SOFTWARE ENGINEERING ECONOMICS

SE 361

Lecture-06-07

Muhammad Waseem

WORD OF WISDOM

- " Prophet Muhammad (sal Allahu alaihi wa sallam) says “.If you put your whole trust on Allah, as you have to, He most certainly will satisfy your needs, as He satisfies those of the birds. They come out hungry in the morning, but return full to their nests." (Tirmidhi)."

BUSINESS DECISIONS

THE FUNDAMENTAL CONCEPTS OF BUSINESS DECISIONS

- There is a set of concepts fundamental to aligning technical decisions with the organization's purpose.
- These include
  - Proposals
  - Cash-flow instances
  - Cash-flow streams
  - Cash-flow diagrams

PROPOSAL

- Proposal is a single, separate option that is being considered for
  - Carrying out a particular software development project or not.
  - enhance an existing program
  - or might be use for redevelop that same software from scratch.
  - Each proposal represents a unit of choice
    - either you can choose to carry out that proposal or you can choose not to.

The whole purpose of business decision making is to figure out, given the current business circumstances, which proposals should be carried out and which ones shouldn't.

BUSINESS PROPOSAL

- A business proposal is a written offer from a seller to a buyer prospective .
- *Business proposals are often a key step in the complex sales process—i.e., whenever a buyer considers more than price in a purchase.*

There are three distinct categories of business proposals:

- Formally solicited
- Informally solicited
- Unsolicited.

FORMALLY SOLICITED

- Solicited proposals are written in response to published requirements, contained in a Request for Proposal (RFP), Request for Quotation (RFQ), or an Invitation For Bid (IFB).

FORMALLY SOLICITED *CONT…*

- **An invitation for suppliers, often through a bidding process, to submit a proposal on a specific product or service.**
- **RFPs provide detailed specifications of what the customers wants to buy.**
- **Sometimes include directions for preparing the proposal.**
- **Evaluation criteria the customer will use to evaluate offers.**
- **Customers issue RFPs when their needs cannot be met with generally available products or services.**
- **Proposals in response to RFPs are less than 10 pages and sometimes reach 1,000's of pages.**
- **The RFP process brings structure to the procurement decision and allows the risks and benefits to be identified clearly upfront.**

Request for proposal

FORMALLY SOLICITED *CONT…*

Key objectives

- Obtain correct information to enable sound business decisions.
- Decide correctly on strategic procurement
- Influence the company's purchasing power to obtain a favorable deal.
- Enable a broader and creative range of solutions to be considered.

Request for proposal

FORMALLY SOLICITED *CONT..*

Key benefits

- **Informs suppliers that your company is looking to procure and encourages them to make their best effort.**
- **Requires the company to specify what it proposes to purchase.**
- **Alerts suppliers that the selection process is competitive.**
- **Allows for wide distribution and response.**
- **Ensures that suppliers respond truthfully to the identified requirements.**
- **By following a structured evaluation and selection procedure an organization can demonstrate neutrality -**

Request for proposal

REQUEST FOR QUOTATION
OR
INVITATION FOR BID

- A request for quotation (RFQ) is a standard business process whose purpose is to invite suppliers into a bidding process to bid on specific products or services.
- RFQ generally means the same thing as IFB (Invitation For Bid)

REQUEST FOR QUOTATION
OR
INVITATION FOR BID

- An RFQ typically involves more than the price per item. Information like payment terms, quality level per item or contract length are possible to be requested during the bidding process.

پیشکش مطلوب ہے

چلڈرن لائبریری کمپلیکس لاہور محکمہ تعلیم کا ادارہ جس کے ملازمین کا جی پی فنڈ کیلئے اکاؤنٹ کھولنا مطلوب ہے۔ سرکاری و غیر سرکاری بنک اپنے انٹرسٹ / منافع ریٹ مورخہ 16-11-2012 صبح 11:00AM تک ارسال کردیں بعد میں آنے والے کو شامل نہیں کیا جائے گا۔

IPL-14745 **المشتھر: پروجیکٹ ڈائریکٹر**

چلڈرن لائبریری کمپلیکس 4۔شارع ایوان تجارت' لاہور

SAVE ELECTRICITY - USE ELECTRICITY SPARINGLY BETWEEN 6:00 P.M TO 10:00 P.M

MULTAN ELECTRIC POWER COMPANY

INVITATION FOR BIDS

Date	12.03.2013
Loan No. and Title	2972- PAK. Power Distribution Enhancement Investment Program, Tranche-III
Contract No. and Title	**ADB-TRANCHE- III- MEPCO -02: Procurement of Plant, Design, Supply Installation, Testing and Commissioning of five (5) No. Conversion from 66KV to 132 KV (AIS) Grid Stations on turnkey basis at Lot-I :- CHAK-83/12-L and DAHRANWALA Lot-II:- FAQIRWALI, FORTABBAS and SHAH SADAR DIN**
Deadline for Submission of Bids	26.04.2013

1. The Islamic Republic of Pakistan has applied for a loan from the Asian Development Bank (ADB) towards the cost of Power Distribution Enhancement Investment Program, Tranche-III Part of this loan will be used for payments under the contract named above. Bidding is open to bidders from eligible source countries of the ADB.
2. The Multan Electric Power Company Limited ("the Employer") invites sealed bids from eligible bidders for the construction and completion of the following ("Facilities")
   "Procurement of Plant, Design, Supply, Installation, Testing and Commissioning of five (5) No. conversion from 66KV to 132 KV (AIS) Grid Stations on turnkey basis at
   Lot-I :- CHAK-83/12-L and DAHRANWALA
   Lot-II :- FAQIRWALI, FORTABBAS and SHAH SADAR DIN
   Bidders may bid for one or both lots.
3. International competitive bidding will be conducted in accordance with ADB's **Single-Stage: One Envelope Procedure.** Only eligible Bidders with the following key qualification should participate in this bidding:
   (a) Participation as contractor, management contractor, or subcontractor, in at least two (2) contracts within the last ten **(10) years**, each with a value of at least **US$ 4.0 million for Lot-I & US$ 5.6 million for Lot-II** that have been successfully or are substantially completed and that are similar to the proposed plant and services. The similarity shall be based on the physical size, complexity, methods, technology or other characteristics as described in Section 6 (Employer's Requirements).
   (b) The manufacturer / supplier should have sound financial status. The difference between cash in hand and short term liabilities should be positive. Minimum average annual turnover should be of **US$ 10.0 million for Lot-I US$ 14 million for Lot-II** calculated as total certified payments received for contracts in progress or completed, within the last five (5) years.
4. To obtain further information and inspect the bidding documents, bidders should contact:
   Chief Engineer (Development) MEPCO
   Conference Room, 1st Floor, Circle Office,
   Khanewal Road, Multan, Pakistan.
   Telephone: +92-61-9210377 Fax No: +92-61-9210347
   Email: cedevmepco@gmail.com
5. To purchase the bidding documents in English, eligible biders should:
   - Write to address above requesting the bidding documents for **ADB-TRANCHE-III-MEPCO-02 (ICB): Procurement of Plant, Design, Supply, Installation, Testing and Comissioning of five (5) No. conversion from 66KV to 132KV (AIS) Grid Stations on turnkey basis at**
     Lot I :- CHAK-83/12-L and DAHRANWALA
     Lot II :- FAQIRWALI, FORTABBAS and SHAH SADAR DIN
   - pay a non- refundable fee of **Rs. 10,000 or US$ 100.** The method of payment will be by bank draft in favor of Multan Electric Power Company, Khanewal Road Multan (Pakistan). The documents may be collected in person or may be sent by express airmail for an additional fee of **Rs. 2,000** for domestic delivery or US$ 100 for overseas delivery. No liability will be accepted for loss or late delivey.
6. Deliver your bid:
   - To the address above
   - On or before the deadline 26.04.2013 11:00 AM
   - All bids must be accompanied by a Bid Security in the amount specified in the bidding documents issued by MEPCO.

   Bids will be opened immediately after the deadline in the presence of bidders representatives who choose to attend.
7. MEPCO will not be responsible for any costs or expenses incurred by bidders in connection with the preparation or delivery of bids.
8. When comparing Bids, ADB's Domestic Preference Scheme will be applied in accordance with the provisions stipulated in the Bidding Document.

COMPONENTS FORMALLY SOLICITED PROPOSAL

1. **Requirements Matrix,** which matches customer requirements with the paragraph and page numbers of where those requirements are addressed in the proposal
2. **Executive Summary,** which outlines the primary benefits of the vendors' solutions to the customer's requirements
3. **Technical Volume**, which demonstrates how each requirement will be met
4. **Management Volume**, which describes how the program will be managed
5. **Cost Volume**, which provides all costing data, as well as implementation plans and schedules

COMPONENTS INFORMALLY SOLICITED PROPOSAL

6. A **description** of the seller's capabilities or products
7. **A discussion** of key issues
8. **A description of the buyer's** specifications and how they will be met
9. **The cost** of the offering
10. **A schedule for delivery** of the products or services
11. **Proof of prior experience** i.e. Testimonials from previous customers, Descriptions of previous projects

INFORMALLY SOLICITED PROPOSALS

- Are typically the result of conversations held between a vendor and a prospective customer.
- The customer is interested enough in a product or service to ask for a proposal.
- Typically, the customer does not ask for competing proposals from other vendors.
- This type of proposal is known also known as sole-source proposal.
- There are no formal requirements to respond to, just the information gleaned from customer meetings. These proposals are typically less than 25-pages, with many less than 5 pages.

UNSOLICITED PROPOSALS

- Unsolicited proposals are marketing brochures.
- The term "marketing brochure" refers to a small document, or pamphlet, which describes and promotes various products or services to be marketed.
- Vendors use them to introduce a product or service to a prospective customer.
- .

UNSOLICITED PROPOSALS

- They are always generic, with no direct connection between customer needs or specified requirements.
- They are not designed to close a sale, just introduce the possibility of a sale

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- Question /Answer

CASH-FLOW INSTANCES AND CASH-FLOW STREAMS

- To make a meaningful business decision about any specific proposal, that proposal must be evaluated from a business perspective.
- The concepts of cash-flow instances and cash-flow streams are used to describe the business perspective of a proposal.

CASH-FLOW INSTANCES AND CASH-FLOW STREAMS

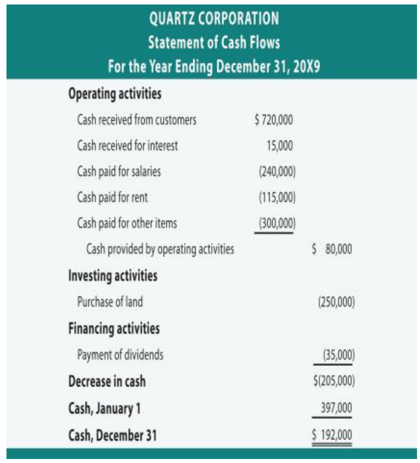
- A cash-flow instance is a specific amount of money flowing into or out of the organization at a specific time as a direct result of some proposal.
- Example:
  - In a proposal to develop and launch Product X, the payment for new development computers.
  - if new hardware is needed, could be an example of an outgoing cash-flow instance. Money would need to be spent to carry out that proposal.

QUARTZ CORPORATION
Statement of Cash Flows
For the Year Ending December 31, 20X9

Operating activities		
Cash received from customers	$ 720,000	
Cash received for interest	15,000	
Cash paid for salaries	(240,000)	
Cash paid for rent	(115,000)	
Cash paid for other items	(300,000)	
Cash provided by operating activities		$ 80,000
Investing activities		
Purchase of land		(250,000)
Financing activities		
Payment of dividends		(35,000)
Decrease in cash		$(205,000)
Cash, January 1		397,000
Cash, December 31		$ 192,000

CASH-FLOW INSTANCES AND CASH-FLOW STREAMS

- The term cash-flow stream refers to the set of cash-flow instances, over time, which would be caused by carrying out some given proposal.
- The cash-flow stream is, in effect, the complete financial picture of that proposal.
  - How much money goes out?
  - When does it go out?
  - How much money comes in?
  - When does it come in?



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CATEGORIES OF CASH FLOW

- Cash-flow streams usually contain the following categories of cash flow
  - Initial Investment
  - Operation and Maintenance Cost
  - Sales Income
  - Cost Avoidance
  - Salvage Value

INITIAL INVESTMENT

- The initial investment captures all of the one-time, nonrecurring costs associated with starting up a proposal.
- In a software project proposal, the initial investment might include
  - hiring and/or training the development and QA staff,
  - buying and installing new computers or related equipment,
  - obtaining facilities for the project team to work in, and so on.

OPERATION AND MAINTENANCE COST

- Operation and maintenance costs occur only after the activity is started and continue through to its retirement.
- In a software project proposal, operation and maintenance costs could include things such as the following:
  - Electricity to operate the computers and heat or cool the building
  - Support staff to keep the computers and the network running
  - Maintenance costs on software licenses
  - Paper, disks, and other typical office supplies

SALES INCOME

- Sales income refers to the direct income generated by the proposal.
  - Maybe the proposal creates a new product.
  - Or maybe the proposal increases the market share of an existing product.
  - Either way, the proposal could be generating income for the organization.

COST AVOIDANCE

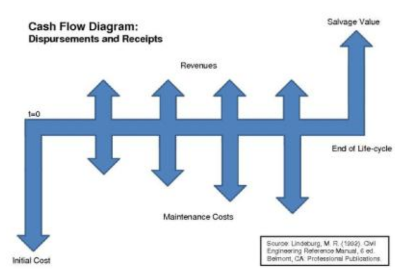
- Less-obvious, but still very important, source of income is cost avoidance.
- Cost avoidance is not directly income in the sense of somebody paying for a product or service,
- it reduces the expenses needed to produce those products and services
- it leaves more of the gross revenue as profit

SALVAGE VALUE

- Salvage value refers to any remaining value in assets (equipment, facilities, etc.) at the end of a proposal.
- The salvage value of a computer, for instance, is the amount that you expect the computer can be sold for when you are ready to get rid of it.

CASH-FLOW DIAGRAMS

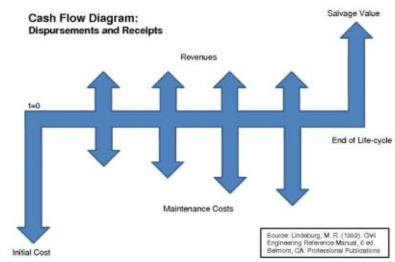
- A cash-flow diagram is a picture of a cash-flow stream.
- The cash-flow diagram gives the reader a very quick overview of the financial picture of that subject



CASH-FLOW DIAGRAMS

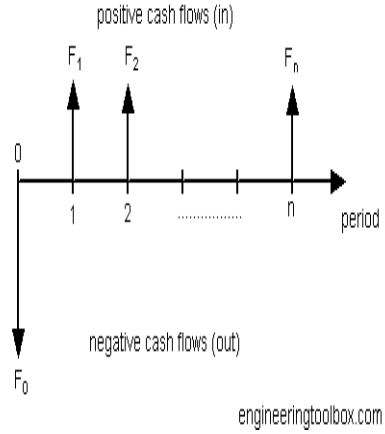
- A cash-flow diagram shows the cash-flow stream two dimensions:
  - Time runs from left to right, a
  - Amounts of money run up and down.
- Each cash-flow instance is drawn on the diagram at a left-to-right position relative to the timing of that cash flow after the start of the proposal.
- The horizontal axis is divided into units of time that represent either
  - years, months, weeks, etc.

    (as appropriate for the proposal being studied.)



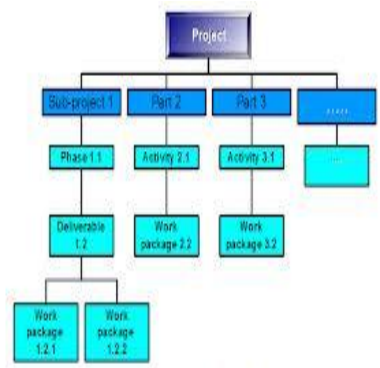
CASH-FLOW DIAGRAMS

- The other dimension, the amount of the cash-flow instance, is shown as an upward or downward arrow.
- Upward arrows mean that money is coming in (income), and downward arrows mean that money is being spent (expense).
- The lengths of the arrows are usually drawn proportional to the amount of money; for instance, a cash-flow instance that's twice as much money as another would be drawn with an arrow that's twice as long.
- The actual amounts of the cash-flow instances are usually written on the diagram next to the arrows because it's hard to get an accurate interpretation of the amount from the length of the arrow alone.



DEVELOPING CASH-FLOW STREAMS

- One common way to develop the cash-flow stream for a proposal is to create a work breakdown structure (WBS).
- The WBS is a hierarchical decomposition that lists all the work associated with the proposal being studied.
- A common notation for a WBS is to show levels of decomposition by indenting



(Example of WBS)

EXAMPLE OF WBS

- An example WBS for buying and operating a car might be as follows
  - Own and operate a car for transportation
    - Buy the car
    - Pay the down payment
    - Pay the taxes, licensing, and registration fees
    - Get insurance on the car
    - Make the monthly car-loan payments
  - Operate and maintain the car
    - Pay the semiannual insurance payments
    - Fill the car with gas when needed
    - Change the oil every 3000 miles
    - Other routine maintenance as needed
  - Sell the car

THINGS TO DO- YOU

1. Reading Assignment Of Cash-flow diagrams from different perspectives
2. Organize your self into group of 2 and send your registration no and Name by tomorrow

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- Question /Answer