Portfolio EXPERIENCE Warsaw 2023

16th - 17th October 2023

The role of the PMO in a performance-driven portfolio management

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PMO Projects Group

Agenda

- Brief presentation
- Context and Motivation
- PMOs: history, state-of-art and future trends
- Overview of IDO Organizations
- The role of data in Project Management decision-making
- A performance-measurement based Project Management approach
- Data analytics in Project, Program and Portfolio Management
- Implications for the future PMO: conclusions and perspectives
- Questions & Answers

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Your Presenter

Alexandre Rodrigues, Eng. Ph.D PMP
Executive Partner – PMO Projects Group

- Degree in Systems Engineering (5 years) and Ph.D. in Management Sciences (specialized in Project Management)
- Over 25 years of professional international experience as a consultant and trainer in Project Management and Cost Engineering
- Senior Consultant for the Cutter Consortium, Business Agility & Software Engineering Excellence Practice (Boston, USA) (2001 – present)
- Lead Author / Core Team member for ISO21512 – "EVM Implementation Guide" (2019 – 2021)
- Founding President of AACE Portugal Section (2016 - Present)
- Named by AACE International as Liaison for the ISO21500 Technical Commission (TC258) (2017 – 2020)
- Member of the Advisory Panel of International Experts for the Government Accountability Office (GAO – USA) having reviewed the 2nd Ed of the Cost Estimating and Assessment Guide published in 2020 (2016 – 2019)
- Named by PMI to join the Core Team that developed the 1st Ed of The Standard for Earned Value Management/ANSI/PMI 19-006-2019 (2018 – 2020)
- Named by PMI to join the Core Team that developed the 2nd Ed. of the EVM Practice Standard (2009 – 2011)
- Coordinator of Portugal's Technical Commission for the ISO Working Groups for Project Management (21500), EVM (21508), and WBS (21511) (2016- 2020)
- Founding President of the PMI Portugal Chapter and Mentor of PMI Chapters in EMEA Region (2005 – 2007)
- Founding Vice-President of Operations of the College of Performance Management (CPM) of Colombia (2017)
- Member of the PMI teams at large that developed the PMBOK® Guide (3rd Ed.) and OPM3® (1st Ed.)
- PM Forum (USA) Correspondent for Portugal (2007 – 2011)
- Visiting lecturer in several Universities in Europe, United Kingdom, Australia, South America and Africa
- Supervisor and member of jury for several Master and Doctorate research studies in Project Management
- Named PM Ambassador in Portugal by the PM Forum International (USA) (2009 – 2011)
- Named EVM Ambassador in Europe by the Earned Value Management Europe Association (since 2012)

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Your Presenter comes from Portugal …

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Project and Portfolio Management

Outreach across different cultures and industries

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Sample of Major Projects

VALE

Sector : Mining, railway/port construction
Project : "Corredor Nacala"
Country : Mozambique, Africa
Budget : 4,5 billion USD
Service : Project Controls with EVM

ODEBRECHT Engenharia Industrial

Sector : Public Investment
Project : CADCA (agro-industrial)
Country : Venezuela, South America
Budget : 2 billion USD
Service : Risk Management Process

REFER EP

Sector : Public Investment
Project : railway expansion
Country : Portugal, Europe
Budget : 50 million Euro
Service : Project Controls with EVM

Caixa Geral de Depositos

Sector : Banking (Information Systems)
Project : PMO Improvement
Country : Portugal, Europe
Budget : NA
Service : PMO Processes

SAMARCO

Sector : Mining (infrastructures)
Project : PMO improvement
Country : Brazil, South America
Budget : NA
Service : Implementation of EVM system

CASAS BAHIA DEDICAÇÃO TOTAL A VOCÊ

Sector : Retail
Project : Company Reorganization
Country : Brazil, South America
Budget : NA
Service : Portfolio Management

bhpbilliton

Sector : Mining
Project : Capacity Expansion
Country : Australia
Budget : 360 million USD
Service : Project Controls with EVM

PARQUESCOLAR

Sector : Public Investment (education)
Project : ParqueEscolar (infrastructure)
Country : Portugal, Europe
Budget : 2,25 billion Euro
Service : Program Management

PT

Sector : Telecommunications
Project : "ProUno" (SAP integration)
Country : Portugal, Europe
Budget : 80 million Euro
Service : EVM-based PMO

SOUTH32

Sector : Production (Aluminium)
Project : AP3XLE
Country : Mozambique, Africa
Budget : 1 million USD
Service : Project Management & Delivery

NATO OTAN

Sector : Defence
Project : PMTTS
Country : Belgium & Holland, Europe
Budget : NA
Service : PMO Processes

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Context and Motivation

*The **extensive use of recorded data** about projects, programs and portfolios (i.e., historical databases), to enhance decision-making has been envisioned in the project management discipline **since its inception**, as demonstrated by an array of methods and techniques developed over-time – especially regarding scope, schedule, cost, resources, risk and benefits related data.*

*However, as a challenge **the full realization** of this potential has been waiting for the moment when powerful **enabling technologies**, science and business processes, would become available.*

*With the recent expansion of **Data Science** and with the rapidly emergent developments in **artificial intelligence** (AI), such moment is now unfolding, leading the way for a data- and insights-driven project management approach to develop, and, with it, immense **opportunities** for enhancing the **future role of PMOs** in organizations.*

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The Project Management Office
Evolution and Future Trends

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1. Temporary Project Support Office
within a large project aimed at executing key activities of project planning, tracking and reporting.

- *Temporary*
- *Within a single project*

2 .Permanent Project Support Office
within an organization aimed at executing key activities of planning, tracking and reporting of a portfolio of projects.

- *Became permanent*
- *Supports various projects*

3 .Permanent Project Management Office
within an organization aimed at executing **broad activities** of initiation, planning, tracking, reporting, and closure of a portfolio of projects and programs, as well as standardization of processes, tools and techniques; supporting, training, mentoring and coaching project managers; supporting top management in assessing performance and prioritizing portfolios.

- *Supports initiation and closure*
- *Supports programs*
- *Role of standardization*
- *Role in competency development*
- *Support to strategic decisions*

4 .**Permanent Project, Program and Portfolio (P3) Management Office (xMO)** within an organization aimed at delivering various P3 **services** with a shift of focus towards **value delivery** across the organization and the business activity.

- *A service-based model*
- *Focus on value delivery*
- *Participation across the whole organization*
- *Participation in business activities*

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The Project Management Office
Evolution and Future Trends

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- *While PMOs across organizations around the world have many common traits, their structure, positioning in the organization and even names vary, showing that there is no standard model for a PMO: instead, they address and continuously adapt to the specific and dynamic business needs of organizations.*

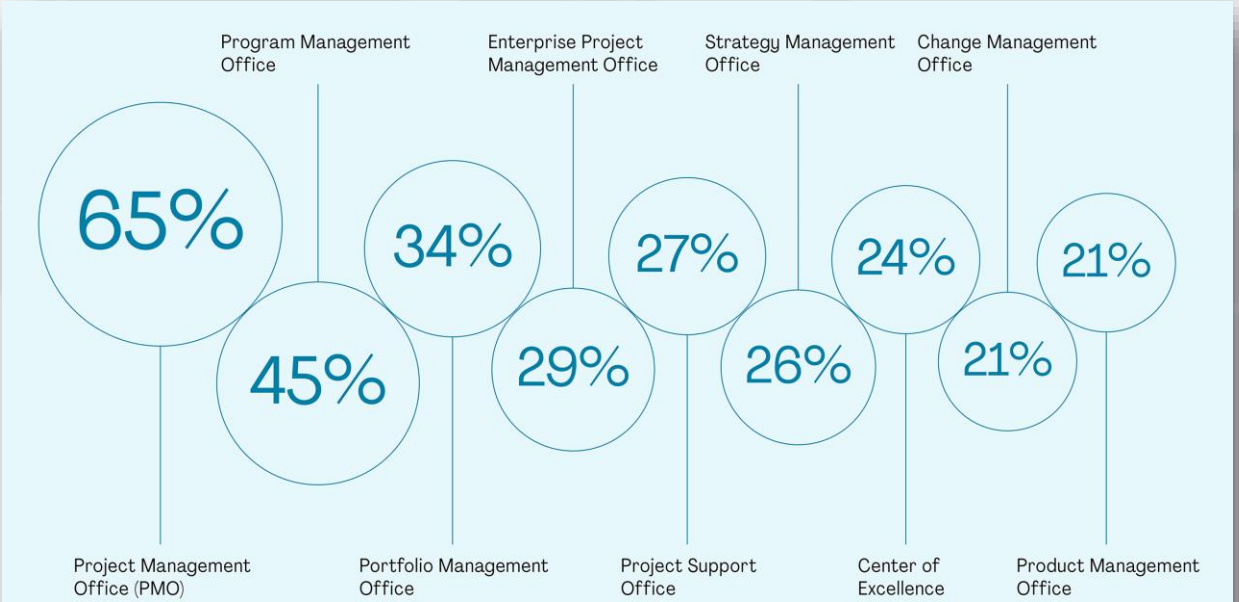

Figure 1: Common Names for PMO/Support Offices

Source: PMI and PwC Global Survey on Transformation and Project Management 2021.

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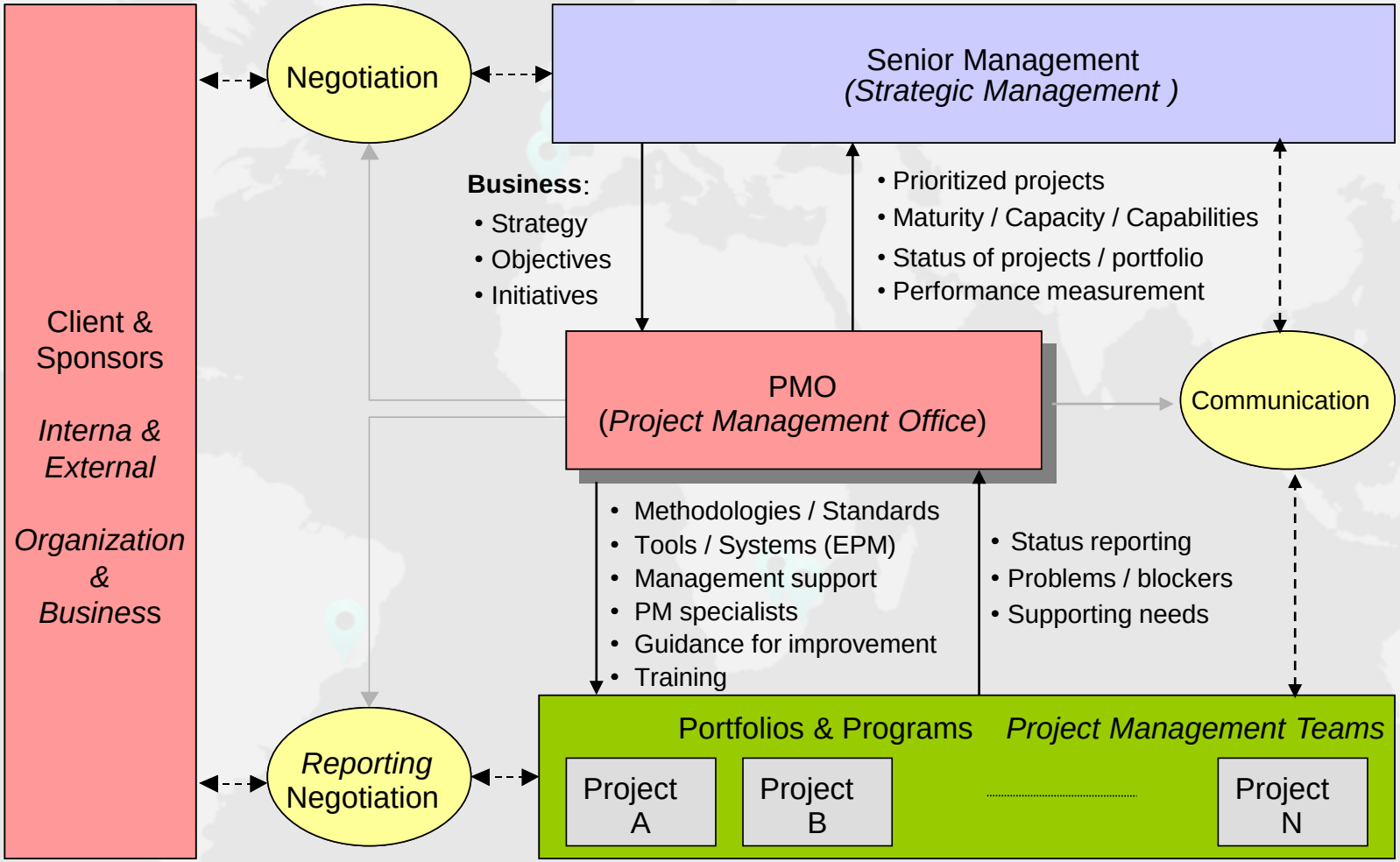
The Project Management Office
Evolution and Future Trends



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The Project Management Office
Evolution and Future Trends

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Performance-measurement driven Portfolio Management

- Data-driven (data analytics)
- Insights-driven (AI)

The PMO of the future

(*enhanced by projects data analytics & AI*)

Value Delivery

- Strategic alignment
- People & Culture
- Flexible & Adaptable

Standard Processes

- Initiation
- Planning
- Execution
- Control
- Closure

Systems and Tools

- Integration
- Analytics
- AI

Metrics, Data and Reports

- Extensive Databases

Controls

- Scope
- Schedule
- Cost
- Quality
- Risk
- Resources

People

- Training
- Mentoring
- Coaching
- Culture

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IDO Organizations

Data and Insights-Driven Decision-Making

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- The use of data to make informed decisions has always been sought by organizations to manage their businesses – data, where available, has always been the “eyes of management”.

- Since the early XXI century, the accelerated technological advances in data storage, processing, and analysis, enabled organizations to make a broader and more effective use of the data they collect and acquire about their business activity.

- While the term “Data Science” has been in use since as early 1960s, due to these advances, it has recently gained a new and broader arena as a discipline of its own, equipped with new tools and techniques, allowing organizations to use big data as a major pillar of their business models and strategy.

- Nowadays, organizations are striving to use data and insights daily and at all levels to manage and execute their business activities.

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IDO Organizations

Data and Insights-Driven Decision-Making

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- The collection of data, its analysis, and insights generation has been leading to transformations of the business models towards what is nowadays referred to as **insight-driven organizations (IDOs)**.

- An Insights Driven Organization uses data analytics possibly coupled with artificial intelligence (AI) to improve decision-making, by **interpreting data to produce meaningful insights** that can inform business strategy and operations.

- The **use of data analytics and AI in Project Management** is not an exception, as the Project Management discipline has since ever been itself based on the intensive use of data collected from on-going projects, past projects, and even projects from other organizations.

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IDO in Project Management

The role of data in decision-making

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- Since its inception, the Project Management discipline has rooted its principles on the use of data and on scientific tools and methods based on measurement.
- The critcal path method and analysis (CPM) was developed in the early 50s due to the advent of computational power, together with PERT analysis which uses statistics, and Earned Value Management (EVM) followed in the 60s making use of predictive models for trend analysis.
- Project risk analysis makes intensfive use of statistics and computer simulation, integrating cost, scheduling and resource models.
- Parametric models based on regression analysis, and statistical range analysis, are commonly used for cost, schedule and resource estimation, and for risk quantification.
- The **EVM method**, which became to be the **backbone of a performance-measurement** based approach to the management of projects, is the source of consolidated metrics and performance indices aimed at informing decision-making through measurement, diagnosis and trend analsis of project performance and likely project outcomes.

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IDO in Project Management

The role of data in decision making

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- Nowadays, most organizations that implement significant portfolios of projects on an on-going basis, especially CAPEX investment projects, maintain an array of software applications and databases related to the various areas of project management including:
  - Business Information Modelling (BIM)
  - Schedule planning and control
  - Cost estimating, budgeting and control
  - Resource planning and control
  - Risk Management
  - Project finance and accounting
  - Procurement management databases to support cost estimating and contracting
  - Asset management and reliability management to select new projects
- All these applications and systems include databases with different types of data and reports about past and on-going projects, which is intended to be used for decision-making mainly in planning and control.
- The integration of all this data, as well as maintaining its consistency and quality is a major challenge. Yet, **this data constitutes a major *organizational asset*.**

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IDO in Project Management

The role of data in decision making

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Past Projects & On-going Portfolios

Data Collection & Storage

Business Information Management (BIM)

Cost Estimating

Resource Planning and Control

Scheduling System

Accounting System and Financial Control

Performance Management System (EVMS)

Risk Management System

Portfolio Management

Decision-making for

On-going Projects

Project Management Data Analytics

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Performance-driven Approach

EVM as the integrative enabler

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- Introduced in the early 60s in the US DoD, it developed from the need to better manage increasingly complex defence programs, including at that time 35 performance criteria for cost/schedule performance.

- It was developed to help the Project Owner in monitoring the performance of large project contracts. The contractor was responsible for implementing the EVM system which would be audited by the Project Owner. Contract performance as reported by the EVM system would then be used as input information to manage payments.

- The central idea of EVM is to value the work scheduled and the work performed, or *earned*, according to the approved budget (baseline), and compare to the actual cost.

- Overtime EVM has gained the two-fold reputation of being the most accurate and *de facto* standard for project controlling, as well as being potentially complex and requiring a high degree of project management maturity from the organizations using it.

- Various standards have been developed over-time, with a tendency for a shift of the use of EVM towards the private sector with an emphasis on managing project performance.

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Standards, Certifications and Organizations

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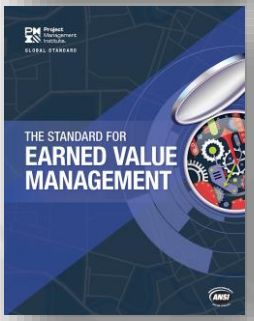
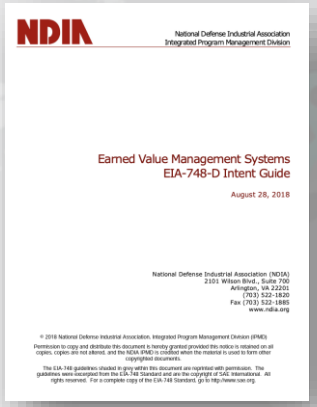
Project Management Institute



NDIA National Defense Industrial Association Integrated Program Management Division



APMG International

Earned Value — FOUNDATION — APMG International

Earned Value — PRACTITIONER — APMG International

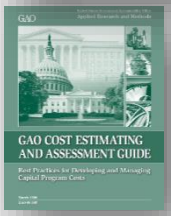
ISO

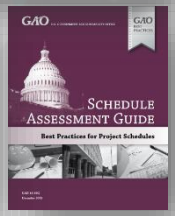
ISO/AWI 21508
Earned Value Management

AACE INTERNATIONAL

CERTIFIED aace international EVP

GAO





CPM College of Performance Management

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"Making Better Decisions with Better Information"

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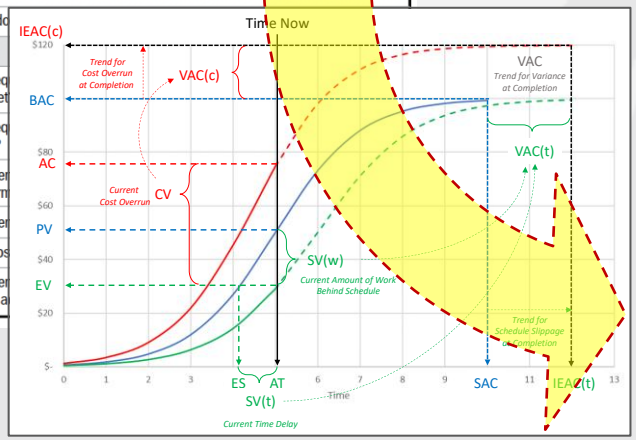
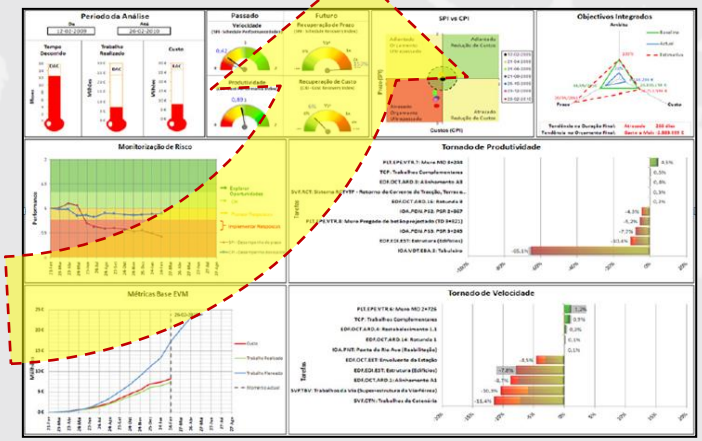
EVM Metric	Description	Management Question
Baseline:		
BAC	Budget at completion	What is the currently approved budget?
SAC	Schedule at completion	What is the currently approved schedule?
Current Status:		
PV	Planned value	How much work is planned to be accomplished?
EV	Earned value	How much work has been accomplished?
AC	Actual cost	How much cost has been incurred to date?
ES	Earned schedule	How much time was planned for the amount of work accomplished?
AT	Actual time	How much time has elapsed?
CV	Cost variance	How much is the project overspending or underspending?
SV_w	Schedule variance (work)	How much work is ahead or behind schedule?
SV_t	Schedule variance (time)	How much time is the project ahead or behind schedule?
CPI	Cost performance index	How much work is being accomplished for every unit of currency spent?
SPI_w	Schedule performance index (work)	For the time elapsed, what is the actual work rate against the baseline?
SPI_t	Schedule performance index (time)	For the work do
Future:		
TCPI	To-complete CPI	What is the req specific budget
TSPI	To-complete SPI	What is the req specific time?
IETC	Independent estimate to complete	What is the tren its past perform
IEAC	Independent estimate at completion	What is the tren
ETC	Estimate to complete	What is the cos
EAC	Estimate at completion	What is the tren management a

	SPI < 1 (behind schedule)	SPI > 1 (ahead of schedule)
CPI < 1 (above budget)	*Underestimation?* *Unexpected scope complexity?* Potential actions: • Descope the project • Increase budget/schedule (when TCPI and TSPI are high)	*Overresourced?* *Work executed out of sequence?* Potential actions: • Reduce resources • Rebaseline for early completion • Control work out of sequence
CPI > 1 (below budget)	*Underresourced?* *Value engineering?* Potential actions: • Increase resources • Rebaseline to extend the schedule (if TSPI is very high)	*Overestimated?* *Scope simpler than expected?* *Effective risk management?* Potential actions: • Expand the scope and/or quality • Plan additional risk responses to reduce project risk • Rebaseline for early completion and release budget





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Earned Value Management

Relationship with Project Data Analytics

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Earned Value Management (EVM)

Management Questions

1. What: Is the project behind schedule? By how much? In what areas of scope?

2. Why: What type of work has been contributing most to the delay?

3. Future trend: Given current past performance, what is the trend for the project completion date?

4. Actions: What-if the schedule is re-baselined by 10% and resource capacity increased by 20%? What amount of the initial scope can be accomplished?

Data Analytics

4 types of outcomes

1. Descriptive Analytics: examining past data to understand what has happened.

2. Diagnostic Analytics: aims to understand why something happened identifying the root causes of a particular outcome.

3. Predictive Analytics: involves using historical data to predict future outcomes.

4. Prescriptive Analytics: recommending specific actions to optimize outcomes, generating actionable insights.

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Performance Analysis and Management Action

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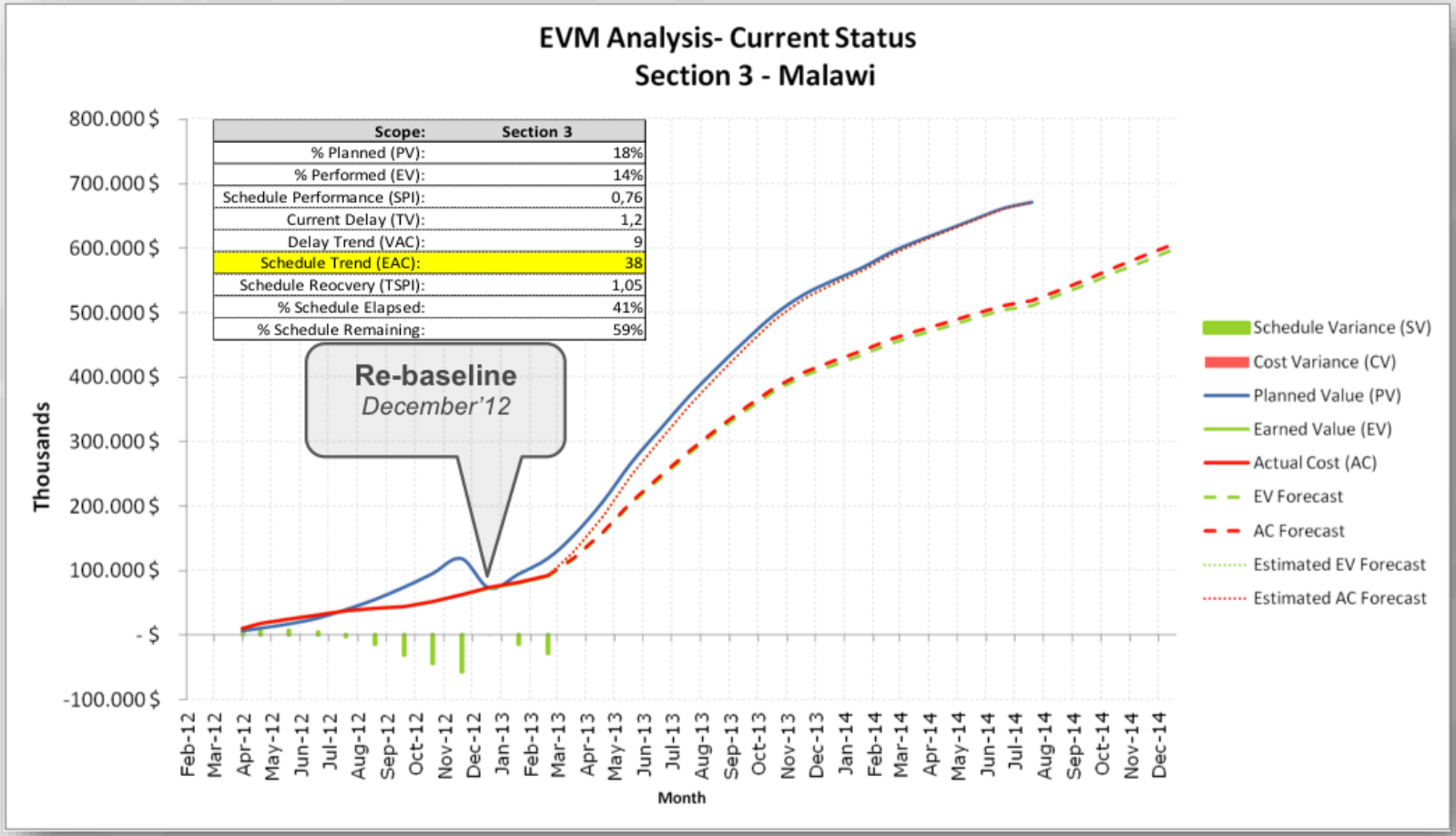

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Performance Analysis and Management Action

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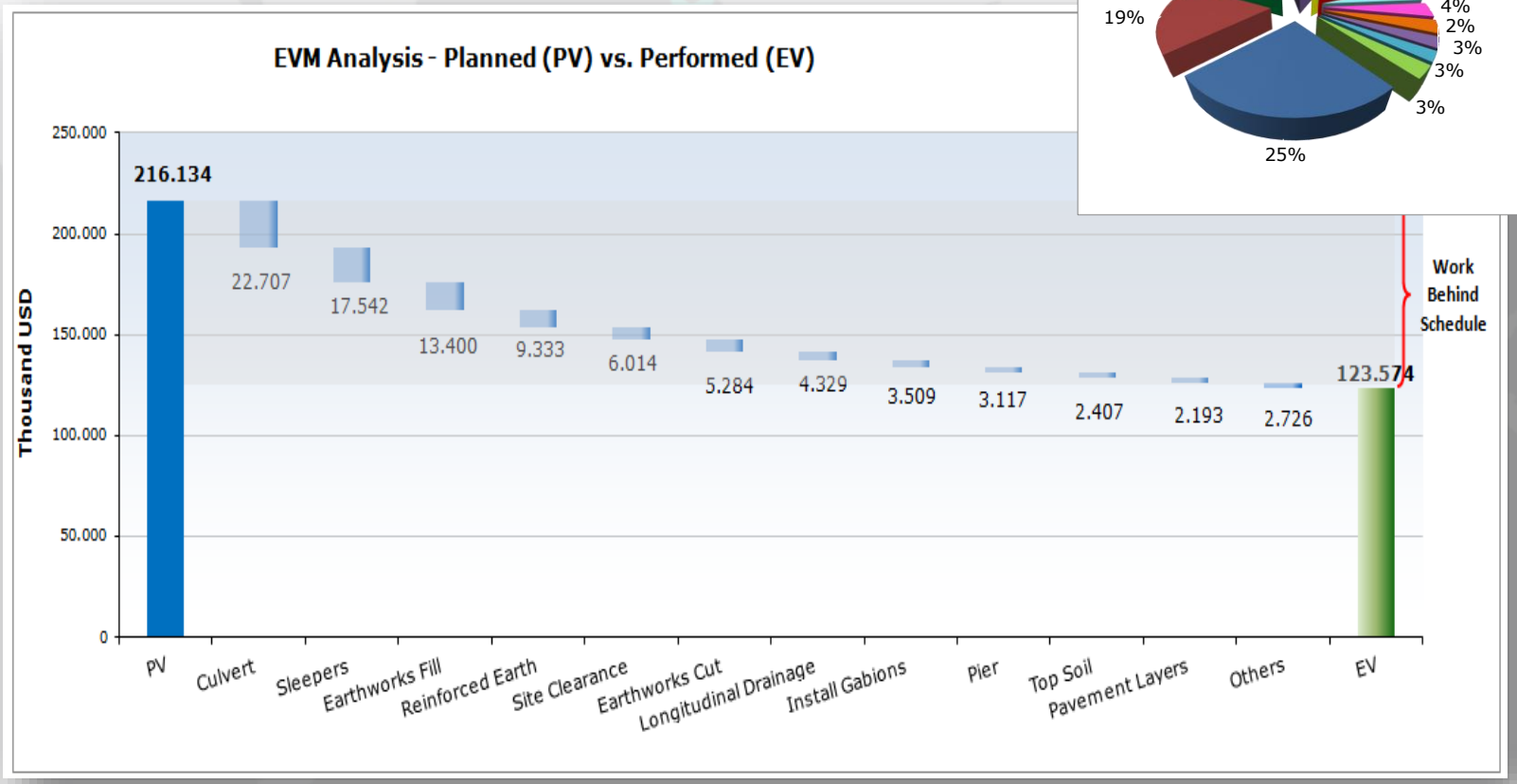

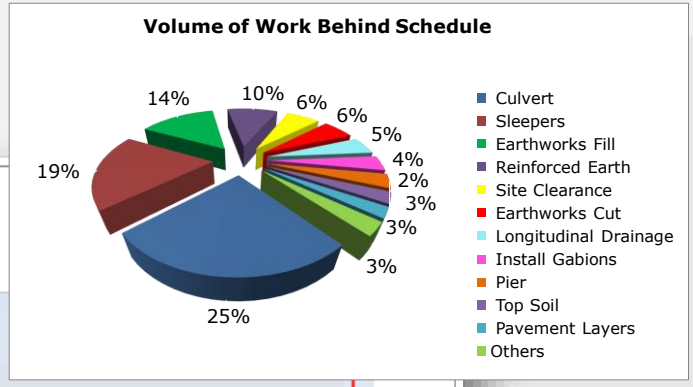

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Performance Analysis Dashboards

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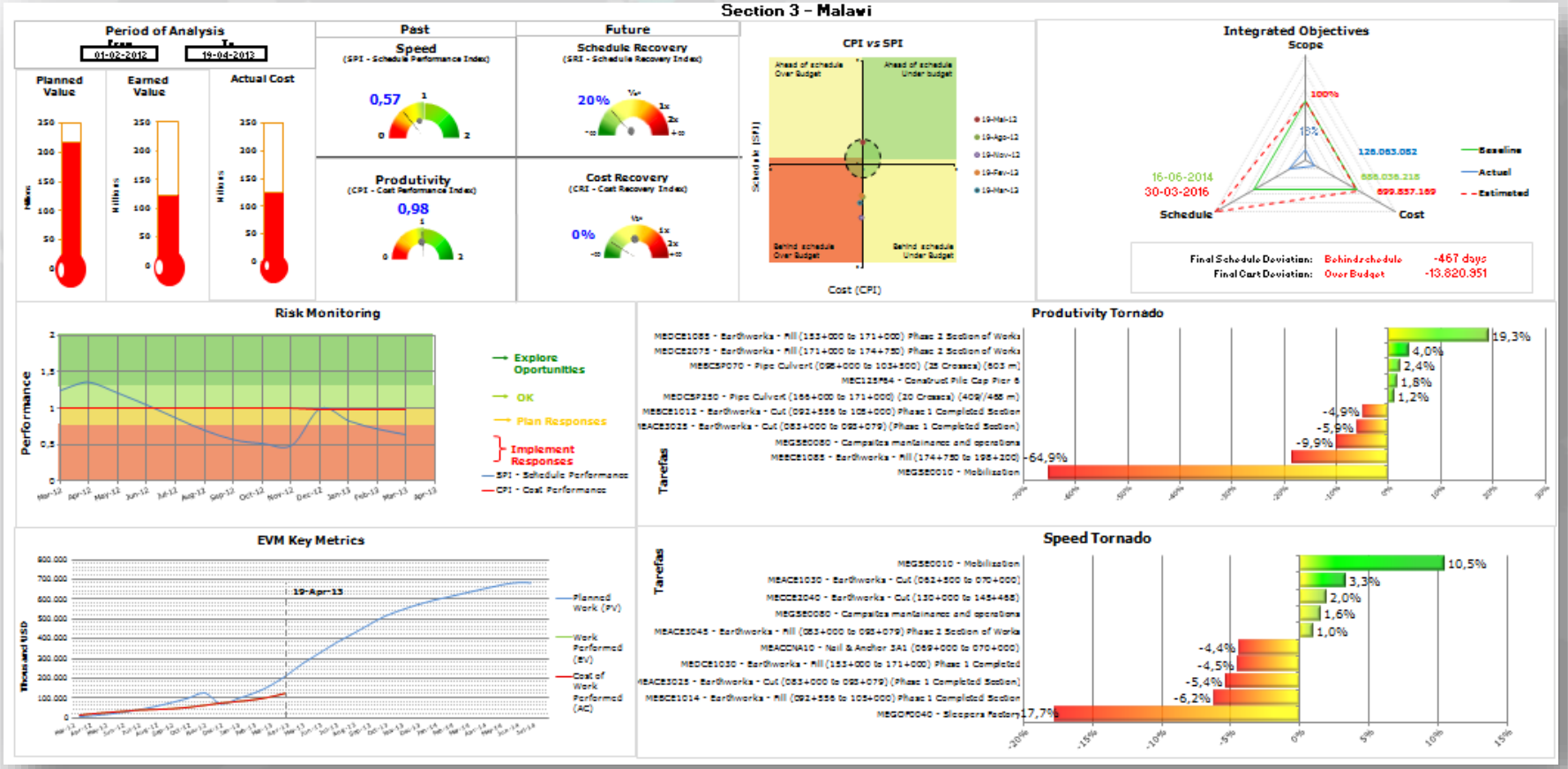

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Extension to Programmes and Portfolios

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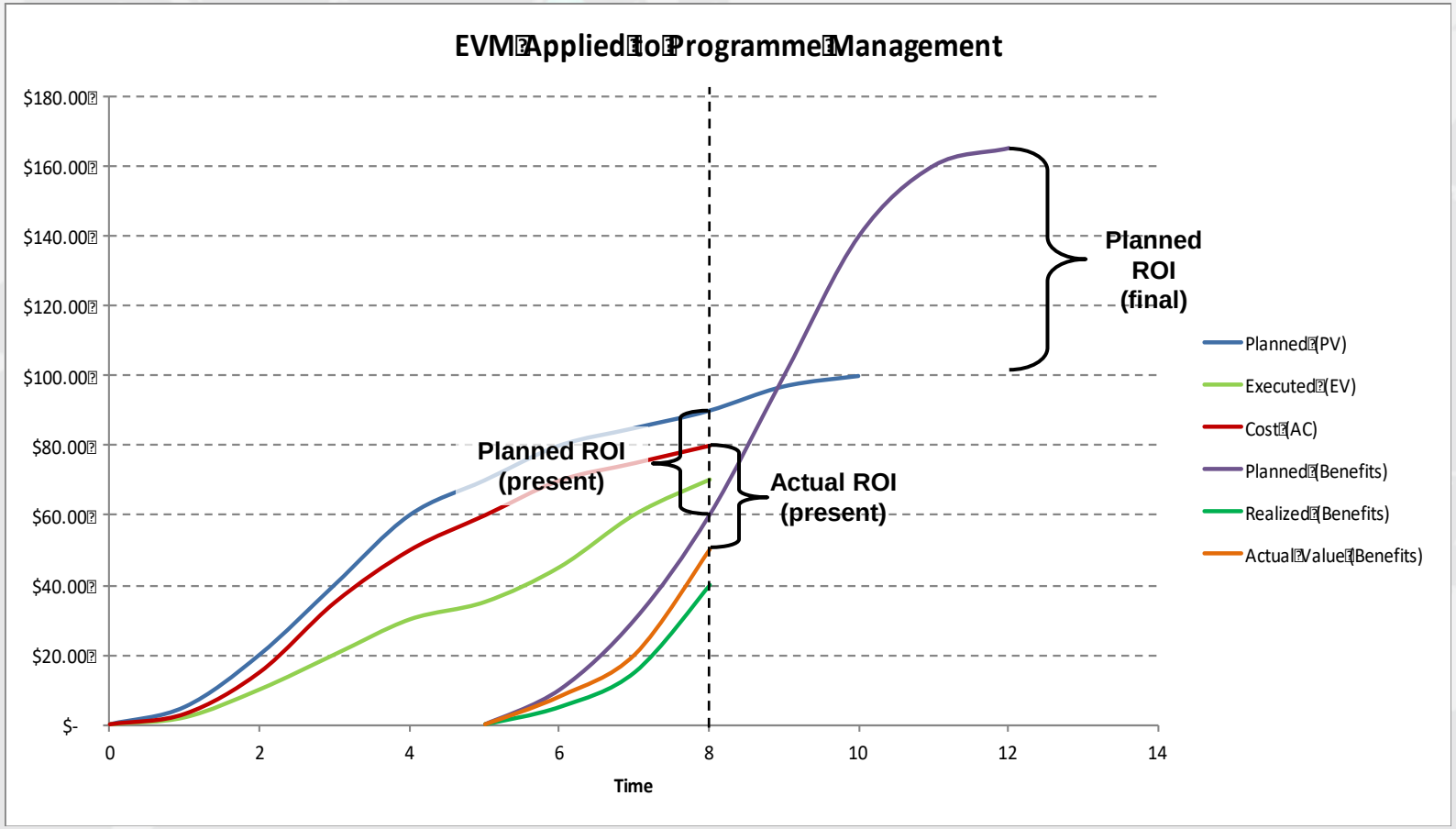

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Earned Value Management

Extension to Programmes and Portfolios

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Basic Metrics			Valor
Budget / Cost (Traditional EVM)			
	PV	*Amount of work planned*	£ 100
	EV	*Amount of work accomplished*	£ 80
	AC	*Cost of work accomplished*	£ 90
Benefits Realization			
	PB	*Benefits planned to have been achieved*	£ 120
	RB	*Realized benefits (nominal value)*	£ 100
	AB	*Real value of the benefits achieved*	£ 110

Performance Indices			
Cost and Time Performance (Traditional EVM)			
	SPI	*Rate of work accomplishment*	80%
	CPI	*Efficiency of the budget consumed*	£ 0,89
Benefits Performance (Programme Perspective)			
	BPI	*Rate at which benefits are accomplished*	83%
	VPI	*Value of realized benefits*	£ 1,10
Return on Investment (Portfolio Perspective)			
	PROI	*ROI planned to have been achieved*	£ 1,20
	AROI	*ROI actually achieved*	£ 1,22

Calculation of the performance indicators

Interpretation of the Performance indicators

Model - EVM-SM™			Budget / Cost					Benefits				
			PV		EV	AC		PB		RB		AB
Budget / Cost	PV	£ 100	-	-	-	-	-	-	-	-	-	-
	EV	£ 80	SPI =	80%	-	CPI =	£ 0,89	-	-	-	-	-
	AC	£ 90	API =	90%	-	-	-	-	-	-	-	-
Benefits	PB	£ 120	PROI =	£1,20	-	-	-	-	-	-	-	-
	RB	£ 100	-	-	-	-	-	BPI =	83%	-	-	-
	AB	£ 110	-	-	-	AROI =	£ 1,22	-	-	VPI =	£ 1,10	-

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Extension to Programmes and Portfolios

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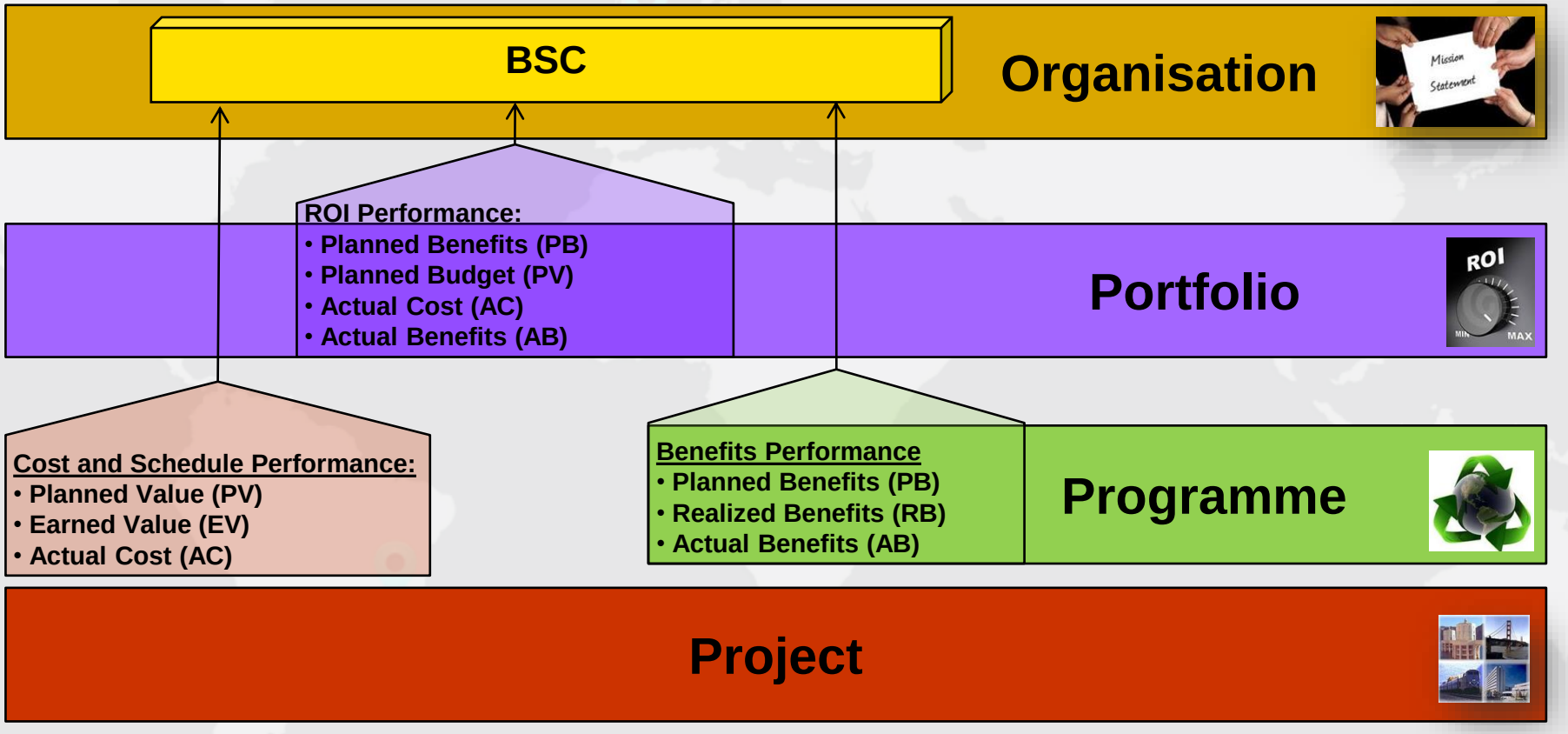

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Use of data analytics in PM

Examples in performance management

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- Q1: What are the thresholds in performance variance analysis that should trigger management action?
- Q2: Is the project likely to meet its objectives given its current performance and level of progress (by comparison with similar past projects)?
- Q3: Given current performance and materialized risks, what are the most important risks laying ahead in the project?
- Q4: What are the likely causes of current performance and what are the possible management actions that may improve performance in the future?
- Q5: Was the project successful by comparison with similar projects that faced similar challenges?

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Conclusions and Way Ahead

- Decision-making in all areas of management and business activity will be increasingly based on big-data analytics and insights. Project, Program and Portfolio (P3) Management is no exception.

- Since its inception, the Project Management discipline is akin to a data-driven decision-making approach, having developed various methods and techniques that extensively produce and use data.

- Among these, EVM was developed as an integrative method that delivers performance metrics and indices to inform project, program and portfolio decision-making.

- Managing projects and portfolios implies considerable data collection and data storage over-time in various software applications and systems. Most project-based organizations currently maintain large databases of project data, thereby hold an immense potential for using data analytics capabilities in the management of their portfolios.

*This combination of **data analytics capabilities**, the **availability of performance-measurement (EVM)** based project management, and the current **focus of PMOs on value delivery**, it will affect how the PMO of the future will be evolving in **its role** and adapting its **operational model** to address the business needs of organizations.*

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Thank you!

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Conference Theme: "The PMO of Tomorrow"

The role of the PMO in a performance-driven portfolio management

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