Project Management

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Week: 4

Lecture 17 : Estimating Project Budgets

Dear students, in this lecture we are going to discuss about very important topics, which are very important topic that is project costing, otherwise estimating project budget. Because for implementing a project the budget is very important element, you should know how to prepare a budget and what are the consideration while preparing the budget. So, in the last class I discussed about project feasibility analysis, now I am going to cover estimating project budget. So, the agenda for this lecture is I am going to discuss about importance of project cost management and estimating the project budget and there are two way for collecting information for making the project, one is top down budgeting, other one is bottom up budgeting. Then some of the issues with bottom up budgeting, later we will study about work element cost, then we should go for iterative budgeting process, finally how to do a budgeting for running a agile project management, these are the agenda for today's lecture. First we will discuss about importance of project cost management, as a project manager the first priority is obtaining resources with which to do the work.

Agenda

- Importance of project cost management
- Budget and its Importance
- Estimating Project Budgets
- Top-Down Budgeting
- Bottom-Up Budgeting
  - a reserve analysis
- Bottom-up process as risky
- Work Element Costing
- **Iterative Budgeting Process**
- Budgeting with Agile

Importance of project cost management

- First priority is obtaining resources with which to do the work.
- Here, the project manager (PM) needs to work with the project owner and the project sponsor to develop a budget that will be acceptable to the funder and/or the project steering committee representing senior management.

Here the project manager needs to work with a project owner and the project sponsor to develop a budget that will be acceptable to the funder and the project steering committee representing the senior management. That is why making a appropriate project is more important because that should be accepted by sponsors and the top management. What is the budget? We have studied in the previous lectures what is work breakdown structure, for each breakdown structure if you each work element if you add some cost then it will become your project budget. So, there is a close connection between your work breakdown structure and the project budget.

What is budget?

- A budget is a plan for allocating resources.
- The budget is a reflection of the WBS in another form.
- Act of budgeting is the allocation of scarce resources to the various endeavors of an organization.
- The outcomes of the allocation process often do not satisfy managers

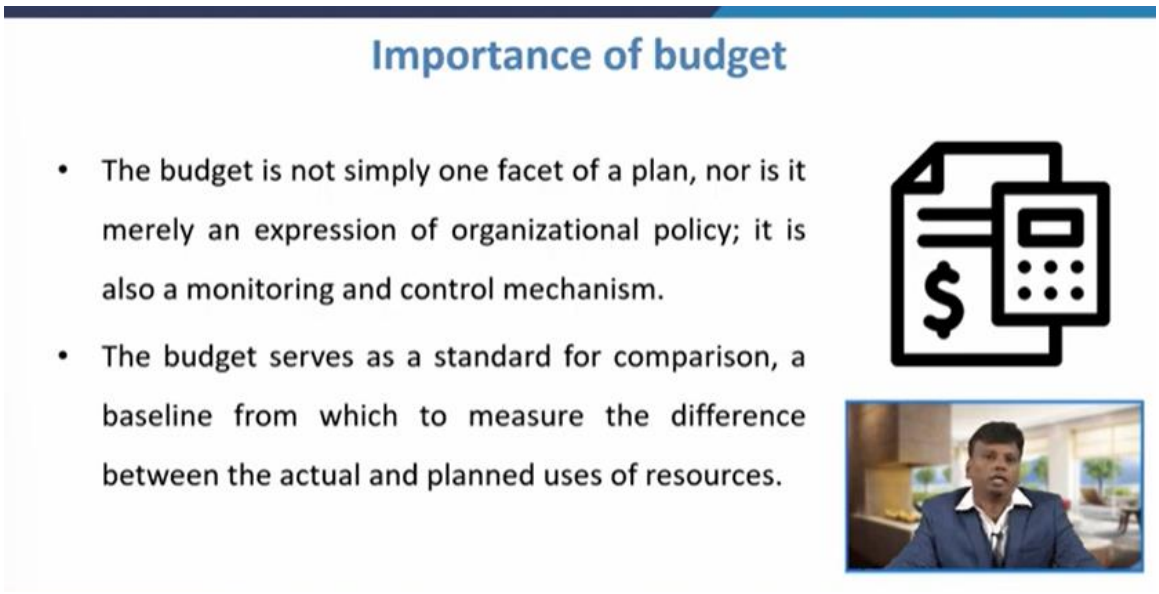
So, your budget is a plan for allocating resources, so the budget is a reflection of your work breakdown structure in another form nothing but we added money into that. So, act of budgeting is the allocation of scarce resources to the various endeavors of an organization. So, the outcome of the allocation process often do not satisfy the managers in the sense when you allocate budgets to various projects or element of the project many time that receiving side they may not be happy with that budget always they will expect to get more money more allocation for their project. Now your project should not be under budgeted or over budgeted, so how to know the right level of budget. So, the degree to which the different activities of your organizations are fully supported by an allocation of resources is one measure of the importance placed on outcome of the activity.

Right level of budget

- The degree to which the different activities of an organization are fully supported by an allocation of resources is one measure of the importance placed on the outcome of the activity.
- Most of the senior managers try hard to be unbiased in the budgetary process, funding each planned activity at the "right" level
- Overfunding produces waste and encourages slack management,
- Underfunding inhibits accomplishment and frustrates the committed.

In the sense some group of people may accept your budget in the same organization

some group may not accept the project. So most of the senior manager try hard to be unbiased in the budgetary process funding each planned activity at the right level. So sometime there is a possibility over funding, so allocating more resources than what is required. So over funding produces waste and encourages slack management but there may be a chance for under funding. So when you go do the under funding that is you allocate less than what is required, so that will inhibit accomplishment and frustrates the people who are involved in the project.



So the budget is not simply one factor of your plan nor is it merely an expression of organization policy it is also a monitoring and control mechanism. So one way to control or monitor the project is having full control on the budget. So budget serve as a standard for comparison, a baseline from which to measure the difference between the actual and the planned uses of resources. Later classes we will study about earned value analysis. When we measure the performance of the project there is a concept called earned value analysis there will explain that this concept in detail.

Importance of budget

- As the manager directs the deployment of resources to accomplish some desired objective, resource usage should be monitored carefully.
- This allows deviations from planned usage to be checked against the progress of the project, and exception reports can be generated if resource expenditures are not consistent with accomplishments.

So here the budget is a way to control the project and to measure how much work is done for the project. As the manager direct the deployment of resources to accomplish some desired objectives, resources usage should be monitored carefully. So this allows deviations from planned usage to be checked against the progress of the project and the exception reports can be generated if the resource expenditures are not consistent with accomplishment. So we assume that there is a direct correlation between resource usage and the progress of the project. If there is a mismatch that has to be informed to the project owners.

Importance of budget

- Indeed, the pattern of deviations (variances) can be examined to see if it is possible, or reasonable, to forecast significant departures from the budget.
- We discuss the use of "earned value" (costs derived from the project budget) to monitor and control the project and forecast the project completion time and costs.
- With sufficient warning, it is sometimes possible to implement corrective actions

The pattern of deviation or variances can be examined to see if it is possible or reasonable to forecast significant departure from the budget. So if there is a deviation from what is allocated and what is amount actual spent if there is a deviation that may

directly reflect on the progress of the project. So what we can do we can suggest we can do a corrective actions. So we will discuss the use of earned value that is a cost derived from the project budget to monitor and control the project and forecast the project completion time and cost that we will study in coming lectures. So if there is a variation with a sufficient warning it is sometime possible to implement corrective actions.

The budget expended does not measure the actual level of work completed on the project. It is not necessary every time that when you spending more money means more work is done. So the budget alone therefore is not sufficient to measure of the project's progress. Budgets play an important role in the entire process of management. The first important role is we can control the project.

Importance of budget

- The budget expended (resource usage) does not measure the actual level of work completed on the project.
- The budget alone, therefore, is not a sufficient measure of a project's progress.
- Budgets play an important role in the entire process of management.

Estimating Project Budgets

- In order to develop a budget, we must forecast what resources the project will require, the required quantity of each, when they will be needed, and how much they will cost, including the effects of potential price inflation.
- Uncertainty is involved in any forecast, though some forecasts have less uncertainty than others.

Next we will discuss about estimating the project budget. So in order to develop a budget we must forecast what resources the project will require and the required quantity of each resources and when they will be needed and how much they will cost including

the effect of potential price inflation. So there are uncertainties involved in any forecast though some forecast have less uncertainty than others. So when you forecast the resources required for the project obviously you will be allocating that much money. So you have to consider the uncertainty in the forecast.

Estimating Project Budgets

- An experienced cost estimator can forecast the number of bricks that will be used to construct a brick wall of known dimensions within 1 to 2 percent.
- The errors, however, are apt to be much larger for an estimate of the number of programmer hours or lines of code that will be required to produce a specific piece of software.

So you have to provide some contingency in the allocation of the budget. An experienced cost estimator can forecast number of bricks that will be used to construct a brick wall of known dimension with 1 or 2 percent error. So the errors however are up to be much larger for a estimate of the number of programmers hours or line of code that will be required to produce a specific piece of software. For example if you are preparing a budget for a software programs if the number of codes more then there is a chance for more error in predicting how many hours are required. While the field of software science makes such estimate possible the level of uncertainty is considerably higher and the typical error size is much larger.

So when the project size is more there is a more uncertainty there is a more error in our prediction. In many field cost estimating methods are well codified. For example in the field of a construction cost can often be estimated by scaling the various cost element appropriately. So somebody an construction engineer he can easily predict by looking at the size of the house he can say how much expenditure this will cost. We can go for parametric estimating.

Cost Estimation Method

- While the field of software science makes such estimates possible, the level of uncertainty is considerably higher, and the typical error size is much larger
- In many fields, cost-estimating methods are well codified
- For example, in fields such as construction, costs can often be estimated by scaling the various cost elements appropriately

So the parametric estimating relies on well known statistical correlation between various factors such as the total cost of a house relative to the square feet of living area. Obviously what we can do we can extrapolate it. If the square feet is more then the cost will be more. So we can do such kind of correlation. Suppose somebody doing database for a purchasing department.

Cost Estimation Method

- An experienced producer of books, for example, can leaf through a manuscript and, after asking a few questions about the number and type of illustrations and the quality of paper to be used, can make a fairly accurate estimate of what it will cost to produce a book.

So the database of purchasing department include multitudes of information devoted to the techniques of estimating the quantitative of material labor required to accomplish specific job. So what the point here is suppose the purchasing department they can easily predict about how much materials labors required to accomplish the specific task. So

every business has its own rules of thumb for cost estimating. Just I have given only few example here. For example an experienced producer of books a publisher can leaf through a manuscript and after asking few questions about the number and type of illustration and the quality of the paper to be used he can make a fairly accurate estimate of what it will cost to produce a book.

Cost Estimation Method

- Parametric estimating relies on well-known statistical correlations between various factors such as the total cost of a house relative to the square feet of living area.
- The databases of purchasing departments include multitudes of information devoted to the techniques of estimating the quantities of materials and labor required to accomplish specific jobs.
- Every business has its own rules of thumb for cost estimating

So such experienced publisher by looking at the content he can say what will be the cost of publishing a book. Then we discuss about difficulties in estimating project budget. Developing project budget is much more difficult than developing a budget for more permanent organizational activities. Since the project is unique there are more uncertainties involved. So projecting the cost for project is not easy task.

The influence of history is strong in the budget of an ongoing activity. Sometime we can use historical data for making the project many time. So many entries are simply last year's figure plus certain percentage. Last year x is any number of budgeted fields like it can be lived with or it is a probably acceptable to the person or group who approve the budget. So what we can do we can use historical information last year expenditure plus add certain percentage increase.

Difficulties in Estimating Project Budgets

- Developing project budgets is much more difficult than developing budgets for more permanent organizational activities.
- The influence of history is strong in the budget of an ongoing activity.
- Many entries are simply "last year's figure plus X percent," where X is any number the budgeter feels "can be lived with" and is probably acceptable to the person or group who approves the budgets.

That percentage may be by considering the price rise by considering the inflation. So certain percentage can be increased to get the final figure. Now we will discuss about data gathering for a project budget. So one approach for collecting data is top down budgeting. Obviously the name itself says that the top management they develop a budget that will be sent to the subordinates to the lower level of the organization.

Data Gathering for Project Budget: Top-Down Budgeting

- This strategy is based on collecting the judgments and experiences of top and middle managers, and available past data concerning similar activities.
- These managers estimate overall project cost as well as the costs of the major subprojects that comprise it.

So this strategy is based on collecting the judgments and experience of top and middle managers and available past data concerning similar activities. So the top management people by considering the historical data they allocate the resources. So these managers estimate overall project cost as well as the cost of the major sub projects that comprise it. These cost estimates are then given to the lower level managers who are expected to continue the breakdown into budget estimates for the specific task and work packages comprise the sub project. This process continues to the lowest level.

Data Gathering for Project Budget:
Top-Down Budgeting

- These cost estimates are then given to lower-level managers, who are expected to continue the breakdown into budget estimates for the specific tasks and work packages that comprise the subprojects.
- This process continues to the lowest level.

Data Gathering for Project Budget:
Top-Down Budgeting

- The budget is broken down into successively finer detail, starting from the top, or most aggregated level following the WBS.
- It is presumed that lower-level managers will argue for more funds if the budget allocation they have been granted is, in their judgment, insufficient for the tasks assigned.
- This presumption is, however, often incorrect.

The budget is broken down into successively finer details starting from the top or most aggregated level following our work breakdown structure. So in the top down budgeting it is presumed that the lower level managers will argue for more funds if the budget allocation they have been granted is in their judgment insufficient for the task assigned. Always that lower level managers may have the feeling that the budget allocated is not sufficient. Anytime this presumption however often correct lower level manager may say that they did not allocate enough fund but the top level managers they estimate in a optimistic way. Now we will discuss about advantage of top down budgeting.

Advantage of Top-Down Budgeting

- Aggregate budgets can often be developed quite accurately, though a few individual elements may be significantly in error
- Not only are budget categories stable as a percent of the total budget, the statistical distribution of each is also stable, making for high predictability

Aggregate budgets can often be developed quite accurately though a few individual elements may be significantly in error because in aggregate level when you do the budgeting it can be more accurate. Not only are the budget categories are stable as a percentage of total budget the statistical distribution of each also stable making for high predictability. So far we discussed about top down budgeting. Now we will discuss about bottom up budgeting. So in this method elemental task their schedule and their individual budgets are constructed again following the work breakdown structure.

Data Gathering for Project Budget: Bottom-Up Budgeting

- In this method, elemental tasks, their schedules, and their individual budgets are constructed, again following the WBS.
- The people doing the work are consulted regarding times and budgets for the tasks to ensure the best level of accuracy.

Here the lower level managers they develop the budget. So the people doing the work are consulted regarding times and the budget for the task to ensure the best level of accuracy. Initially estimates are made in terms of resources such as labour hours and materials. These are later converted into dollar equivalent. Standard analytical tools such as learning curve analysis and work samplings are employed where appropriate to improve the estimates.

Data Gathering for Project Budget:
Bottom-Up Budgeting

- Initially, estimates are made in terms of resources, such as labor hours and materials
- These are later converted to dollar equivalents
- Standard analytic tools such as learning curve analysis and work sampling are employed where appropriate to improve the estimates

The difference of opinion are resolved by the usual discussion between senior and junior managers. If necessary the project manager and the functional managers may enter the discussion to ensure that the accuracy of the estimate. The resulting task budgets are aggregated to give the total direct cost of the project. The project manager adds such indirect cost as a general and administrative possibly a project reserve for contingencies and then profit figure to arrive at the final project budget. Here one more the term when we are making the project should remember reserve analysis.

Data Gathering for Project Budget:
Bottom-Up Budgeting

- Differences of opinion are resolved by the usual discussions between senior and junior managers
- If necessary, the PM and the functional manager(s) may enter the discussion to ensure the accuracy of the estimates

Data Gathering for Project Budget:
Bottom-Up Budgeting

- The resulting task budgets are aggregated to give the total direct costs of the project
- The PM adds such indirect costs as general and administrative (G&A), possibly a project reserve for contingencies, and then a profit figure to arrive at the final project budget

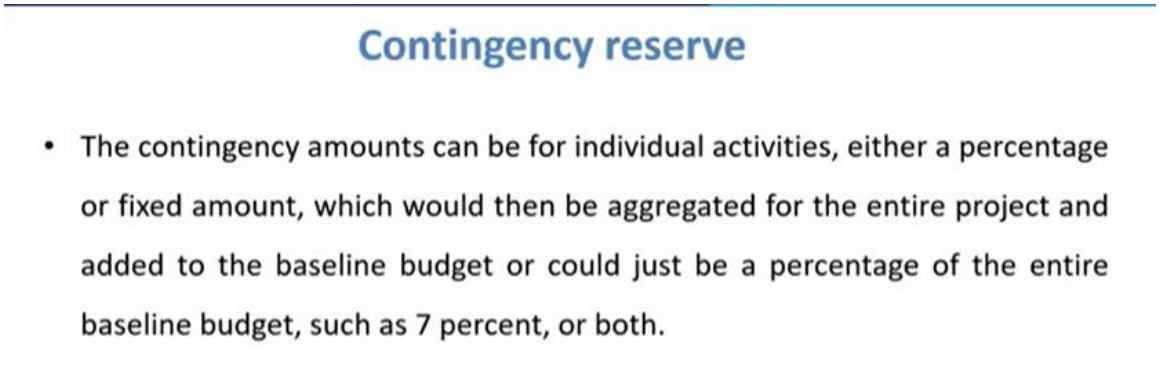
So what is the reserve analysis is it is typically done for the risk in a project that might escalate the cost. So we are giving some provision for the risk. The reserve is included within the baseline budget and it is known as contingency resource because in the project budget we have to provide some unexpected expenses. So that expenses is called contingency.

Reserve Analysis

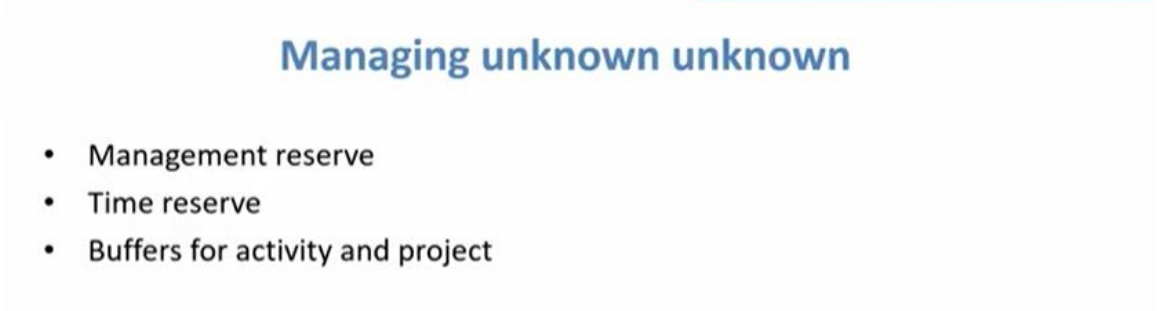
- **A reserve analysis** is typically done for the risks in a project that might escalate the costs.
- The reserve is included within the baseline budget and is known as a contingency reserve.
- It is for the "known unknowns" in the project where the defined responses to the risks are detailed, but their amounts are not yet precisely known.

It is the known "unknown". We know what are the activities but the actual cost we may not know. That is why it is known unknown in the project where the defined responses to the risk are detailed but their amount are not yet precisely known. We know what is the possible unknowns but we do not know the what is the amount for that each unknown. So we have to allocate certain budget for that that is called your contingency resource. So contingency amounts can be an individual activities either a percentage of fixed amount which would then be aggregated for the entire project and added to the baseline

budget or could just be a percentage of the entire baseline budget such as 7 percentage or both.



So what the point here is that the contingency reserve can be allotted for each activity or the contingency can be given to the whole project. Sometime you have to manage the unknown unknown. You may not know what are the possible risk and you may not know what is the possible effect of that risk. So that is done by the management reserve. It is not done by the project that is called management reserve.



Sometime we have to provide some resource for time. We may think that the project may complete 2 years. The activity may be 2 years but we need to provide certain buffer. So that is called your time reserve and the buffer can be provided to activity also or can be provided to the whole project also. Now we will discuss about advantages of bottom-up budgeting.

Advantages of Bottom-Up Budgeting

- The advantages of the bottom-up process are those generally associated with participative management.
- Individuals closer to the work are apt to have a more accurate idea of resource requirements than their superiors or others not personally involved.

The advantages of the bottom-up process are those generally associated with participative management. Since we are discussing about lower level managers, so there will be more involvement from the lower level of our organization for preparing the budget. Individuals closer to the work are apt to have a more accurate idea of resource requirements than their superiors or others not personally involved. In addition to direct involvement of low level managers, in budget preparation increases the likelihood they will accept the result with a minimum of grumbling because since they develop the budget, so that budget will be easily accepted by the lower level people. Involvement also is a good managerial training technique giving junior managers valuable experience in budget preparation as well as the knowledge of operations required to generate the budget.

Advantages of Bottom-Up Budgeting

- In addition, the direct involvement of low-level managers in budget preparation increases the likelihood that they will accept the result with a minimum of grumbling
- Involvement also is a good managerial training technique, giving junior managers valuable experience in budget preparation as well as the knowledge of the operations required to generate a budget

So this is a kind of a training for the lower level managers and they feel more satisfied

because their views, voice are recognized while making the project. Another point here is that bottom-up process sometime it may be risky. See while top-down budgeting is common, true bottom-up budgets are rare. Senior managers see the bottom-up process is risky. The reason is that the senior managers may think that always that the lower level managers will inflate the budget.

Bottom-up process as risky

- While top-down budgeting is common, true bottom-up budgets are rare.
- Senior managers see **the bottom-up process as risky**.
- They tend not to be particularly trusting of ambitious subordinates who may overstate resource requirements in an attempt to ensure success and build empires.

So they tend not to be particularly trusting. The senior level managers, not trusting of ambitious subordinates who may overstate the resource requirement in an attempt to ensure success or build impairs. That is the risk. Besides as senior managers note with some justification, the budget is the most important tool for control of the organization. If you give the budget for, if you ask the lower level managers to prepare the budget, the senior level managers may not have control. They are understandably reluctant to hand over the control to subordinates whose experience and motives are questionable.

Bottom-up process as risky

- Besides, as senior managers note with some justification, the budget is the most important tool for control of the organization.
- They are understandably reluctant to hand over that control to subordinates whose experience and motives are questionable.
- This attitude is carried to an extreme in one large corporation that conducts several dozen projects simultaneously, each of which may last 5 to 8 years and cost millions of dollars.

This attitude is carried to an extreme in one large corporation that conduct several dozen projects simultaneously, each of which may last 5 to 8 years and cost millions of dollars. Now we will discuss about work element costing. The actual process of building a project budget either top-down or bottom-up or a combination of both tends to be a straightforward but it is a tedious process. While the budget may include revenues, the major task in creating the budget, estimating the cost of each of the project's work element, whether you use top-down or bottom-up approach, the tedious task is allocating budget for each work element. Similarly, each work element in the work breakdown structure is evaluated for its resource requirement and the cost of each resources is estimated.

Work Element Costing

- The actual process of building a project budget—either top-down or bottom-up or a combination of both—tends to be a straightforward but tedious process.
- While the budget may include revenues, the major task in creating the budget is estimating the costs for each of the project's work elements.
- Basically, each work element in the WBS is evaluated for its resource requirements, and the cost of each resource is estimated.

Example of Work element costing

- Suppose that a work element is estimated to require 25 hours of labor by a technician
- The specific technician assigned to this job is paid $17.50/hr
- Overhead charges to the project are 84 percent of direct labor charges
- The appropriate cost appears to be

25 hr × $17.50 ×1.84 = $805.00

I will give an example of this work element costing. Suppose that your work element is estimated to require 25 hours of labor by a technician. The specific technician assigned to this job is paid say 17.5 dollar per hour. We consider overhead charges to the project are 84% of the direct labor charges. So the appropriate cost for this work element is 25 hours multiplied by per dollar cost 17.50 multiplied by overhead charges that is 1.84. So we are getting 805 dollars.

25 x 17.50 x 1.84 = 805

Special engineers have noticed that during a normal 8 hours day, no one actually work for all 8 hours. Even on a assembly line, workers need breaks called personal time. This personal time cover such as such activities, visiting the water cooler, going to the restroom, taking a phone call and other time consuming activities engaged in by normal people in a normal workplace. So we have to provide apart from overhead, we have to provide some personal allowances.

Example of work element costing

- Industrial engineers have noted that during a normal 8-hour day, no one actually works for all 8 hours.
- Even on an assembly line, workers need breaks called "personal time."
- This covers such activities as visiting the water cooler, the restroom, making a call home, and all the other time-consuming activities engaged in by normal people in a normal workplace.

A typical allowances for personal time is 12% of total work time. If personal time was not included in the 25 hours estimate made earlier, then the calculation becomes so we have to add another 12% multiplied by 1.12, then 25 hours, then per hour cost 17.5 dollar, then the overhead charges. So we will get 901.6 dollar.

1.12 x 25 x 17.5 x 1.84 = 901.6

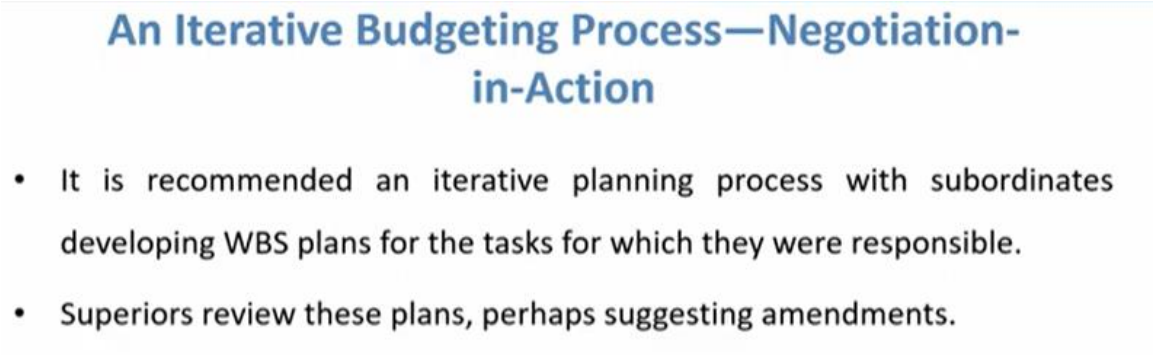
Example of work element costing

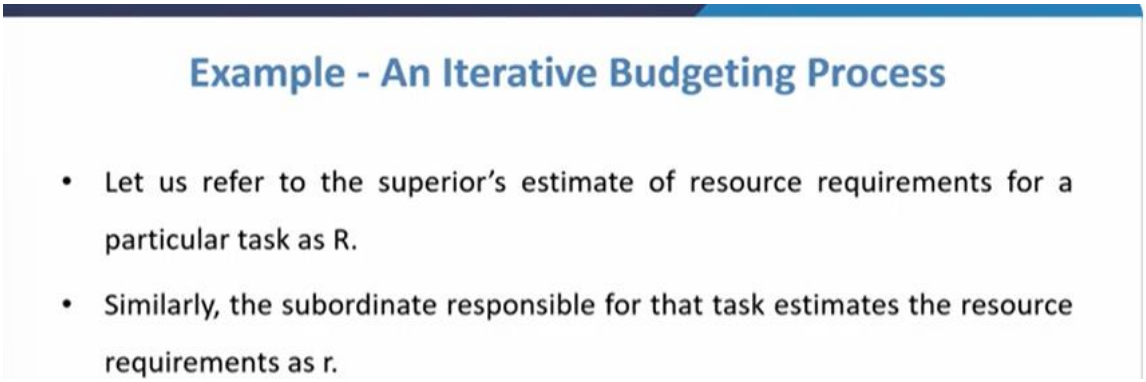
- A typical allowance for personal time is 12 percent of total work time.
- If personal time was not included in the 25-hour estimate made earlier, then the cost calculation becomes

1.12 × 25 hr × $17.50 ×1.84 = $901.60

This is an example of your work element costing. Now we have to, we studied about bottom up top down. Now we need to have a negotiation in the budgeting process. It is recommended that an iterative planning process with the subordinates developing work breakdown structure plans for the task for which they were responsible.

So once as soon as the subordinates develop the budget, this will be discussed at the senior level managers. So here the superiors review this plan, perhaps suggest certain amendments. So between superiors and the subordinates, we need to have a negotiation. So that is called iterative budgeting process.





Now we will take an example of iterative budget process. Let us refer to the superiors estimate of resource requirement for a particular task is R. So the estimate of superiors for a particular task is R. Similarly the subordinates responsible for task estimates, the resource requirement is r. So R is budget provided by the superiors, r is budget provided by the subordinate managers. In a perfect world, R should be equal to r in the sense whatever amount projected predicted by the superiors should be equal to amount projected by the subordinates.

Example - An Iterative Budgeting Process

- In a perfect world, R would equal r.
- As a matter of fact, the probable relationship between the original estimates made at the different levels is $R \ll r$.

As a matter of fact, the probable relationship between the original estimates made at the difference level is R less than equal to r in the sense the subordinates always they inflate the budget and the superiors always underestimate, they provide lesser budget. So what has happened, your R less than the r. So what are the reason that the subordinates cost is more, budget is more than the superiors. So reasons for R less than r. The first, the further one moves up in the organizational chart that is the senior managers, they are away from immediate responsibility for doing the work and it is easier, faster and cheaper the jobs looks to the superior than to the one who has to do that.

Reasons for R<< r

- First, the farther one moves up the organizational chart away from immediate responsibility for doing the work, the easier, faster, and cheaper the job looks to the superior than to the one who has to do it.
- This is because the superior either does not know the details of the task or has conveniently forgotten the details, as well as how long the job takes and how many problems can arise.

Reasons for R<< r

- Second, wishful thinking leads the superior to underestimate cost (and time), because the superior has a stake in representing the project to senior management as a profitable venture.
- Third, the subordinate is led to build in some level of protection against failure by adding an allowance for "Murphy's Law" onto a budget that already may have a healthy contingency allowance.

This is because the superior either does not know the details of the task or has conveniently forgotten the details as well as how long the job takes and how many problems can arise since somebody has gone to the higher level of organizational ladder, they always look that other side, the lower level peoples are not providing the right amount of budget. Second wishful thinking leads the superiors to underestimate the cost and time because the superior has a stake in representing the project to senior management as a profitable venture because the superiors they want to show that that fellow has prepared a profitable project, so that fellow always underestimate the budget. Third, the subordinate is led to build in some level of production against the failure by adding allowances for "Murphy's Law" onto a budget that already may have a healthy contingency allowances. The third reason is that that already there is allowances but still the subordinates will try to add more cost that is why the projection of superior people on the budget is smaller than the subordinates. So, when there is a conflict now we have to go for negotiation in action.

Negotiation-in-Action

- Assuming that the superior and subordinate are reasonably honest with one another (any other assumption leads to a failure in win-win negotiations), the two parties meet and review the subordinate's WBS.
- Usually, the initial step toward reducing the difference in cost estimates is made by the superior who is "educated" by the subordinate in the realities of the job.
- The result is that the superior's estimate rises.

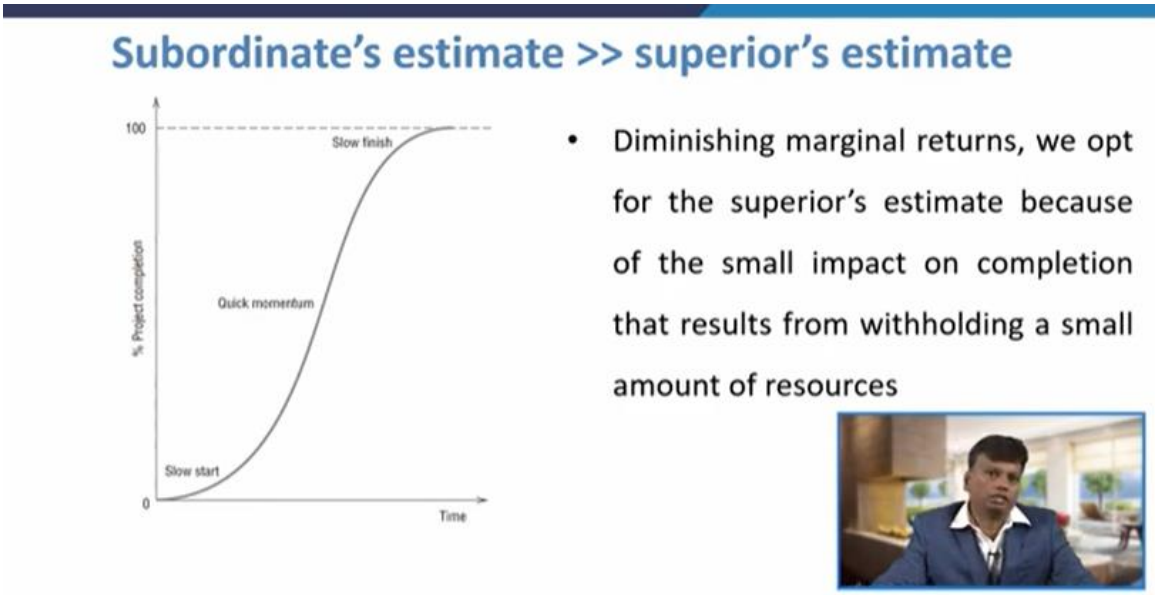
Assuming that the superior and subordinates are reasonably harnessed with one another assume that they want to do a win-win negotiation, the two parties meet and review the subordinates work breakdown structure. Usually the initial step towards reducing the difference in cost estimate is made by the superior who is educated by the subordinates in the realities of the job. Many time the superiors understand he knows about what is the actual amount of budget is required then he may suggest to reduce the task. This result is that the superiors estimate rises, so the superior willing to provide more budget.

Negotiation-in-Action

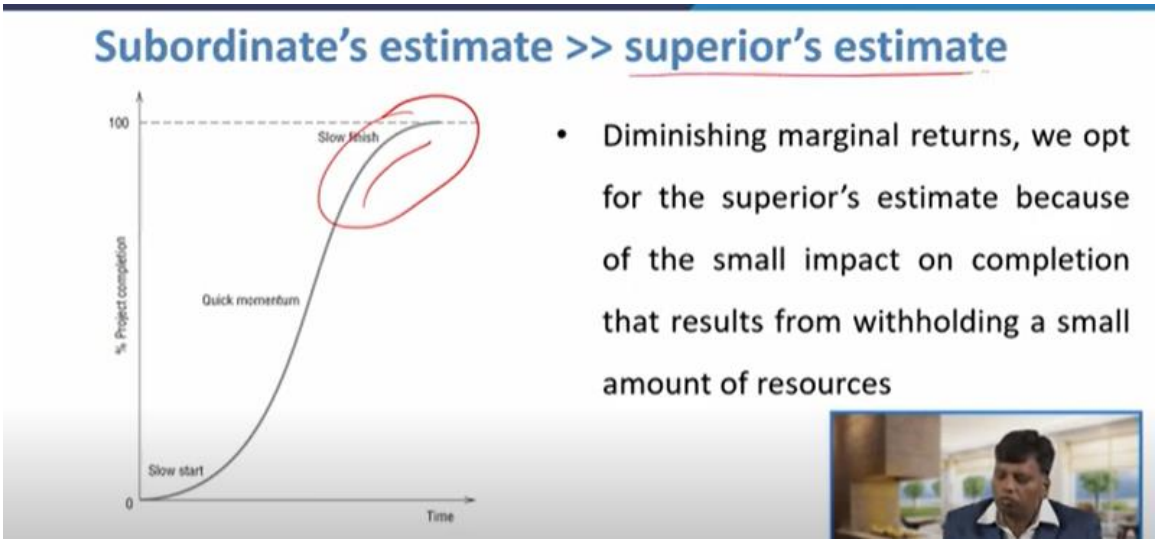
- The next step is typically made by the subordinate.
- Encouraged by the boss's positive response to reason, the subordinate surrenders some of the protection provided for by the budgetary "slop," and the subordinate's estimate falls.
- The subordinate's cost estimate is still greater than the superior's, but the difference is considerably decreased.

The next step is typically made by the subordinate. Encouraged by boss positive response to reason the subordinate surrenders some of the protection provided by the budgetary slope and the subordinate estimates falls. So, the subordinate also willing to reduce their budget, the superiors are willing to increase the budget and subordinate is willing to reduce the budget. So there is a chance for reaching the balance. So the subordinates cost estimate is still greater than the superiors but the difference is

considerably decreased. Even though the budget given by the subordinate is higher than the top management people's budget but the difference is less.

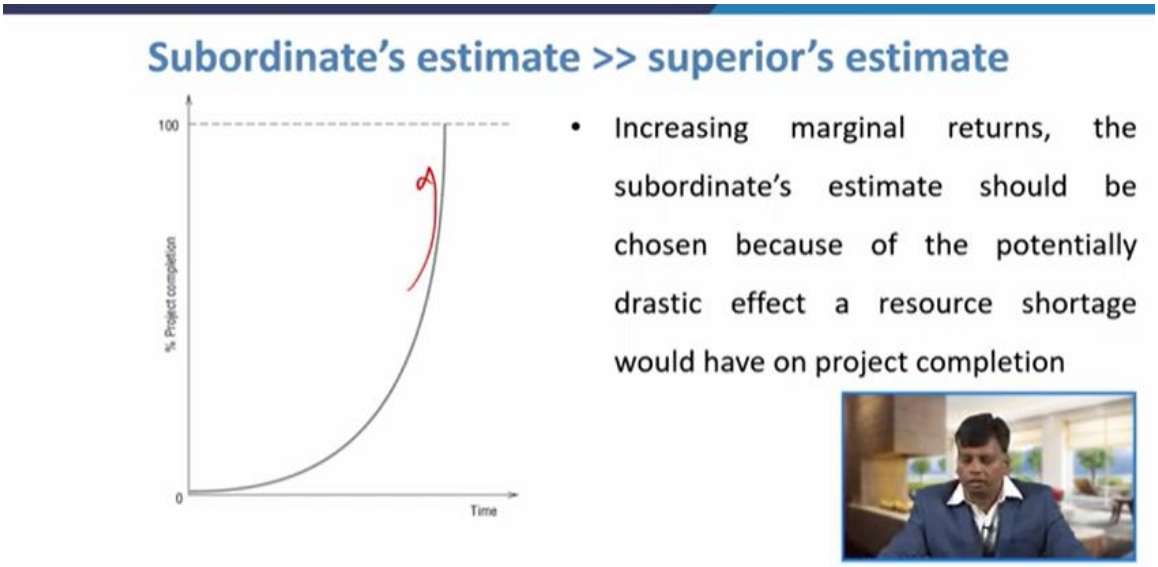


Now what we can do, how to resolve this situation? Now we can refer our project life cycle which I have discussed in the previous lectures. So what is happening the subordinate estimate is greater than the superior estimate. So look at the project life cycle, see this follow an S shaped curve. Here in this portion what is happening diminishing marginal return in the sense even though you add more resources it is not going to increase the output but it is going to diminish the return. So in this situation we opt for superiors estimate because of the small impact on completion that result from withholding a small amount of resources.



Since in this portion, this portion follows diminishing marginal return so it is better to have lesser budget because even by adding more resources there would not be any

outcome. But in case the project is like this, here we talk about increasing marginal return this portion.



Here the subordinate estimate should be chosen because of the potentially drastic effect a resource shortage would have on project completion. So the point here is if the project life cycle is following S shaped curve we have to consider the cost provided by the superiors. So the lesser cost is preferable but if the project follow increasing marginal return then we should follow the subordinate estimate that means we can allocate more resources because if you are not allocating more resources that will affect the completion of the project.

So what I am trying to connect here is there is a close connection between the project life cycle and the project budgeting. Another type of budgeting what we are going to discuss here is category budgeting or activity budgeting. So the traditional organization budget is category oriented often based upon historical data accumulated through a traditional category based cost accounting system. Individual expenses are classified and assigned to basic budget lines such as phone, expenditure on phone, materials, personal electrical, utilities, direct labor to the different production centers and process.

Cost Category Budgeting vs. Project/Activity Budgeting

- The traditional organizational budget is category-oriented often based upon historical data accumulated through a traditional, category-based, cost accounting system
- Individual expenses are classified and assigned to basic budget lines such as phone, materials, personnel-clerical, utilities, direct labor, etc., or to production centers or processes.

	Current			
	Actual	Budget	Variance	Pct.
Corporate—Income Statement				
Revenue				
8430 Management fees				
8491 Prtnsp reimb—property mgmt	7,410.00	6,222.00	1,188.00	119.0
8492 Prtnsp reimb—owner acquisition	.00	3,750.00	3,750.00-	.0
8493 Prtnsp reimb—rehab	.00	.00	.00	.0
8494 Other income	.00	.00	.00	.0
8495 Reimbursements—others	.00	.00	.00	.0
Total revenue	7,410.00	9,972.00	2,562.00-	74.3
Operating expenses				
Payroll & PR benefits				
8511 Salaries	29,425.75	34,583.00	5,157.25	85.0
8512 Payroll taxes	1,789.88	3,458.00	1,668.12	51.7
8513 Group ins & med reimb	1,407.45	1,040.00	387.45-	135.3
8515 Workmen's compensation	43.04	43.00	.04-	100.0
8516 Staff apartments	.00	.00	.00	.0
8517 Bonus	.00	.00	.00	.0
Total payroll & PR benefits	32,668.12	39,124.00	6,457.88	83.5
Travel & entertainment expenses				
8512 Travel	456.65	300.00	156.65-	152.2
8522 Promotion, entertainment & gift	69.52	500.00	430.48	13.9
8523 Auto	1,295.90	1,729.00	433.10	75.0
Total travel & entertainment exp	1,822.07	2,529.00	706.93	72.1
Professional fees				
8531 Legal fees	419.00	50.00	369.00-	838.0
8532 Accounting fees	289.00	.00	289.00-	.0
8534 Temporary help	234.58	200.00	34.58-	117.2

Typical Monthly Category Budget for a Real-Estate Project

So I have brought a typical category budget. So here what this picture says that so there are different category of cost for example one category is revenue, another category is operating expenses, another category is travel and entertainment expenses. So under these categories we are allocating different activities for that activities we say what is the budget and what is the actual and what is the variance and what is the percentage of variance. So this is the traditional way of budgeting but that was the old concept now we talk about project or activity based budgeting. We say ABC activity based costing. So for project what is more important is you have to identify each activity then we have to provide estimate for each activity instead of grouping cost category we have to budget for each activity then you have to monthly you have to say for this activity monthly this much expenditure month 2 this is the expenditure.

Cost Category Budgeting vs. Project/Activity Budgeting

Task	Estimate	Monthly Budget					
		1	2	3	4	5	6
a	2,000	1,300	700				
b	5,000		1,600	3,400			
c	7,000		1,300	4,500	1,200		
d	5,800		2,500	3,300			
e	4,000			2,300	1,000	700	
f	3,000				1,000	1,000	1,000
g	1,000					100	900
	27,800	1,300	6,100	13,500	3,200	1,800	1,900

Budgeting with Agile

- Calculating the initial budget with Agile approaches is less complicated
- It is based on the cost of the scrum team per sprint, the project's duration (derived from the product backlog), and estimates for additional resources

So this is the example of project activity budgeting. Now we will discuss about budgeting for managing a agile project management. So budgeting the initial budget with agile approaches is less complicated. It is based on the cost of the scrum team per sprint the project's duration that is derived from the product backlog and estimates for additional resources. So budgeting for agile project is very straight forward what you have to do? You have to see the cost of scrum team and the duration and estimation of additional resources when you add these three element you will get the budget for a agile project. Because agile utilizes dedicated project team and the sprints are all of the same duration the labor cost of the scrum team are generally fixed per sprint.

Budgeting with Agile

- Because Agile utilizes dedicated project teams and the sprints are all of the same duration, the labor costs of the scrum team are generally fixed per sprint.
- Estimating the project duration is facilitated by having an up-to-date product backlog and by tracking the project team's rate of completing tasks, called its "velocity."

So estimating the project duration is facilitated by having an up to date product backlog and by tracking the project team's rate of completing the task we call this velocity. So by considering this we can easily prepare a budget for a agile project agile based projects. At this point we simply point out that the product backlog and the scrum team's velocity provide a straight forward approach for determining the project cost. Dear students in this lecture I have discussed about importance of project cost management.

Budgeting with Agile

- At this point we simply point out that the product backlog and the scrum team's velocity provide a straightforward approach for determining project costs

Then I discussed about budget and its importance. Later I discussed about method for estimating the project budget. Here I have discussed about top down budgeting and bottom up budgeting and also analyzed about resources for contingency resources for management. Then I discussed about what are the risk of bottom up budgeting. Then I discussed about work element costing.

Next I discussed about iterative budgeting process. Finally I have given some overview about budgeting for a agile project. Thank you. Thank you very much.