

Impact of Revenue Recognition Methods in Projects Cost Control through Earned Value Management (EVM)



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Agenda

- **The earned value theory applied to projects cost control**
- **Revenue recognition as the latest brick in the contract framework building**
- **The meaning of revenue recognition**
- **The revenue recognition process**
- **Revenue recognition methods:**
 - ✓ *Revenue recognized at delivery*
 - ✓ *Revenue recognized before delivering*
 - ✓ *Revenue recognized after delivering*
- **Example of application of the PoC revenue recognition method:**
 - ✓ *Definition of the contractual relationship with subcontractors (third parties)*
 - ✓ *Costs recognition through receipt of purchase orders from subcontractors*
 - ✓ *Costs recognition through assessment of Project Manager*
 - ✓ *Possible conflicts between Operations and Finance Departments*
 - ✓ *Example with figures*
- **Conclusions**

The earned value theory applied to projects cost control (I)

➤ The earned value theory:

- ✓ Introduces an “objective” measure about the status of projects.
- ✓ Introduces measures for deviations in costs and schedule.
- ✓ It permits a quick evaluation of the status of projects with regards to execution timelines, costs and tasks.
- ✓ It is a unique and simple system which integrates multiple evaluations into a unique reporting system.

➤ Schedule Performance Index:

$$SPI = \frac{EV}{PV} = \frac{BCWP}{BCWS}$$

➤ Cost Performance Index:

$$CPI = \frac{EV}{AC} = \frac{BCWP}{ACWP}$$

➤ Being:

- ✓ PV, *Planned Value*; or BCWS, *Budgeted Cost Work Scheduled*.
- ✓ AC, *Actual Costs*; or ACWP, *Actual Costs Work Performed*.
- ✓ EV, *Earned Value*; or BCWP, *Budgeted Cost Work Performed*.

The earned value theory applied to projects cost control (II)

➤ **Cost Performance Index:**

$$CPI = \frac{EV}{AC} = \frac{BCWP}{ACWP}$$

➤ **Being:**

- ✓ EV, *Earned Value*; or BCWP, *Budgeted Cost Work Performed*.
- ✓ AC, *Actual Costs*; or ACWP, *Actual Costs Work Performed*.

Direct fixed costs (estimated):

- Staff
- Trips
- Per diem

Direct variable costs (estimated):

- Estimated project costs

Indirect costs (estimated)

Direct fixed costs (actuals):

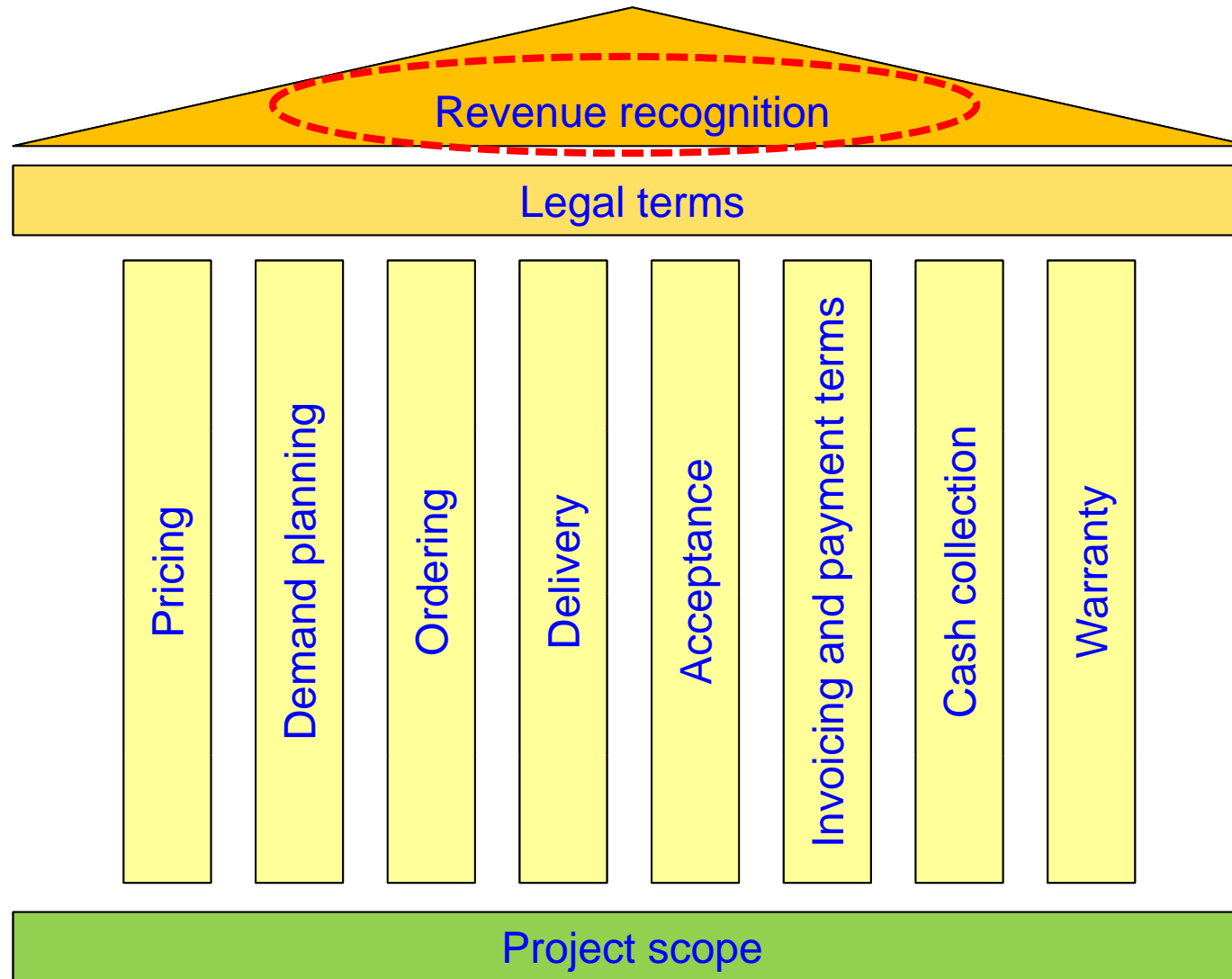
- Staff
- Trips
- Per diem

Direct variable costs (actuals):

- Project "recognized" costs

Indirect costs (actuals)

Revenue recognition as the latest brick in the contract framework building



The meaning of revenue recognition (I)

- **Revenue recognition can be defined in different ways:**
 - ✓ It is the recognition of sales from an accounting point of view.
 - ✓ It is the recognition that the related income has been earned according to the substance of the transaction and according to the customer contract.
 - ✓ Revenue recognition can also be defined as the process of recording an item in the financial statements of the company when earned, regardless when cash is received or paid out (revenue vs. cash timing).
 - ✓ It is a measure of a company's financial position and performance. Company's management, as well as external investors, must be able to rely on it as it is the basis for their economic decision-making.

- **For the recognized revenue to be a reliable measure of the business performance, the uncertainty related to the correctness of the revenue amount and its timing has to be eliminated:**
 - ✓ It is practically eliminated when delivery is a simple box with no future obligations, and payments are made immediately without any refund clauses. A typical example is a supermarket transaction.
 - ✓ The uncertainty is much bigger in other types of business, where delivery, acceptances and payments happen at different times and are subject to more complex contract terms.

The meaning of revenue recognition (II)

- **As an example, some of the uncertainties which could prevent us from recognizing revenue, typically are:**
 - ✓ There is no contractual right to acceptance and payment from the customer.
 - ✓ There is a contractual basis but the prices are not clear and agreed and we may expect to get paid more than the customer is willing to pay us in the end.
 - ✓ There is a contract with clear pricing, but we have not yet delivered accordingly.
 - ✓ There is a contract with clear agreed pricing and we have delivered, but the customer cannot pay us.

- **Revenue recognition allows revenues to be recognized (a) when revenues are realized or realizable and (b) when revenues are earned:**
 - ✓ Revenues are realized when products are exchanged for cash or claims to cash; and revenues are realizable when related assets received are readily convertible to cash or claims to cash.
 - ✓ Revenues are earned when the products are delivered, or when services are performed.

- **Revenue recognition process has become an extremely critical process for companies at the United States stock exchange markets since approval of the Sarbanes-Oxley Act in 2002, as a reaction to several scandals in 2001.**

The basic revenue recognition criteria

- In order to eliminate previous uncertainties, a four basic criteria has to be met in order to recognize revenue.
- According to the United States Generally Accepted Accounting Principles (US GAAP), revenue generally is realized (or realizable) and earned when all of the following criteria are met:
 1. **Persuasive evidence of an arrangement exists:**
 - *Normally, through contracts, purchase orders, ...*
 2. **Delivery has occurred or services have been rendered:**
 - *Criteria to determine if delivery has occurred or services have been rendered will depend on the type of contract or agreement between the parts, i.e., sell of a product, service, construction, leasing, intellectual property, ...*
 3. **The seller's price to the buyer is fixed or determinable:**
 - *There are factors that can lead to variable pricing, such as factors in the customer's control, factors in the seller's control, factors in control of third parties or factors based on external indexes or other underlying.*
 4. **Collectability is reasonably assured:**
 - *If not reasonably assured, revenue must be deferred until collection becomes more certain or it finally occurs.*

The revenue recognition process

0.- IDENTIFY THE ARRANGEMENT:

Arrangement = Result of the complete negotiations between the parties.

1.- IDENTIFY THE DELIVERABLES:

Deliverable = Any performance obligation of the seller (explicit and implied).

2.- IDENTIFY THE ELEMENTS:

Element = Individual deliverables or combinations of deliverables within an arrangement if the functionality of services or products is dependent on each other or do not have value to the customer on a stand alone basis.

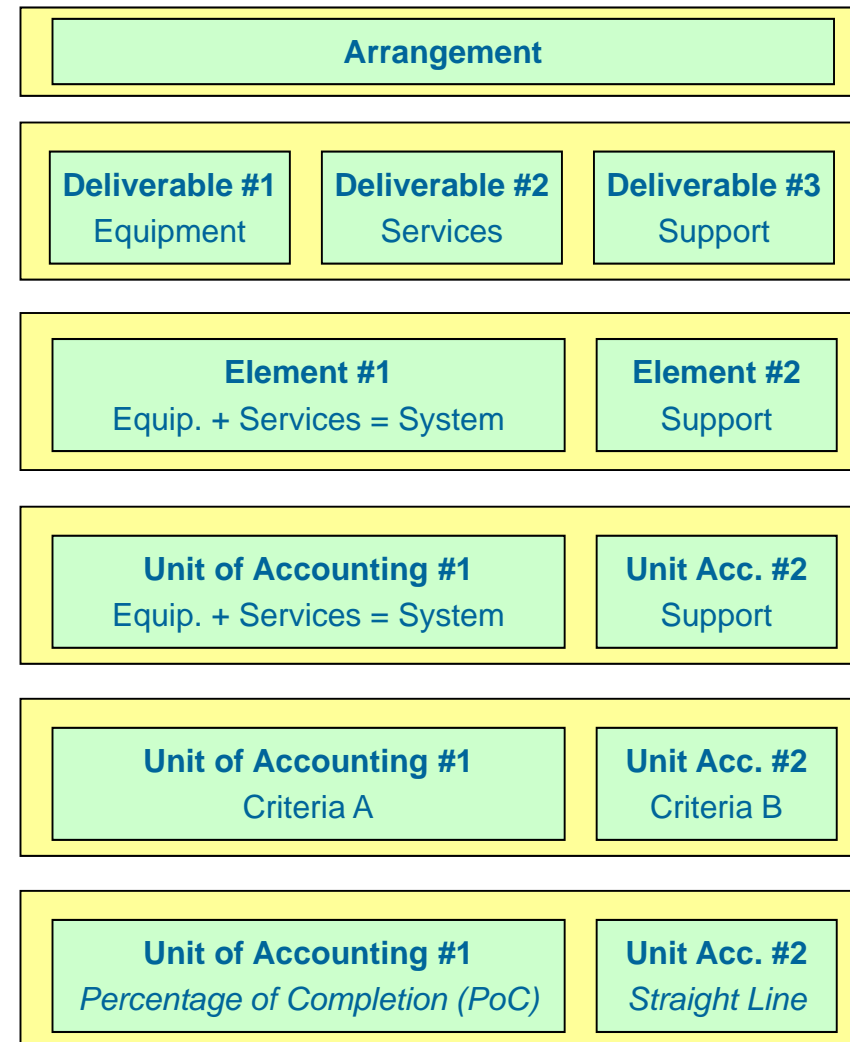
3.- IDENTIFY THE UNITS OF ACCOUNTING:

Unit of accounting = Level at which revenue and costs are recognized.

4.- IDENTIFY APPLICABLE ACCOUNTING GUIDANCE.

5.- REVENUE RECOGNITION CONCLUSION:

Revenue recognition methods are applied to Units of Accounting. The basic revenue recognition criteria must be met before revenue can be taken.



Revenue recognition methods – Revenues recognized at delivery

- As a general rule, revenue from selling inventory should be recognized at the point of sale. Usually, this is understood as the time when inventory is delivered (*ship & bill*).
- This is, for instance, the case of selling equipment, where the seller recognizes the revenue at the moment the equipment leaves the seller's warehouse.
- There are some exceptions where revenues should not be recognized at the point of the sale:
 - ✓ **BUYBACK AGREEMENTS:** Buyback agreement means that a company sells a product and agrees to buy it back after some time. In this situation, the inventory remains on the seller's books. In other words, there is no sale to recognize.
 - ✓ **RETURNS:** Companies which cannot reasonably estimate the amount of future returns, and/or have extremely high rates of returns, should recognize revenues only when the right to return expires. Those companies which can estimate the number of future returns, and have a relatively small return rate, can recognize revenues at the point of sale, but must deduct estimated future returns.

Revenue recognition methods – Revenues recognized at delivery – Impact on EVM

- In general, this revenue recognition method where revenues are recognized at delivery is more related to the selling of products or goods.
- From the application of EVM point of view, if this method is applicable to the project (or to one of the deliverables or elements of the project), the Project Manager will have to consider in the planning phase how the items or products related to the project will be delivered during the executing phase.
- By doing things in this way, it will make sense to compare actual costs (AC) related to the deliverables or elements of the project where this method is applicable, with the earned value (EV) and hence, to calculate CPI.

Revenue recognition methods – Revenues recognized before delivery

- These methods are typically used in long term contracts such as construction projects, manufacturing, development, network deployments, ...
- These contracts must allow the builder (seller) to bill (invoice) the purchaser at various parts of the project:
 - ✓ **PERCENTAGE-OF-COMPLETION (PoC)**: If (1) the contract clearly specifies the price and payment options with transfer of ownership; (2) the buyer is expected to pay the whole amount; and (3) the seller is expected to complete the project; then revenues, costs, and gross profit can be recognized each period based upon the progress of construction (that is, percentage of completion).
 - ✓ **STRAIGHT LINE METHOD**: Under this method, incomes (or revenues), costs and gross profit for a project are linearly distributed over the duration of the project. This method is mainly used in maintenance contracts or customer support projects.
 - ✓ **COMPLETED CONTRACT METHOD**: This method should only be used if percentage-of-completion is not applicable or the contract involves extremely high risks. Under this method, revenues, costs, and gross profit are recognized only after the project is fully completed. Nevertheless, expected losses should be recognized fully and immediately due to conservatism constraint.

Revenue recognition methods – Revenues recognized before delivery – Impact on EVM

- In order to apply EVM with **PoC**, in the planning phase, it will be necessary:
 - ✓ To define the internal milestones that will be used to measure progress.
 - ✓ To do the planning and scheduling of the project in accordance with those milestones.
- In the executing phase, it will be necessary to measure and record the progress of the project against those internal milestones.
- In this way, it will make sense to compare actual costs (AC) calculated through PoC with the earned value (EV) and hence, to calculate CPI.

Revenue recognition methods – Revenues recognized before delivery – Impact on EVM

- In the case of **straight line method**, this method mainly applies to recognition of revenue, which is evenly distributed over the period of time covered by a contract or purchase order.
- With regard to costs recognition in projects where **straight line method** is applied (mainly maintenance or services projects), the Project Manager will just have to estimate the project costs and forecast how those costs will be incurred over the project.
- Doing things in this way, application of EVM is quite simple, provided that costs were properly estimated in the planning phase.
- If that is the case, estimated costs will usually be evenly distributed over the project duration and, as per the matching principle between costs and revenues, they will be recognized in the same way during the executing phase.
- This will lead EV (or the budgeted cost of work performed) to be very close to the actual incurred costs (AC); and hence, will lead CPI to be always close (or equal) to 1.

Revenue recognition methods – Revenues recognized before delivery – Impact on EVM

- In the case of the **completed contract method**, from the EVM point of view, in order to not be blind about the status of the project until the end of the project (after waiting for the actual costs provided by the Finance Department), the Project Manager will need to keep a separate accountability about the incurred costs as the project goes by, before those costs being deferred by the Finance Department.
- By doing it in this way, and having used the same criteria in the planning of those costs, it will make sense to calculate the earned value (EV) and to compare it with the deferred costs in order to have a meaningful CPI value.

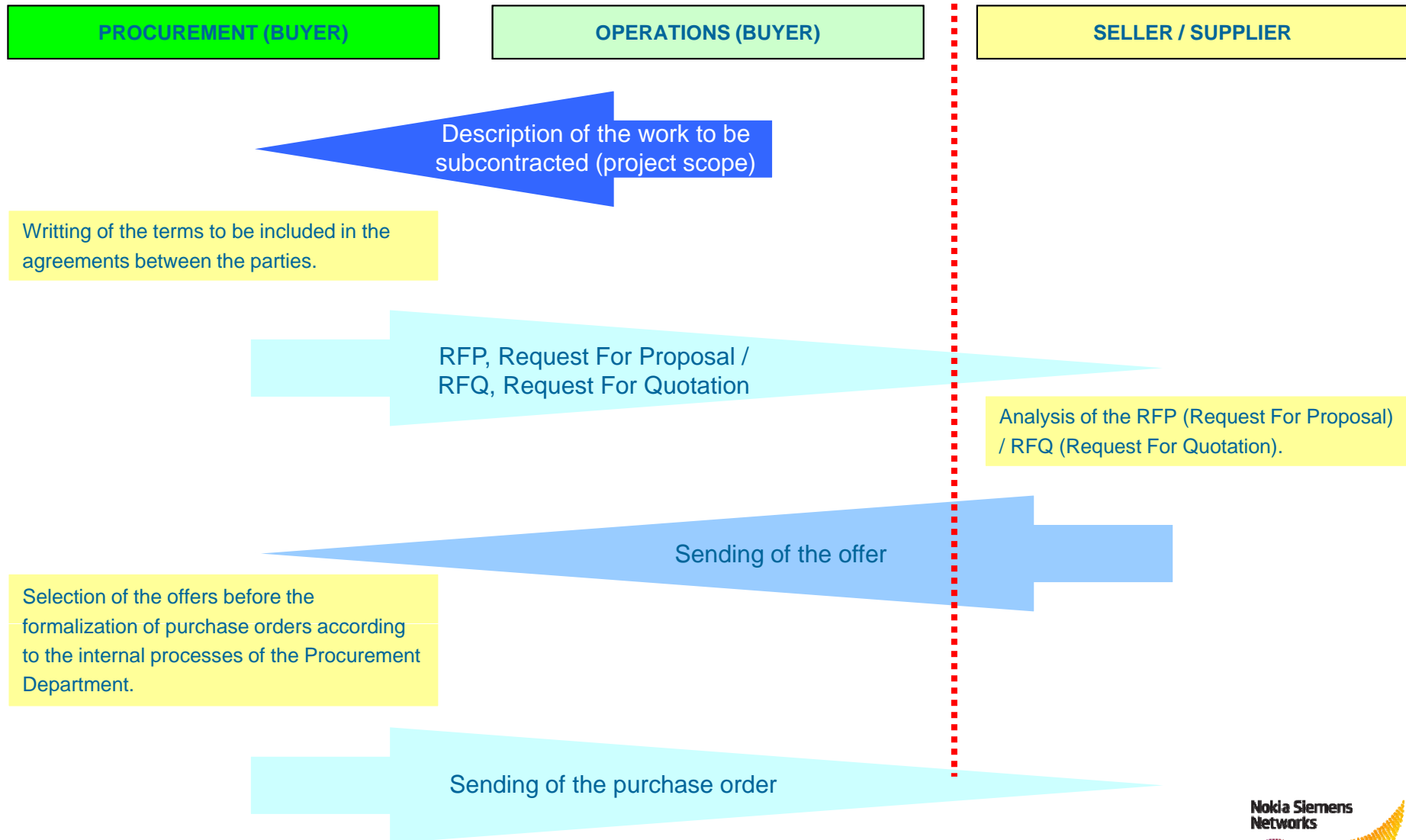
Revenue recognition methods – Revenues recognized after delivery

- In those cases where the collection of receivables involves a high level of risk; or there is a high degree of uncertainty regarding collectability, then a company must defer the recognition of revenue.
- There are three methods which deal with this situation:
 - ✓ **INSTALLMENT SALES METHOD:** This method allows recognizing proportional gross profit on cash collection. For example, if a company collected 45% of total product price, it can recognize 45% of total profit on that product.
 - ✓ **COST RECOVERY METHOD:** This method is used when there is an extremely high probability of uncollectible payments in exchange to the sell of a product or service. Under this method no profit is recognized until cash collections exceed the seller's cost of the merchandise sold.
 - ✓ **DEPOSIT METHOD:** This method is used when the company receives cash before sufficient transfer of ownership occurs. Revenue shall not be recognized because the risks and rewards of ownership have not transferred to the buyer.

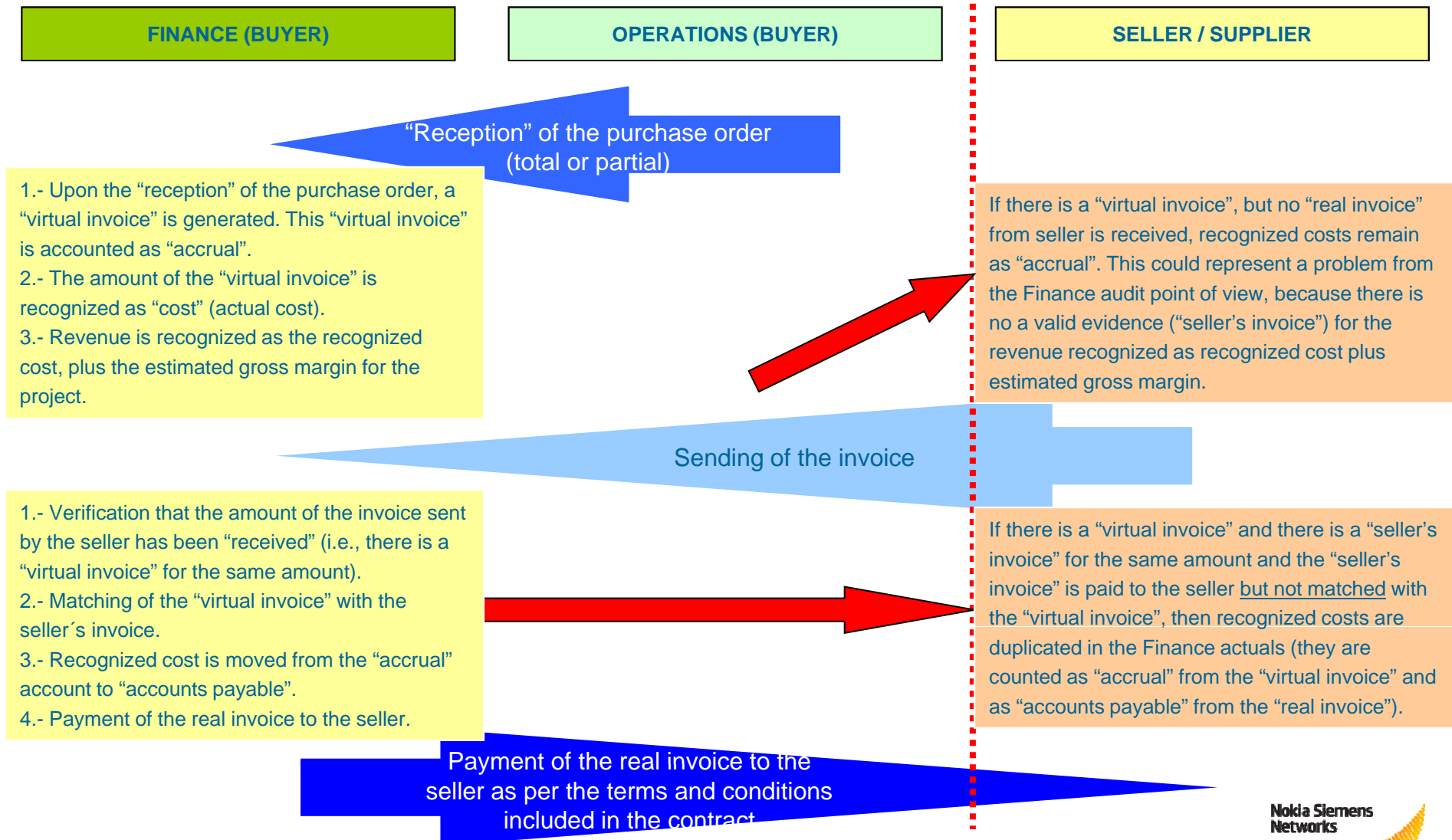
Revenue recognition methods – Revenues recognized after delivery – Impact on EVM

- From the EVM point of view, these methods have the same limitations as the completed contract method.
- That is, information about actual costs provided by the Finance Department could be not useful to track the status of projects because the Finance Department could be deferring (totally or partially) the recognition of incurred costs till the end of the project in order to fulfill the matching principle.
- So, as in the completed contract situation, the Project Manager will have to keep a separate accountability about the incurred costs as the project goes by.
- By doing it in this way, and having used the same criteria in the planning of those costs, it will make sense to calculate the earned value (EV) and to compare it with the deferred costs in order to have a meaningful CPI value.

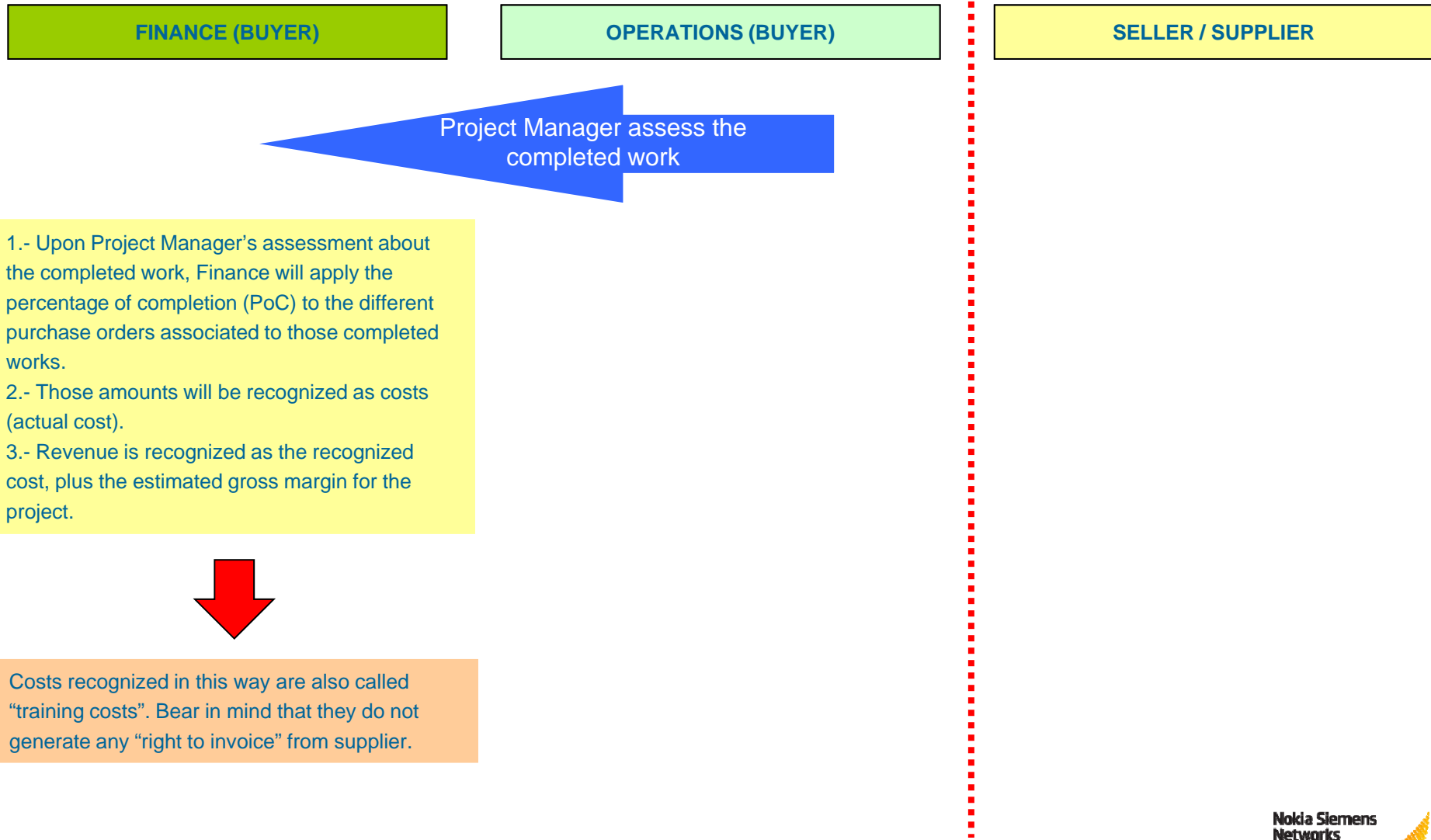
Example of application of the PoC revenue recognition method – Definition of the contractual relationship with subcontractors (third parties)



Example of application of the PoC revenue recognition method – Costs recognition through receipt of purchase orders from subcontractors



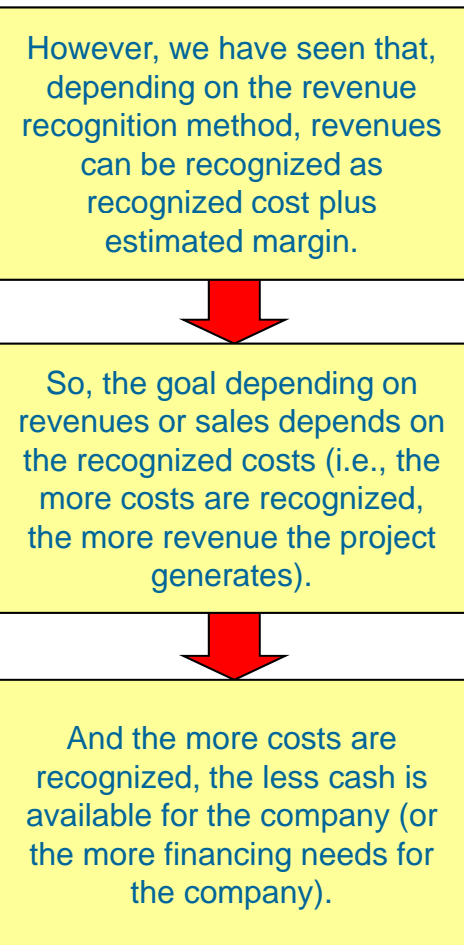
Example of application of the PoC revenue recognition method – **Costs recognition through assessment of Project Manager**



Example of application of the PoC revenue recognition method – Possible conflicts between Operations and Finance Departments

- Goals for the Operations Department:
 - ✓ Typically, defined per project.
 - ✓ Each Project Manager is responsible for the accomplishment of the goals for “his / her” project.
 - ✓ *Examples of goals for the Operations Department:*
 - *Revenues or sales.*
 - *Gross margin.*
 - ...

- Goals for the Finance Department:
 - ✓ Typically, defined for the set of projects within the company.
 - ✓ The Finance Director is responsible for the accomplishment of the financial goals for all the projects within the company.
 - ✓ *Examples of goals for the Finance Department:*
 - *Cash generation.*
 - *Financing needs.*
 - ...



Example of application of the PoC revenue recognition method – Example with figures

➤ Initial project planning:

Monthly figures	BASELINE	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year	
	Cost	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$9,600,000
	Revenue														\$12,000,000
	Margin														\$2,400,000
	Margin (%)														20.00%

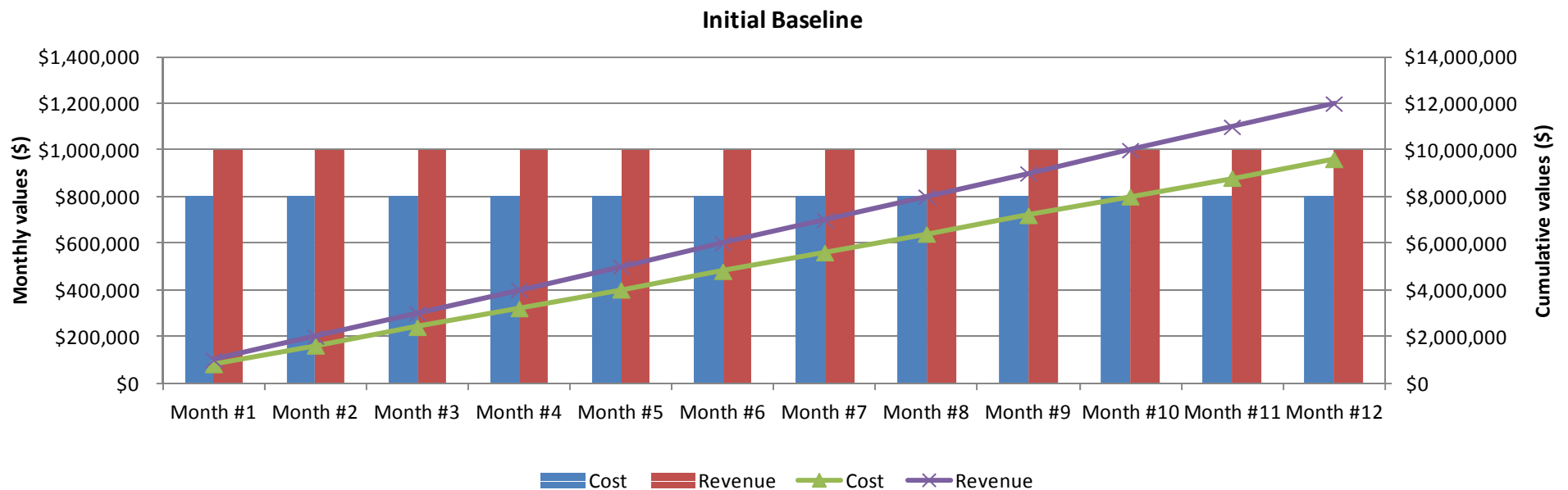


Monthly figures	BASELINE	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year	
	Cost	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$9,600,000
	Revenue	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$12,000,000
	Margin	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$2,400,000
Margin (%)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	

Cumulative figures	BASELINE	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	
	Cost	\$800,000	\$1,600,000	\$2,400,000	\$3,200,000	\$4,000,000	\$4,800,000	\$5,600,000	\$6,400,000	\$7,200,000	\$8,000,000	\$8,800,000	\$9,600,000	
	Revenue	\$1,000,000	\$2,000,000	\$3,000,000	\$4,000,000	\$5,000,000	\$6,000,000	\$7,000,000	\$8,000,000	\$9,000,000	\$10,000,000	\$11,000,000	\$12,000,000	
	Margin	\$200,000	\$400,000	\$600,000	\$800,000	\$1,000,000	\$1,200,000	\$1,400,000	\$1,600,000	\$1,800,000	\$2,000,000	\$2,200,000	\$2,400,000	
Margin (%)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%		

Example of application of the PoC revenue recognition method – Example with figures

➤ Initial project planning:



Example of application of the PoC revenue recognition method – Example with figures

- Actual values by mid project:

Monthly figures	ACTUALS	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year
	Cost		\$925,000	\$975,000	\$955,000	\$945,000	\$935,000	\$965,000						
Revenue														
Margin														
Margin (%)														

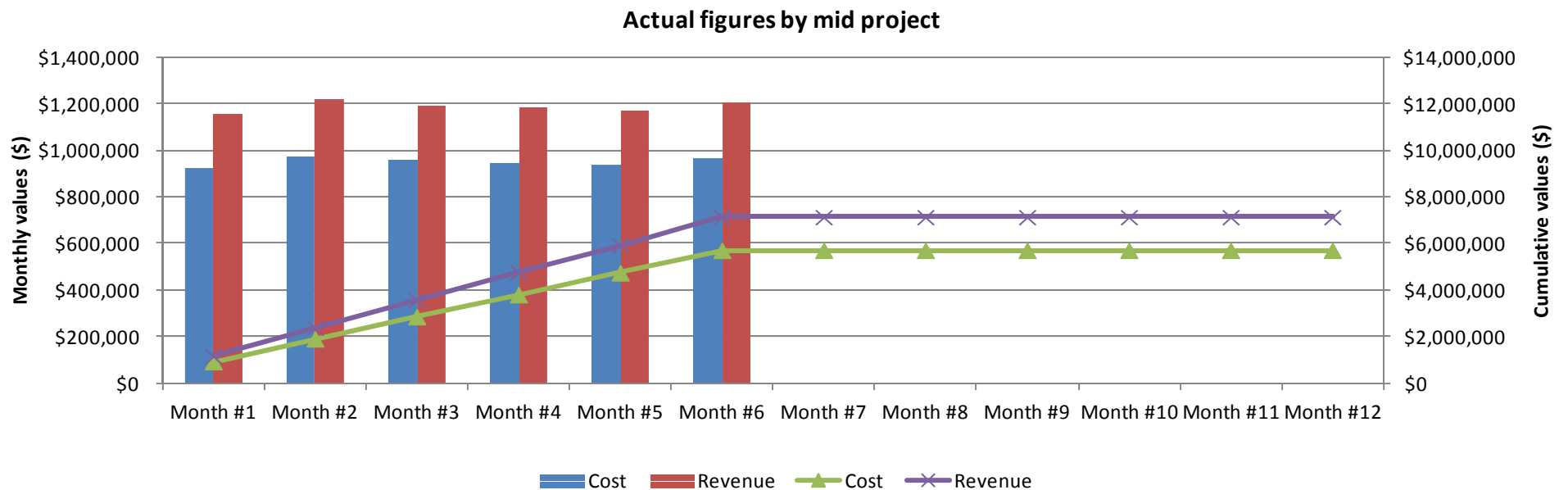


Monthly figures	ACTUALS	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year
	Cost		\$925,000	\$975,000	\$955,000	\$945,000	\$935,000	\$965,000						
Revenue		\$1,156,250	\$1,218,750	\$1,193,750	\$1,181,250	\$1,168,750	\$1,206,250	\$0	\$0	\$0	\$0	\$0	\$0	\$7,125,000
Margin		\$231,250	\$243,750	\$238,750	\$236,250	\$233,750	\$241,250	\$0	\$0	\$0	\$0	\$0	\$0	\$1,425,000
Margin (%)		20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%

Cumulative figures	BASELINE	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	
	Cost		\$925,000	\$1,900,000	\$2,855,000	\$3,800,000	\$4,735,000	\$5,700,000	\$5,700,000	\$5,700,000	\$5,700,000	\$5,700,000	\$5,700,000	\$5,700,000
Revenue		\$1,156,250	\$2,375,000	\$3,568,750	\$4,750,000	\$5,918,750	\$7,125,000	\$7,125,000	\$7,125,000	\$7,125,000	\$7,125,000	\$7,125,000	\$7,125,000	
Margin		\$231,250	\$475,000	\$713,750	\$950,000	\$1,183,750	\$1,425,000	\$1,425,000	\$1,425,000	\$1,425,000	\$1,425,000	\$1,425,000	\$1,425,000	
Margin (%)		20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	

Example of application of the PoC revenue recognition method – Example with figures

➤ Actual values by mid project:



Example of application of the PoC revenue recognition method – Example with figures

- Project replan considering actual values up to mid of the project and new estimations (based on actuals) from mid project onwards:

Monthly figures	ACTUALS	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year	
	Cost	\$925,000	\$975,000	\$955,000	\$945,000	\$935,000	\$965,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$11,400,000
	Revenue	\$1,156,250	\$1,218,750	\$1,193,750	\$1,181,250	\$1,168,750	\$1,206,250								
	Revenue Adj.														
	Revenue (after adj.)	\$1,156,250	\$1,218,750	\$1,193,750	\$1,181,250	\$1,168,750	\$1,206,250								\$12,000,000
	Margin	\$231,250	\$243,750	\$238,750	\$236,250	\$233,750	\$241,250								\$600,000
Margin (%)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%							5.00%	



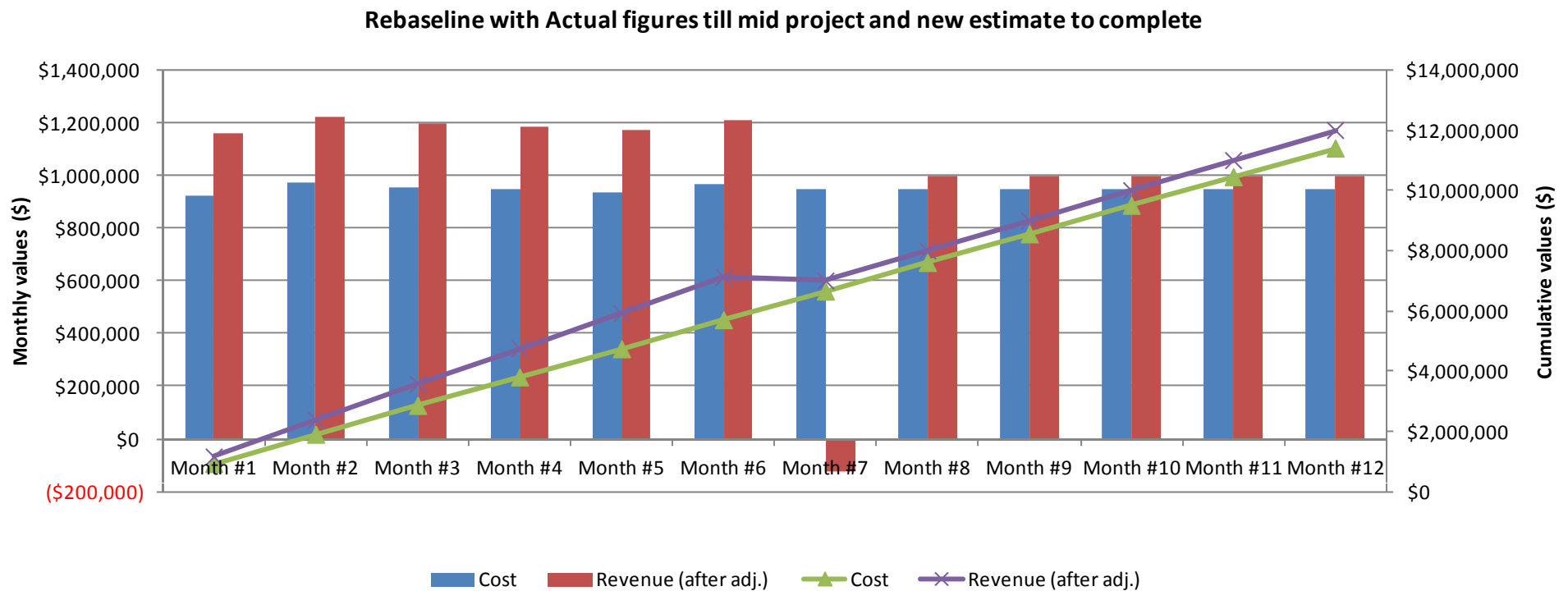
Monthly figures	ACTUALS	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12	TOTAL Year	
	Cost	\$925,000	\$975,000	\$955,000	\$945,000	\$935,000	\$965,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$950,000	\$11,400,000
	Revenue	\$1,156,250	\$1,218,750	\$1,193,750	\$1,181,250	\$1,168,750	\$1,206,250	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$13,125,000
	Revenue Adj.							(\$1,125,000)							(\$1,125,000)
	Revenue (after adj.)	\$1,156,250	\$1,218,750	\$1,193,750	\$1,181,250	\$1,168,750	\$1,206,250	(\$125,000)	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$12,000,000
	Margin	\$231,250	\$243,750	\$238,750	\$236,250	\$233,750	\$241,250	(\$1,075,000)	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$600,000
Margin (%)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	860.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	

Cumulative figures	BASELINE	Month #1	Month #2	Month #3	Month #4	Month #5	Month #6	Month #7	Month #8	Month #9	Month #10	Month #11	Month #12		
	Cost	\$925,000	\$1,900,000	\$2,855,000	\$3,800,000	\$4,735,000	\$5,700,000	\$6,650,000	\$7,600,000	\$8,550,000	\$9,500,000	\$10,450,000	\$11,400,000	\$11,400,000	
	Revenue	\$1,156,250	\$2,375,000	\$3,568,750	\$4,750,000	\$5,918,750	\$7,125,000	\$8,125,000	\$9,125,000	\$10,125,000	\$11,125,000	\$12,125,000	\$13,125,000	\$13,125,000	
	Revenue Adj.	\$0	\$0	\$0	\$0	\$0	\$0	(\$1,125,000)	(\$1,125,000)	(\$1,125,000)	(\$1,125,000)	(\$1,125,000)	(\$1,125,000)	(\$1,125,000)	
	Revenue (after adj.)	\$1,156,250	\$2,375,000	\$3,568,750	\$4,750,000	\$5,918,750	\$7,125,000	\$7,000,000	\$8,000,000	\$9,000,000	\$10,000,000	\$11,000,000	\$12,000,000	\$12,000,000	
	Margin	\$231,250	\$475,000	\$713,750	\$950,000	\$1,183,750	\$1,425,000	\$350,000	\$400,000	\$450,000	\$500,000	\$550,000	\$600,000	\$600,000	
Margin (%)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%		



Example of application of the PoC revenue recognition method – **Example with figures**

- Project replan considering actual values up to mid of the project and new estimations (based on actuals) from mid project onwards:



Conclusions

- If the Project Manager is going to use the data provided by the Finance Department about project costs, he / she must take into account that those costs are “recognized” costs.
- In the same way, as long as the Project Manager is responsible for the achievement of the sales goals of the project, he / she must take into account that sales (revenues) are “recognized” sales (revenues), different from “invoiced” sales and different from collected sales.
- During the planning of project costs (planning phase), the Project Manager should know (and take into account) the method that will be used to recognize those project costs during the executing phase.
- A given project (based on a contract) could include different elements (deliverables) associated to different ways to recognize costs and revenues.
- During the executing phase, the Project Manager should be ready to cope with possible conflicts between the project goals (Operations) and the Finance goals.

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