

PM10: Do you suffer Managing Multiple Projects?

A panoramic view of the Seattle skyline at dusk or dawn, with the city lights and the waterfront visible. The word "Seattle" is overlaid in large yellow letters.

# Seattle

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at the Sheraton Seattle Hotel

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AACE International's 53<sup>rd</sup> Annual Meeting

Seattle, Washington

# Do you suffer Managing Multiple Projects?

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**Graduate : 1984 ( Engineering)**

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## Other Activities:

- International Grader in aacei for PSP Exams
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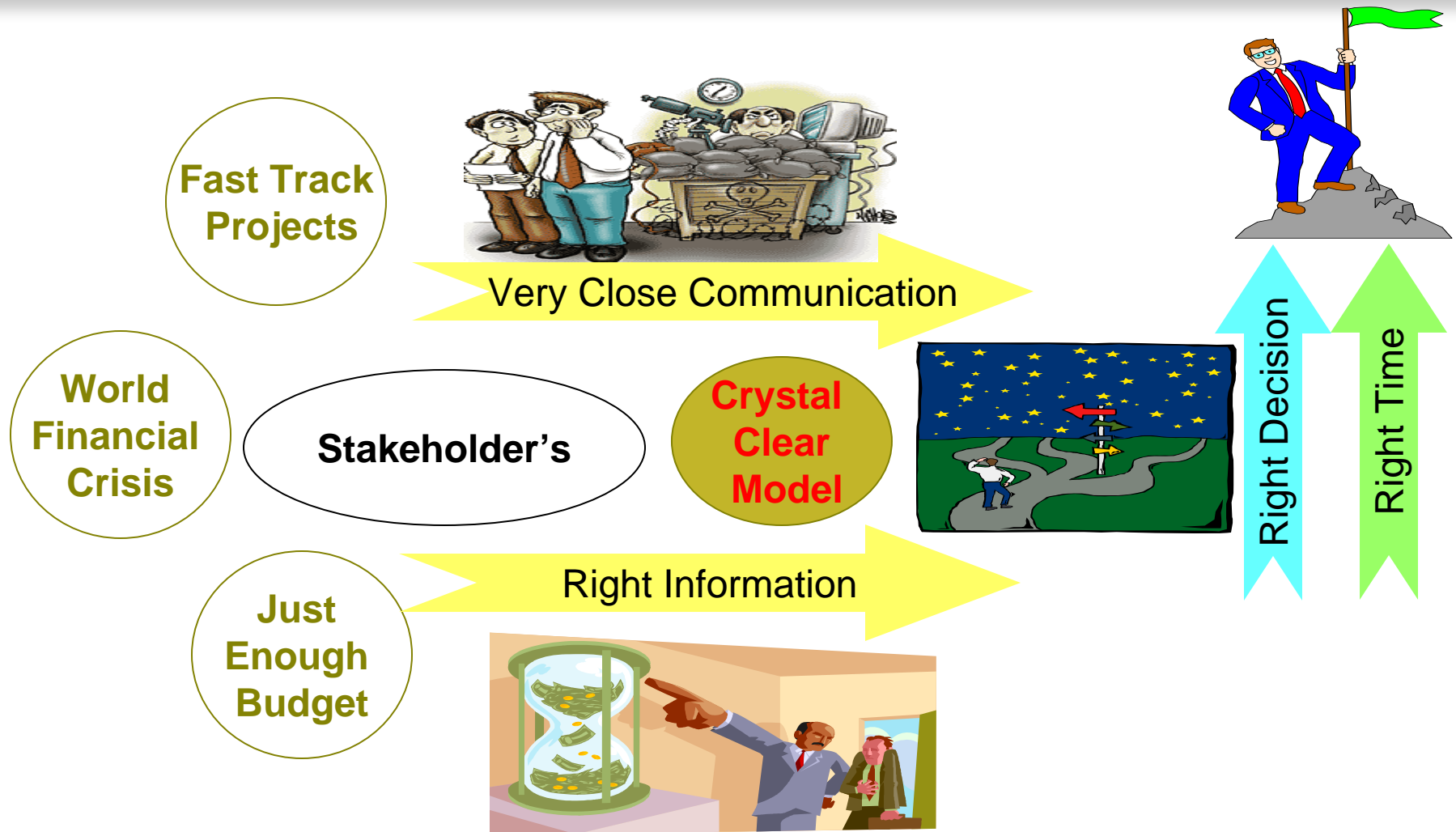
## Presentation Agenda:

- **Introduction**
- **The Problem**
- **Presentation Objectives**
- **The Body Of Knowledge**
- **Conclusion**
- **Open Discussion**

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# Introduction

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# The Problem

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**In today's business world,**

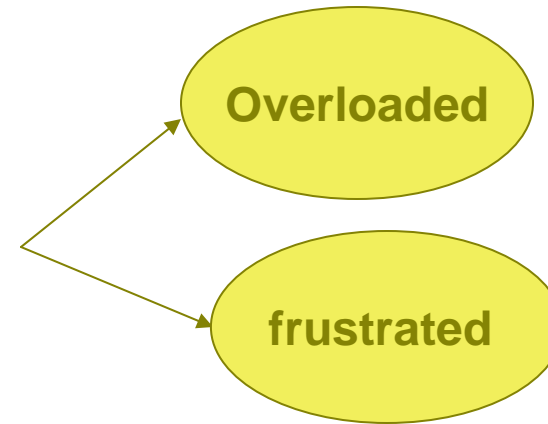
**it's not uncommon to see  
project managers**



**handling**



**many projects**



**Despite:**

- their complexities,
- tight schedules, and
- tight budget as well.

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- Properly managing this case is the

**biggest challenge** for an organization

because it is a complicated process that could:

- **affect business decisions** and
- **actions taken.**

*is based on*

- **Proper Reporting Information**
- **Timely Reporting Information**



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## Objectives

## Do you suffer Managing Multiple Projects?

- 1- To help establish effective and simplified approach/model for overall projects key indicators.**
- 2- To help establish effective and simplified approach/model for projects data collection.**
- 3- To help develop benchmarking curves depicting areas of effectiveness and leading to improve efficiency toward accurate forecasts and relevant decisions.**
- 4- To help better understanding areas of both strengths and weaknesses that could affect business results.**

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## **The Body Of Knowledge**

# Do you suffer Managing Multiple Projects?

## 1-Establish effective and simplified approach/model for overall projects key indicators

The new approach is called

" **Key Performance Indicators (KPI)** ", KPI are either **financial** or **non-financial** measures or metrics

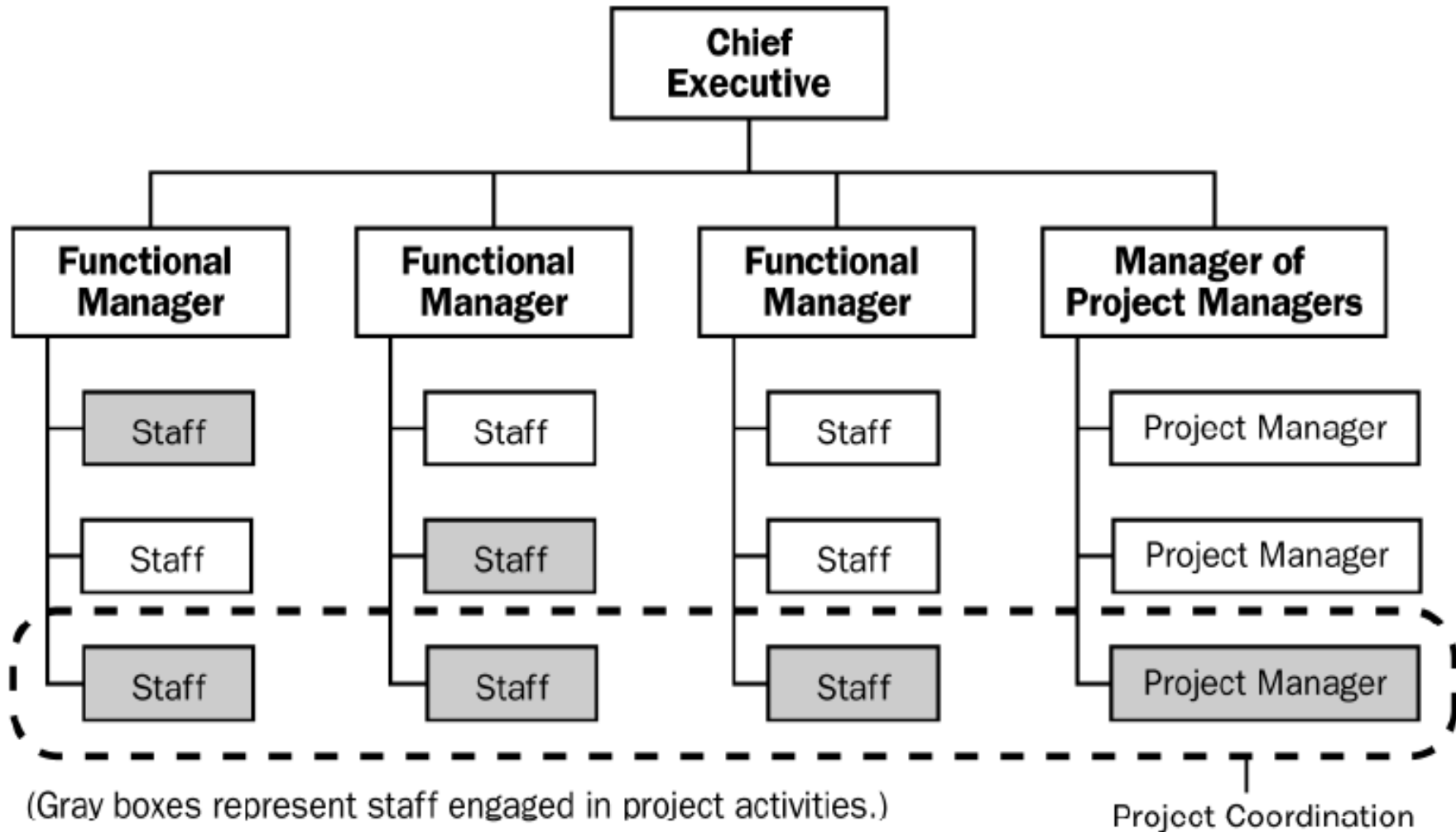
used to

help an organization

**evaluate how successful it is,**

in terms of making progress towards meeting its **long-term** organizational **goals**.

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## KPI No. 1:

# Time Productivity

This key indicator will measure the  
team effectiveness and efficiency  
in meeting  
milestones

and will reflect the  
**overall department situation**  
concerning its commitments towards clients.

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In order to get the KPI for milestones performance:

1- We have to fix certain major milestones to measure against it for all projects,

*for example: let us fix 6 milestones for all projects in the project management department, such as:*

- Advance Payment/Start date
- Mobilization date
- Preliminary Handing over date
- Commissioning and start up date
- Final Handing over date
- Warranty End date

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### 2- Allocate milestones on time for multiple projects.

This will result in getting different dates to be targeted which would hit every month or quarter.

3- If any milestone has achieved on time or earlier its is 100% (1 score) achieved else 0% (0 score)

4- Consider a cutoff date line (monthly or quarterly)

5- Sum the total number of milestones allocated per month

6- Sum the total number of milestones scored 1
















7- Time Productivity = 
$$\frac{\text{Total No. of Milestones scored 1}}{\text{Total No. of Milestones allocated}}$$

**per period**





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## Time Productivity KPI

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Project 1	  Advance Payment  Mobilization		 Preliminary Handing over Milestone	 Commissioning Start up Milestone
Project 2	  Preliminary Handing over Milestone	 Commissioning Start up Milestone		 Final Handing over Milestone
Project 3	 Final Handing over Milestone 			 Warranty End Milestone
Project 4	  Warranty End Milestone		 Milestones Continued	

Cutoff date 31 March 2009

 Target  
 Actual

$$\text{Time Productivity} = \frac{\text{Total No. of Milestones scored } 1 = 3}{\text{Total No. of Milestones allocated } 5} = 60\%$$

Target > 90%

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## 60% is the Time to Customer Delivery Efficiency

- This will direct the Manager of Project Managers attention to investigate the reasons behind such low productivity, for taking the corrective actions.
- More analysis can be performed to explore the problem in more details such as:
  - % of received advance payment,
  - % Mobilization Productivity and so on.

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The Main Purpose of this new approach is that:

The project managers head shall not interfere as long as the results are **satisfactory** but he would only when the results show low percentages than target or early warning signs occurred showing deterioration

**This will allow him for**  
**better time management**  
**and**  
**better effectiveness**  
**to other issues.**

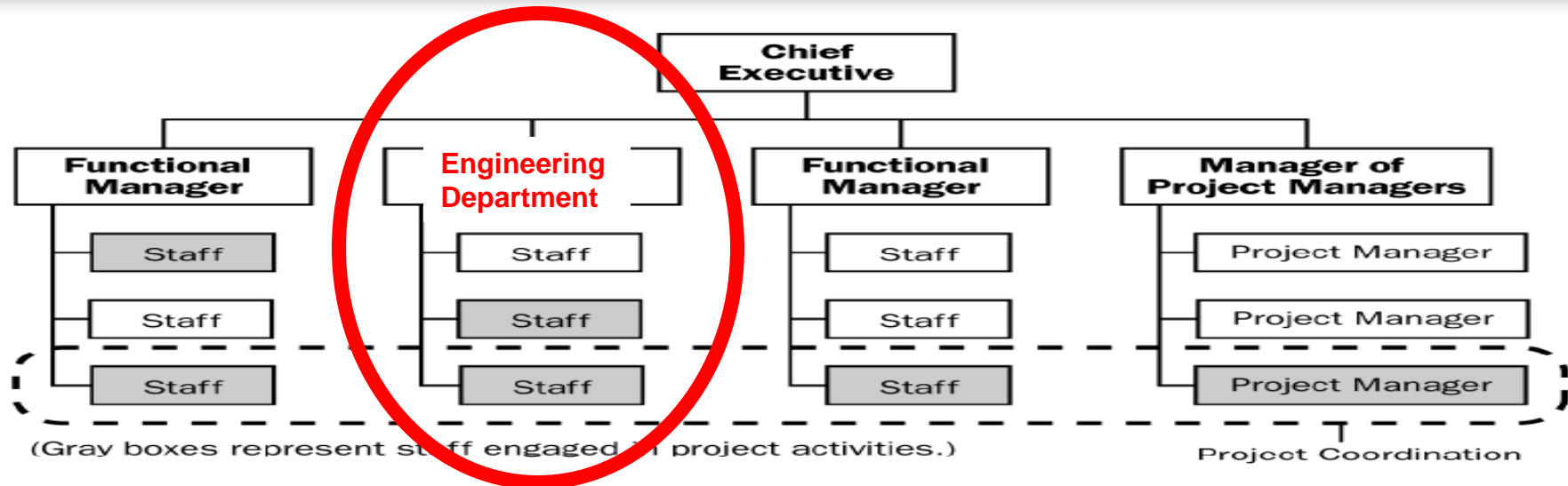
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## KPI No. 2:

# Manpower Utilization

- *The following concept can be implemented to a wide range of applications among all company **hierarchy levels** for **better management understandable** about its **staff utilization**.*
- *This concept is also useful for **services or engineering companies** as the **manpower is the main resource for generating business revenues**.*

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- The engineering dept. is one of the major supportive functions for projects dept. and any delay in the engineering process will be reflected automatically on the overall performance of projects.
- The dept. head wants to measure his resource utilization in order to determine if his staff is committed to the department targets let us say not less than **80 % utilization.**

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### The following steps are to generate the resource utilization KPI :

1- Calculate the number of resource per month (assume 46 Engineer)

2- Calculate the working days per month

Example: January 2009

Working Days = 31 days – 10 days weekend (5 weekends) – any official holidays (3 days)

3- Calculate the number of AVAILABLE days for all department resources:

No. of available days = 46 engineer x (31-10-3) = 828 man day/month

4- Calculate the actual working days less January : permissions 50 man days, sick leave 150 man day, Annual leave 70 man day for the whole department

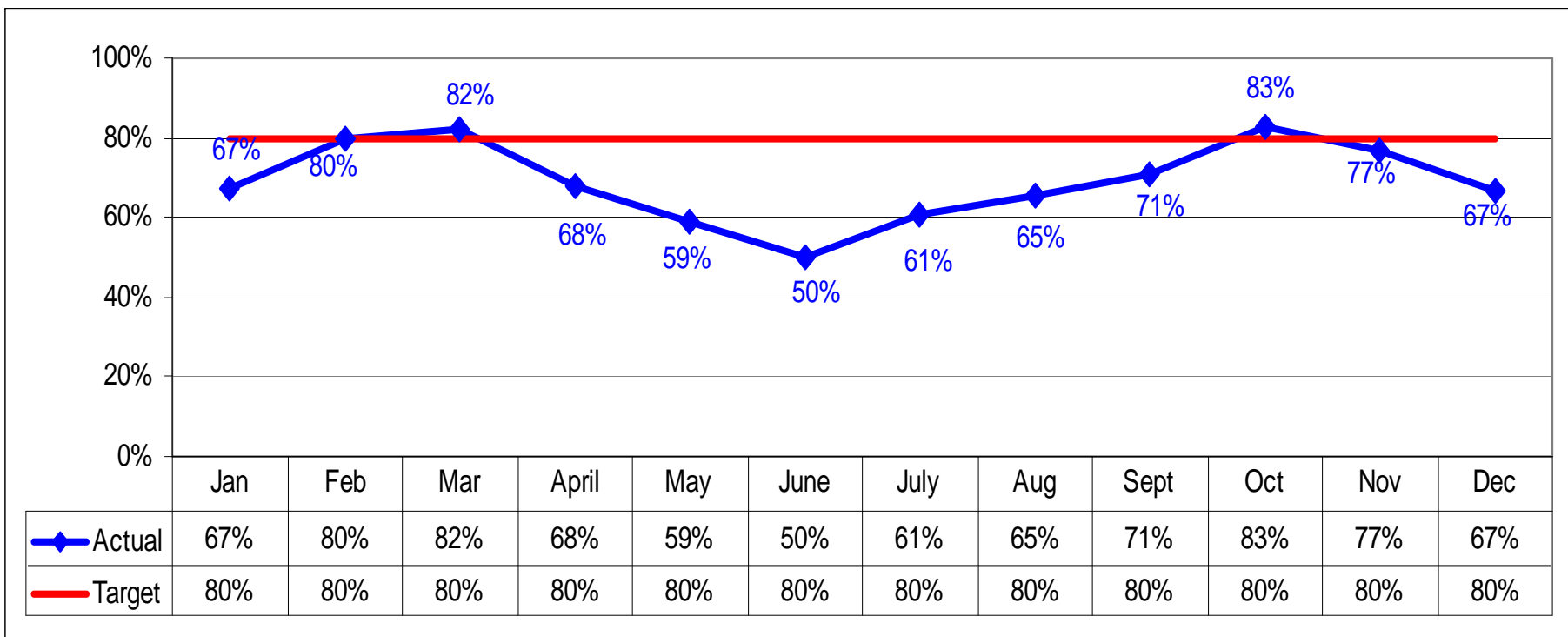
Actual working days = 828 – (50+150+70) = 558 working man day

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5- Calculate the overall resource utilization

$$\text{Resource Utilization} = \frac{\text{Working Days}}{\text{Available Days}} = \frac{558}{828} = 67\%$$

The target is to be > 80%



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This concept can be implemented to different types of resources for multiple projects.

A lot of key indicators can be developed to ensure that management has the right information at the right time and this is vital to make corrective actions, if needed.

## **•End of objective No. 1-**

**To help establish effective and simplified approach/model for overall projects key indicators**



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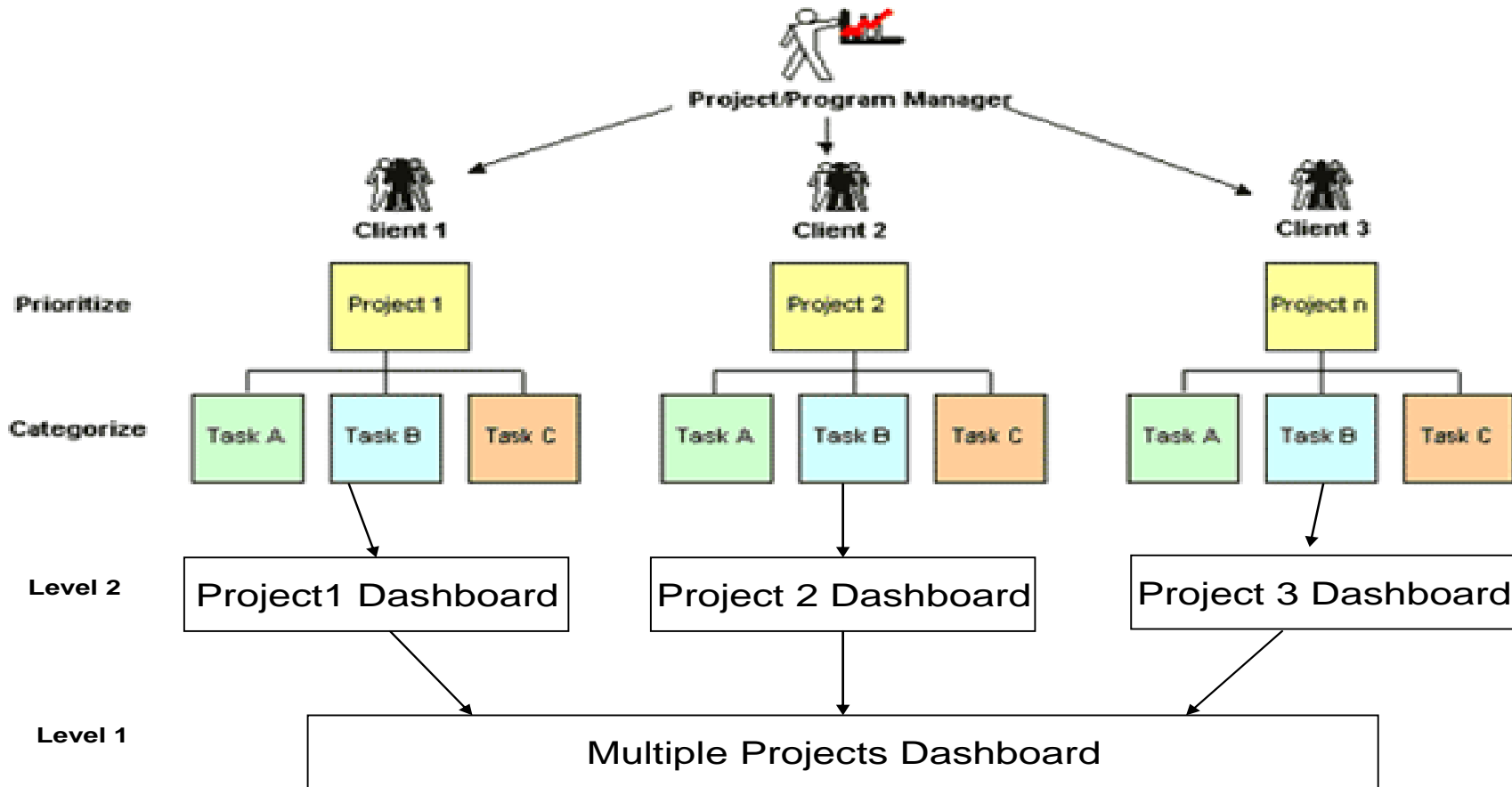
## 2- Establish effective and simplified approach/model for multiple projects data collection

- Managing multiple projects can be successful if managed correctly.

Today's emerging solution is the project

**"Dashboard".**

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Typical recommended system for multiple projects Dashboard system

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The following are major steps of creating successful multiple projects management system:

## Step 1: Create a dashboard for each Project or Order or Task

- All project information will be updated showing the data related.
- No communication will take place between parties except for undefined information posted or omitted from project without the necessary approval from the authorized person.
- This dashboard has to be posted on company server for data integration purposes and to ensure the availability of all data to all Stakeholder's online for crystal clear communication and further decision making, *if necessary*.

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Level 2		Projects / Orders Dashboard Level							Exchange Rate		Report 1	
Project No. _____		Project: _____		As Sold Date: _____		Start Date: _____		Report Date: _____		1		
Project Div. _____		Duration _____		months		Due Date: _____		Time Extension _____		0 months		
PM: _____		Expected Finish Date: _____		Revenues This Period _____		Accum. Revenues _____		% Progress _____		Work In progress _____		
<b>Revenues</b>		Contract Value	Approved Vos.	Revised Value	Revenues Up To	% up to	Revenues This Period	Accum. Revenues	% Progress	Work In progress	Backlog	
Currency												
\$												
EURO												
STR.												
<b>Budget / Cost</b>		<b>Production Costs</b>										
Budget/ Costs	As Sold Production Budget	Adjustments Done By PM	Revised Production Budget	Actual Cost Up To	% Consumed	Actual Costs This Month	Actual Costs	Total % Consumed	Accrual Costs	Variance Than Budget	Requi Additic Costs B	
Materials												
Manpower												
Subcontractor												
Others (details)												
Total Production Costs												
<b>G. Margin/EBIT</b>		As Sold				Forecast				Actual		
Currency	Gross Margin	%Gross Margin	EBIT	% EBIT	Gross Margin	%Gross Margin	EBIT	% EBIT	%Gross Margin	% EBIT		
\$												
EURO												
STR.												
<b>Manhrs / Days</b>		As Sold				Actual						
Required Staff	Budget \$	Revised Budget Hours	Unit Rate	Revised Manhours costs	Man Hrs Variance Than Budget \$	Actual Hours Up To	% Consumed	Actual Hrs This Month	Total Hours Actual	Total % Consumed	Reami Hrs. Comp	
Total												
<b>Budget / Cost Others</b>					<b>Cost Control Analysis</b>							
Budget/ Costs	As Sold Production Budget	Actual Cost Up To	Variance Than Budget Others	% Consumed	Earned Value (BCWP)	Actual Costs (ACWP)	Cost Variance (CV)	Cost Performa Index (C				
Warrant/ Risk												
Sales & Admin												
Sales Taxes												
Other Costs												

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## Step 2: Create a linked dashboard for multiple projects

- This dashboard can be raised to a higher level for better communication and follow up by linking any other projects data dashboard (assume level 2) to a sum of one up linked dashboard (assume level 1).
- Any change in the data related to a project dashboard (level 2) will be reflected immediately on the main dashboard (level 1) showing last project transactions and its side effect on the **Overall multiple** projects operation and on the **Overall company** results.

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## Step 2: Create a linked dashboard for multiple projects

The main benefit gained from implementing such a system is that a:

- 1- Minimum lines of communication will take place.
- 2- Better Time management for better performance and productivity
- 3- Online data availability for immediate corrective action and lessons learned.
- 4- Overall picture for multiple projects online for a better view for a proper decision making and follow up

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## **•End of objective No.2:**

- *To help establish effective and simplified approach/model for multiple projects data collection***

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**3- Develop benchmarking curves depicting areas of effectiveness leading to improving efficiency accurate forecasts and relevant decisions.**

**One simplified system for managing multiple projects:**

Next figure shows the hierarchal structure for cost management of managing multiple projects.

Tools used:

**1-Suitable work package breakdown level**

**2-Bill of Quantity (BOQ)**

**3-A revenue, cost and cash flow benchmark**

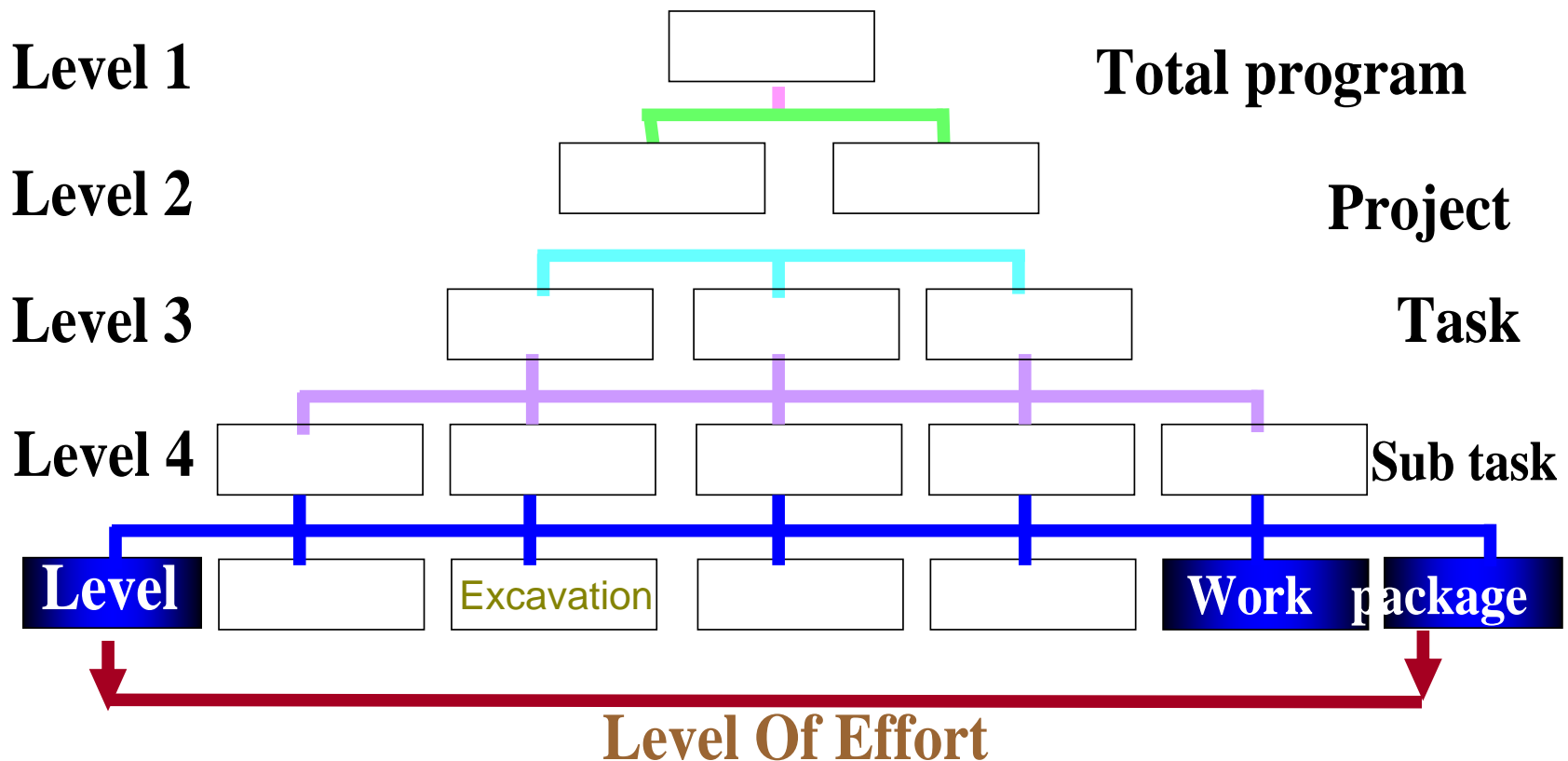
**4-Integration with financial Management system**

**5-The work process**



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## 1- Suitable work package breakdown level



- We have to choose a suitable work package level in which all measurements will be performed against.
- This work package (considered as cost codes) has to include the financial department cost of account (chart of accounts)

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## 2- Bill of Quantity (BOQ):

- The bill of quantity is what the project receives as working items to be performed under contract signature and it commonly received through spreadsheets format.

## 3- The Cost management template:

- Many small to medium size organizations are relying on spreadsheets templates to show sound cost management system that is easy to understand.
- It provides the required flexibility without having to invest in building complicated system.
- **Cost professionals know that excel templates unmatched in flexibility when it come to cost management.**

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- The cost management template introduced in this paper is a three-tier hierarchical system starting at the bottom level with the detailed BOQ and ending with the consolidated summary interface.
- The template is based on model successfully implemented in a medium size organization.
- Similar to Primavera, the proposed template use coloring scheme to enhance the visibility of viewing various activities

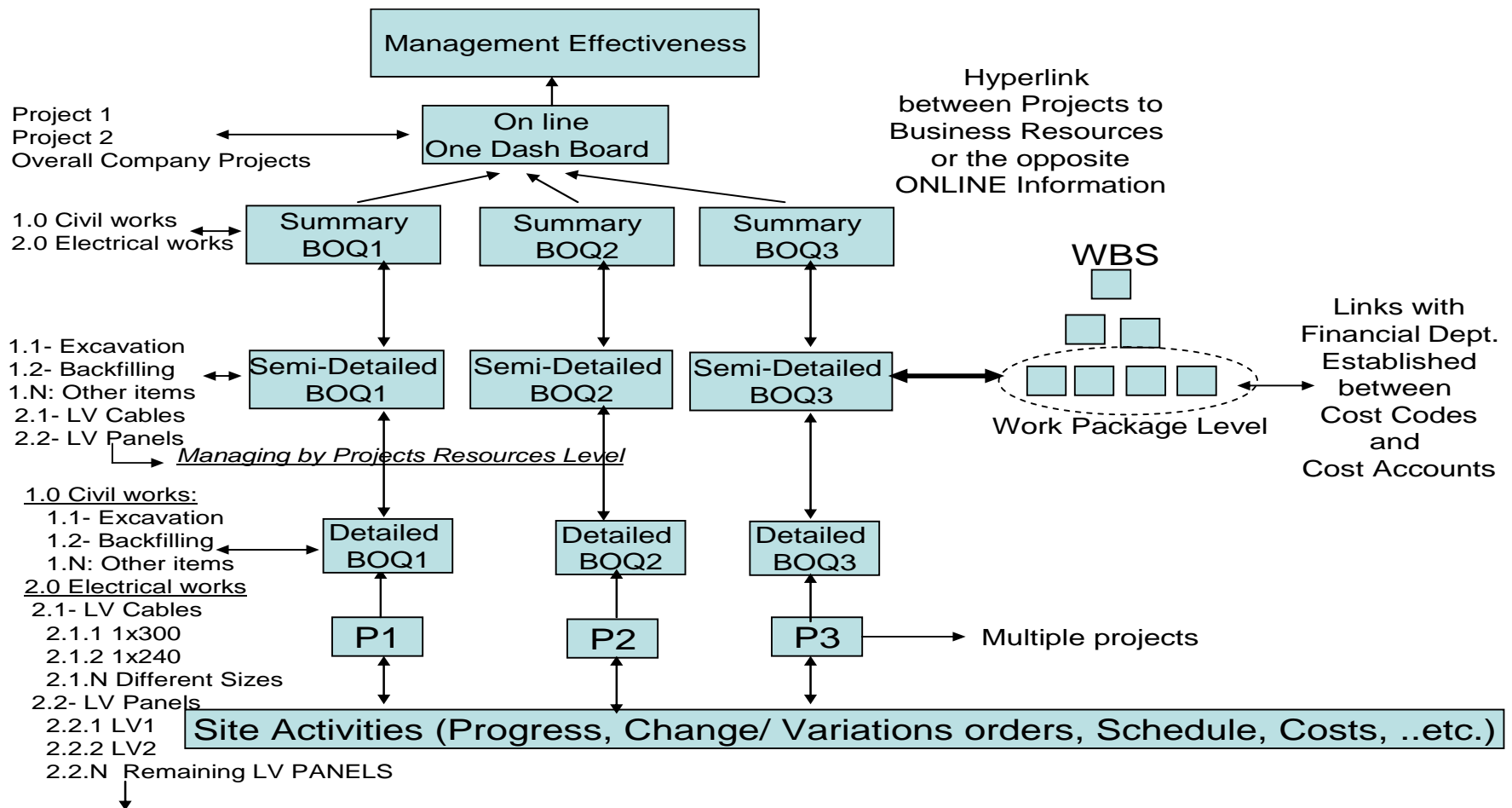
## 4- Integration with the financial management system

- The template is linked with the financial management system using the cost codes.
- A template is developed as platform for exchanging information with the financial applications.

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• 5-The work process:

• Step 1: The data input process:



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## •Step 2:

- The template consolidates the BOQ data to provide summary totals for sales, direct material, equipment, bulks, and labor.

## Step 3: Moving from the detailed to the semi-detailed level;

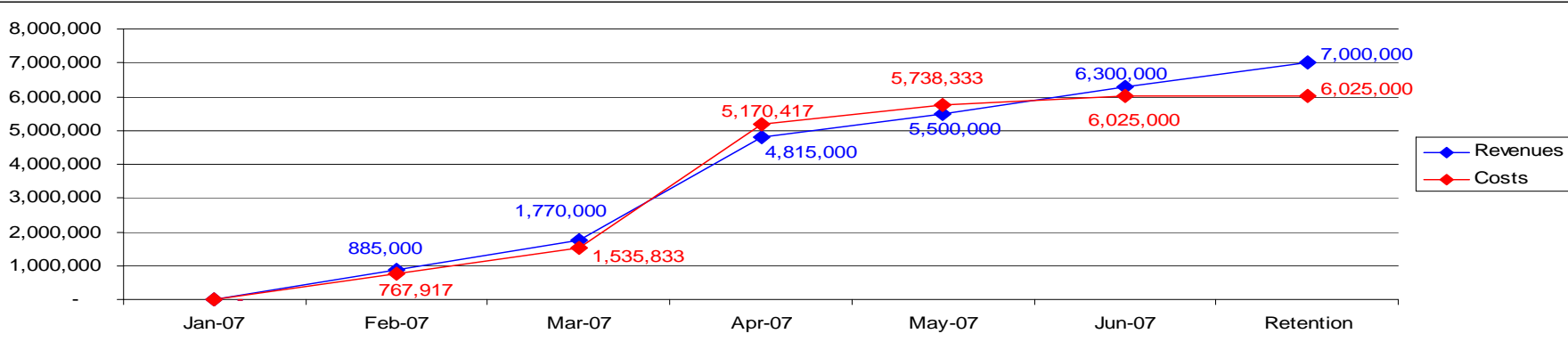
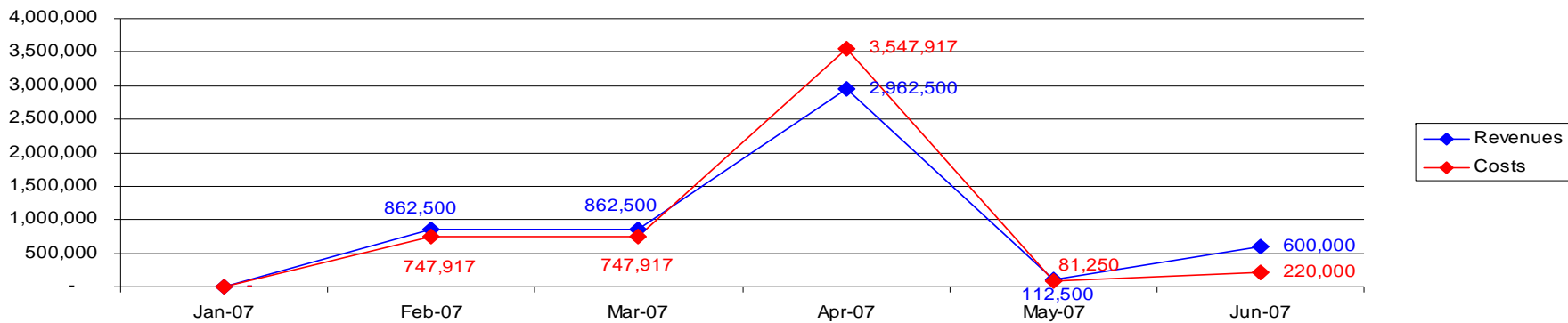
- The consolidated cells for main classification items in the detailed sheets are linked to the semi-detailed sheet.
- The result in creating a semi-detailed BOQ with nearly from 10 to 40 work items for the whole project representing the main classifications previously mentioned.
- The main advantage of the above technique is that any change in the [quantity](#) or [unit price/budget](#) of the [detailed](#) BOQ is [reflected immediately](#) on the [semi-detailed](#) BOQ.

This leads to numerous changes which would be reflected on the decision to be taken on these multiple projects.

*This concept can be implemented on various contract types such as a mark-up reimbursable, lump sum, or unit rate based contracts.*

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	Contract Value	Materials	Manpower	Consultants	Total Direct Costs	% Progress	Revenues	Costs	Revenues	Costs	Revenues	Costs
Contract Condition												
<b>Project A</b>												
Semi Detailed Task 1												
Semi Detailed Task 2												
Semi Detailed Task 3												
<b>Total Revenues / Costs</b>							-	-				
<b>Project B</b>												
Semi Detailed Task 1												
Semi Detailed Task 2												
Semi Detailed Task 3												
<b>Total Revenues / Costs</b>												



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## Step 4: Cash flow and liquidity forecasts:

- Based on the updating revenues and costs, the template generated the cash flow. Responsible managers and financial analysts should have up-to-date information about the cash flow.
- The cash flow information is **very important** to **finance** department in identifying cash flow gaps to allow an early arrangement for cash.
- Cash flow can be predicted same as revenues and costs technique previously illustrated

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## What did we achieve so far?

\*\* All information should be available [ONLINE](#) to all authorized people without the need to request it.

- All projects have been planned and updated for 20-40 activities per project as a maximum and the template reflects all new updates making it ready for all top management analysis.
- The management interference here is so simple , if they want more revenues in a specific month they will ask the project controls to accelerate one delivery item earlier, the cell will be moved online, a new shape for all curves will take place showing the new situation for all parties (procurement will buy earlier or later and Jobsite has to be prepared for this new action on line as the yellow cell will be moved related to the new required action to increase the revenue in one month or decrease it as per top management decision.)
- A clear vision is available to top management enabling them to plan for the company's better financials status.



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## Step 6: The controlling process

Top management usually asks specific questions such as:

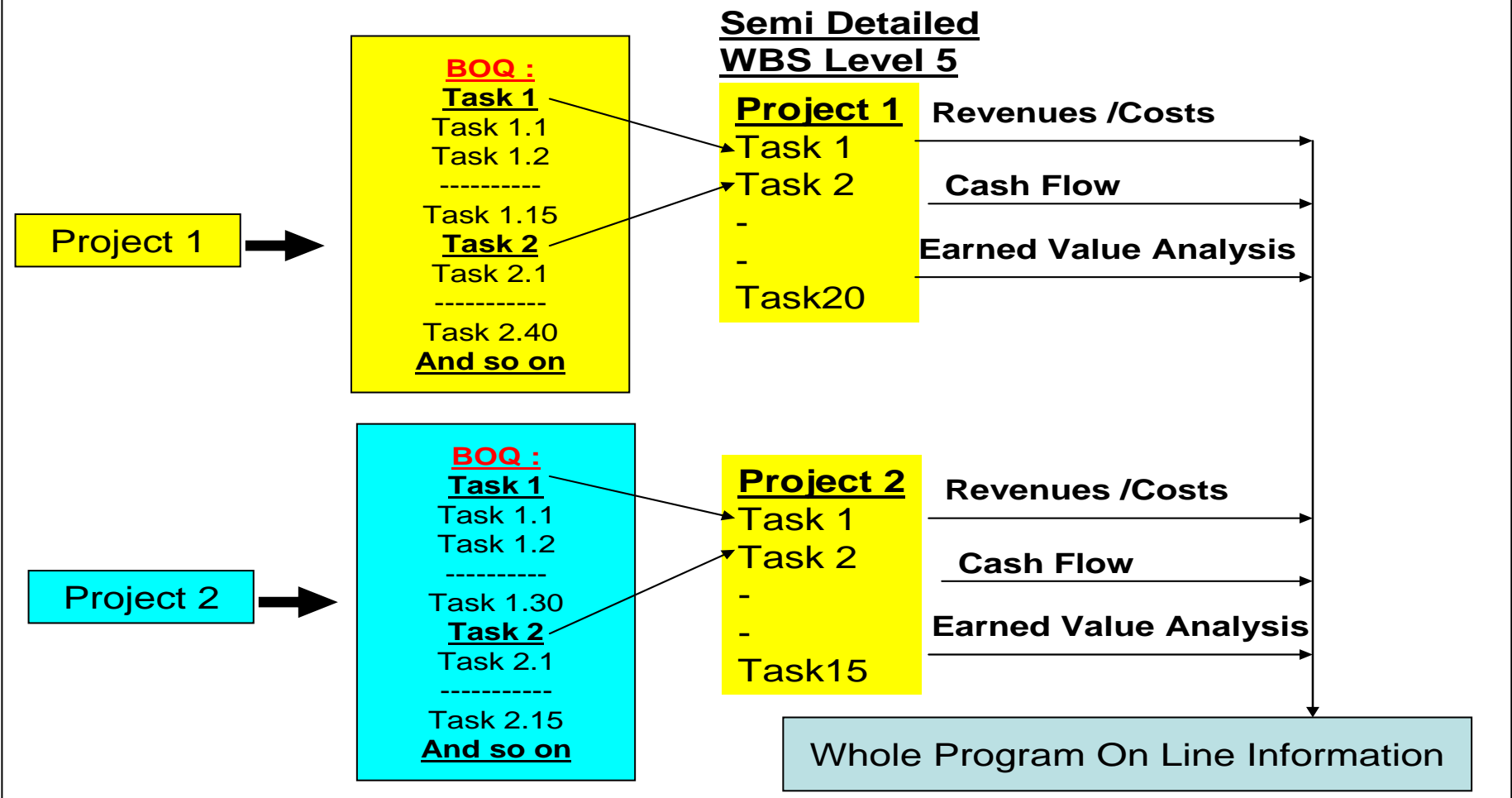
- what is the current status of the project?
- Do we have a hidden profit?
- How can we show it?
- Which projects generate the most or least profits and why?
- Where could be such a chance? Any negative impacts?
- More questions related to monitoring and controlling process.

To answer those questions and concerns, let's continue to work with our model to get the most out of it.

Let us take a look at the following

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## Multiple Projects Information Flow Diagram



## Multiple projects Earned Value analysis

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**Now we can extend the usage of the previous system to calculate the following:**

Cost Variance  $CV = \text{Earned Value } EV - \text{Actual Cost } AC$

Cost Performance Index  $CPI = \text{Earned Value } EV / \text{Actual Cost } AC$

If  $CPI < 1$  It means that we are OVER Budget let us assume a value = 0.89

It means we are getting only 89 cents from each one US\$ spent

By other mean, we till today losing 11% than what has been budgeted

EAC using CPI (typical variances):

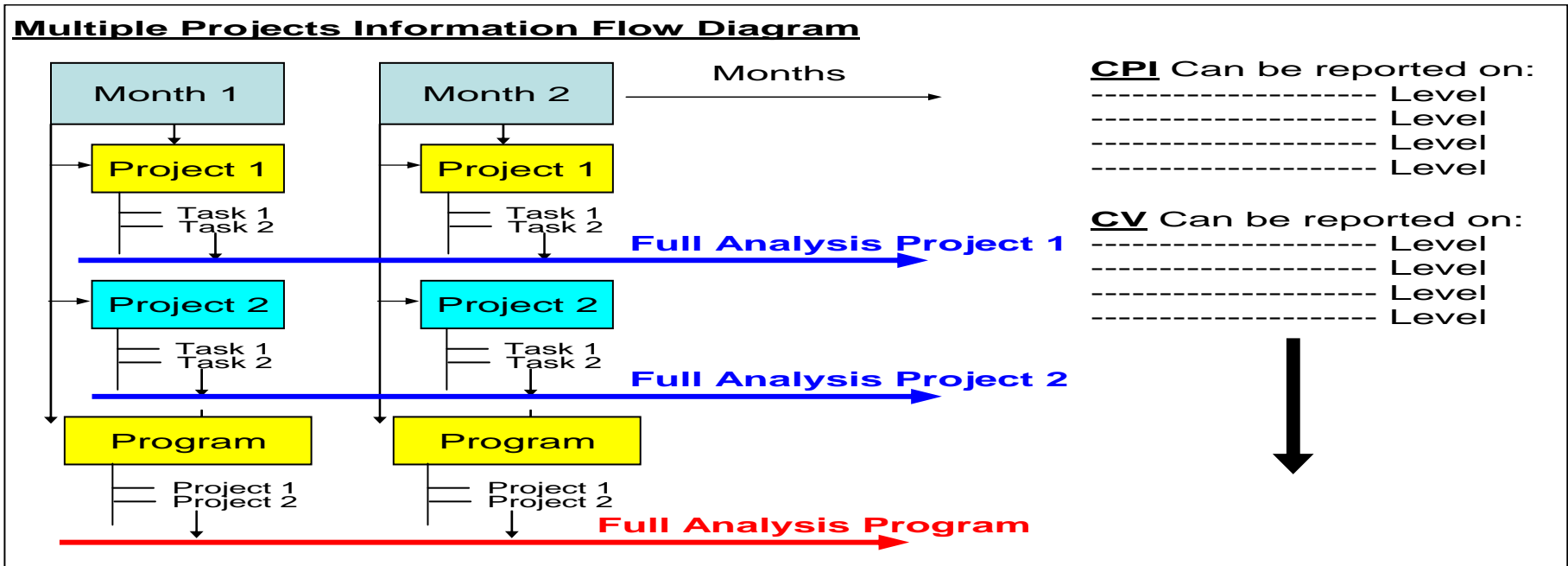
$$EAC = AC + ((BAC - EV) \div CPI)$$

EAC using remaining budget (atypical variances):

$$EAC = AC + BAC - EV$$

EAC = Estimate At Completion and BAC = Budget At Completion

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What we need is the percent of progress for construction which has been approved by client (no need for a direct communication with Jobsite) to request the detailed BOQ as it is reflected immediately on the semi detailed sheet. This resulted in calculating the  $BCWP = \% \text{ progress} \times \text{budget}$  as per work package level.

The financial department uses linked system for relating the construction cost codes to the cost accounts.

A report can be generated showing the actual costs for all work package items.

By having the actual costs, the analysis demonstrated in figure 11 can be achieved

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## Earned Value Analysis

### Month 3:

Contract Condition	Contract Value	Direct Costs			Total Direct Costs	% Progress	BCWP	ACWP	CV	CPI	EAC	VAC
		Materials	Manpower	Consultants								
<b>Project A</b>												
Task 1	100,000	5,000	60,000	15,000	80,000	80%	80,000	56,000	24,000	1.43	56,000	24,000
Task 2	200,000		200,000		200,000	50%	100,000	180,000	(80,000)	0.56	360,000	(160,000)
Task 3	700,000	400,000		200,000	600,000	10%	70,000	70,000	-	1.00	600,000	-
<b>Total Project A</b>	<b>1,000,000</b>				<b>880,000</b>		250,000	306,000	(56,000)	<b>0.82</b>	<b>1,016,000</b>	<b>(136,000)</b>

88%

<b>Project B</b>												
Task	Contract Value	Materials	Manpower	Consultants	Total Direct Costs	% Progress	BCWP	ACWP	CV	CPI	EAC	VAC
Task 1	500,000	25,000	300,000		325,000	10%	50,000	48,000	2,000	1.04	312,000	13,000
Task 2	3,000,000	2,800,000	20,000		2,820,000	5%	150,000	140,000	10,000	1.07	2,632,000	188,000
Task 3	2,500,000		2,000,000		2,000,000	1%	25,000	24,000	1,000	1.04	1,920,000	80,000
<b>Total Project B</b>	<b>6,000,000</b>				<b>5,145,000</b>		225,000	212,000	13,000	<b>1.06</b>	<b>4,847,733</b>	<b>297,267</b>

86%

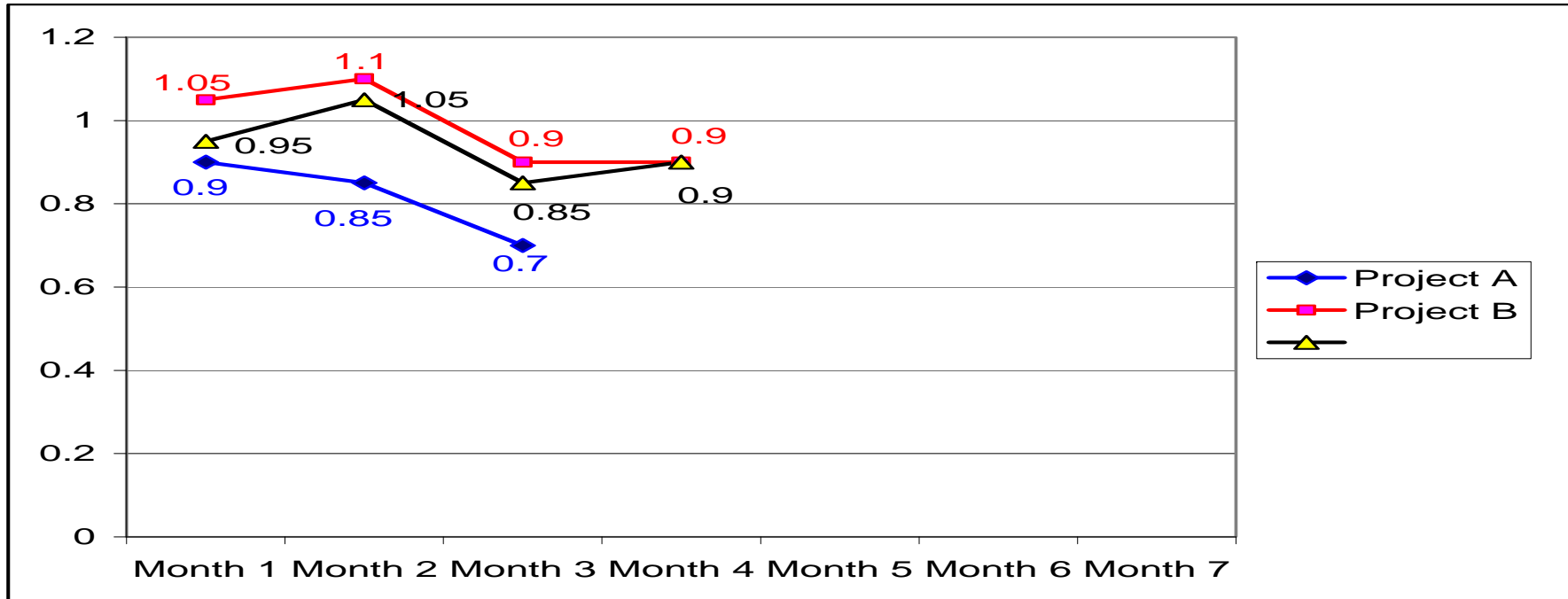
Program	Contract Value	D. Costs	BCWP	ACWP	CV	CPI	EAC	VAC
	7,000,000	6,025,000	475,000	518,000	(43,000)	0.92	5,863,733	161,267

7%

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## Earned Value Analysis Historical Records

CPI	Months						
	1	2	3	4	5	6	7
Project A	0.9	0.85	0.7				
Project B	1.05	1.1	0.9	0.9			
<b>Program</b>	0.95	1.05	0.85			0.9	



## Multiple projects/company overall performance index

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## Conclusion

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## Conclusion:

From all of the above we conclude that implementing the new technique simultaneously of managing multiple projects which is still under development is not an impossible task.

Provided that we could, as much as, possible develop an approach similar to what we have presented here in, noting the following:

- 1- **KPI** – Key Performance Indicators and its importance
- 2- The **Dashboard** concept (Portfolio management)
- 3- The essential of using a **simple integrated system** in managing multiple projects
- 4- Using **WBS** in **matching cost codes** with **cost accounts** for more accurate data and performance measurement



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Also, the net result of the implementation of such new technique in this paper might result in considerable financial advantages:

- Enhance gross margin via a modified value of the costs, including net margin
- Provide feedback to estimating/sales groups.
- Provide a better chance of taking corrective actions through highlighting deviations ONLINE.
- Identify which projects are having problems and needs to pay attention.

*It is to be noted that via the described approaches of dashboards, it would be possible to monitor progress achieved via both operational monitors and corrective actions made.*

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***Thank You !***