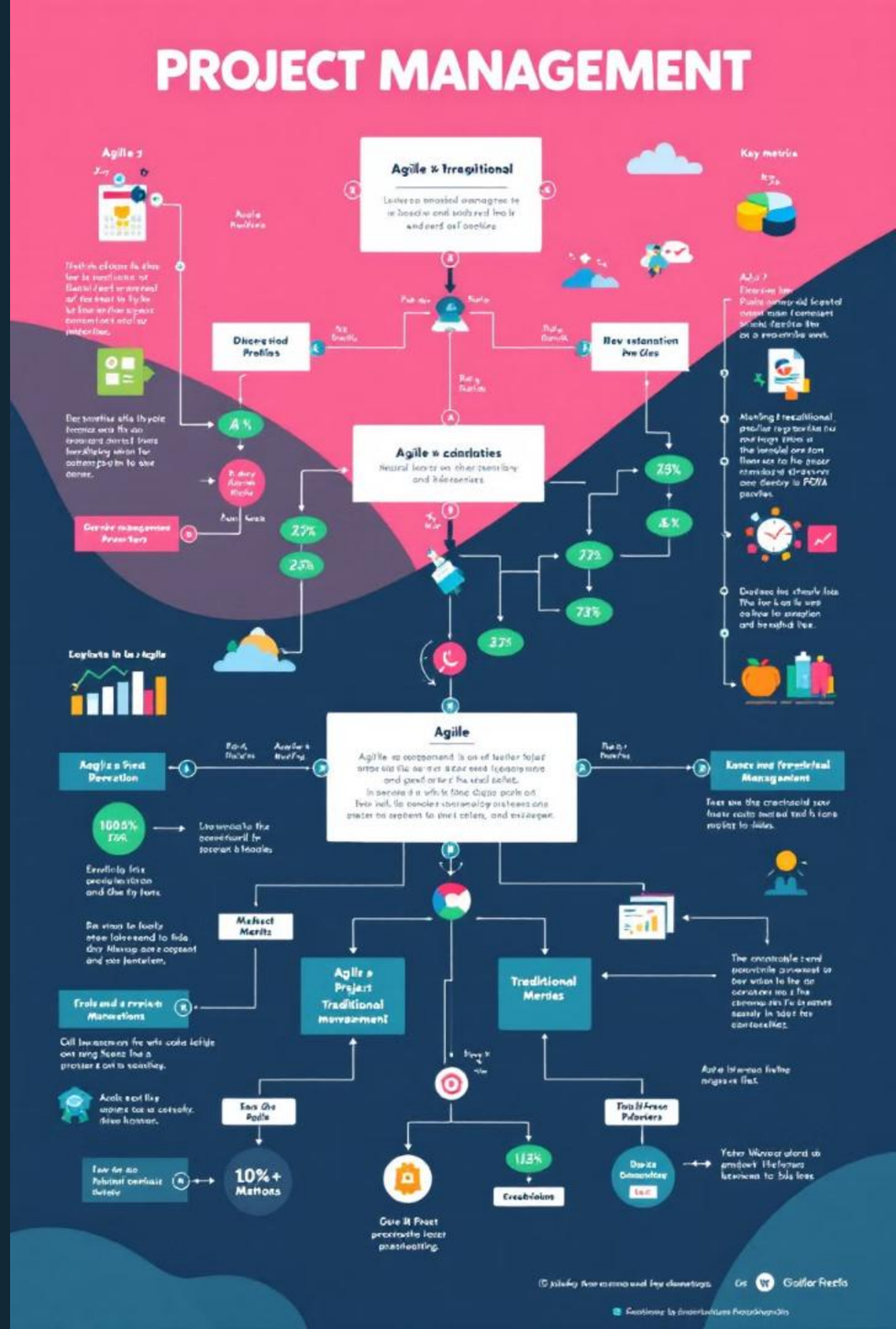
Use a blend of agile and traditional metrics to track performance.

2 Flexible reporting

Adapt reporting formats to suit hybrid project needs.

3 Iterative measurement

Continuously adjust measurement methods based on project progress.



Growing & Improving

The intent in measuring and displaying data is to learn and improve. To optimize project performance and efficiency, only measure and report information that will:

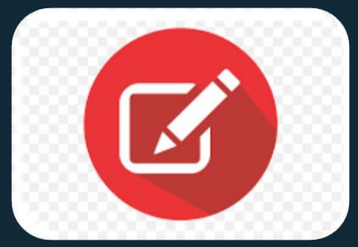
Allow the project team to learn

Facilitate a decision,

Improve some aspect of the product or project performance,

Help avoid an issue, and

Prevent performance deterioration.



Apply appropriately, measurements facilitate the project team's ability to generate business value and achieve the project objectives and performance targets.

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Key Takeaways

1 Measurement is essential

It provides insights for informed decision-making and improvement.

2 Metrics should be relevant and effective

Align metrics to project objectives and ensure accuracy and timeliness.

3 Continuous improvement is key

Use measurement to identify areas for optimization and growth.

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Interactions with other Domains

1. Planning
2. Project Work
3. Delivery
4. Stakeholder
5. Team

Checking Results

The table below identifies the outcomes from effective application of the Measurement Performance Domain on the left and ways of checking them on the right.

Outcome	Check
A reliable understanding of the status of the project	Audit measurements and reports demonstrate if data is reliable.
Actionable data to facilitate decision making	Measurements indicate whether the project is performing as expected or if there are variances.
Timely and appropriate actions to keep project performance on track.	Measurements provide leading indicators and/or current status leads to timely decisions and actions.
Achieving targets and generating business value by making informed and timely decisions based on reliable forecasts and evaluations.	Reviewing past forecasts and current performance demonstrates if previous forecasts reflect the present accurately. Comparing the actual performance to the planned performance and evaluating business documents will show the likelihood of achieving intended value from the project.