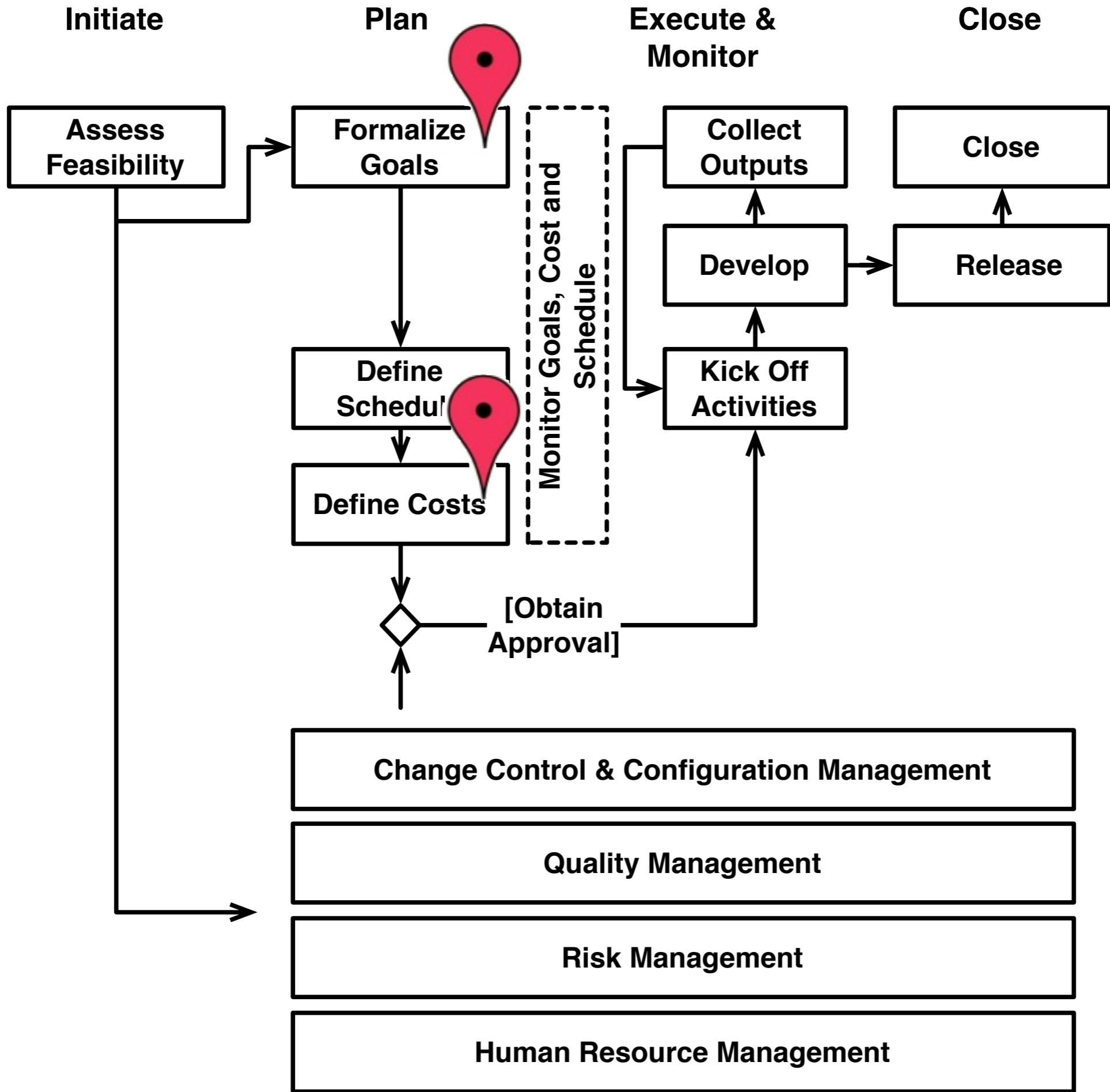


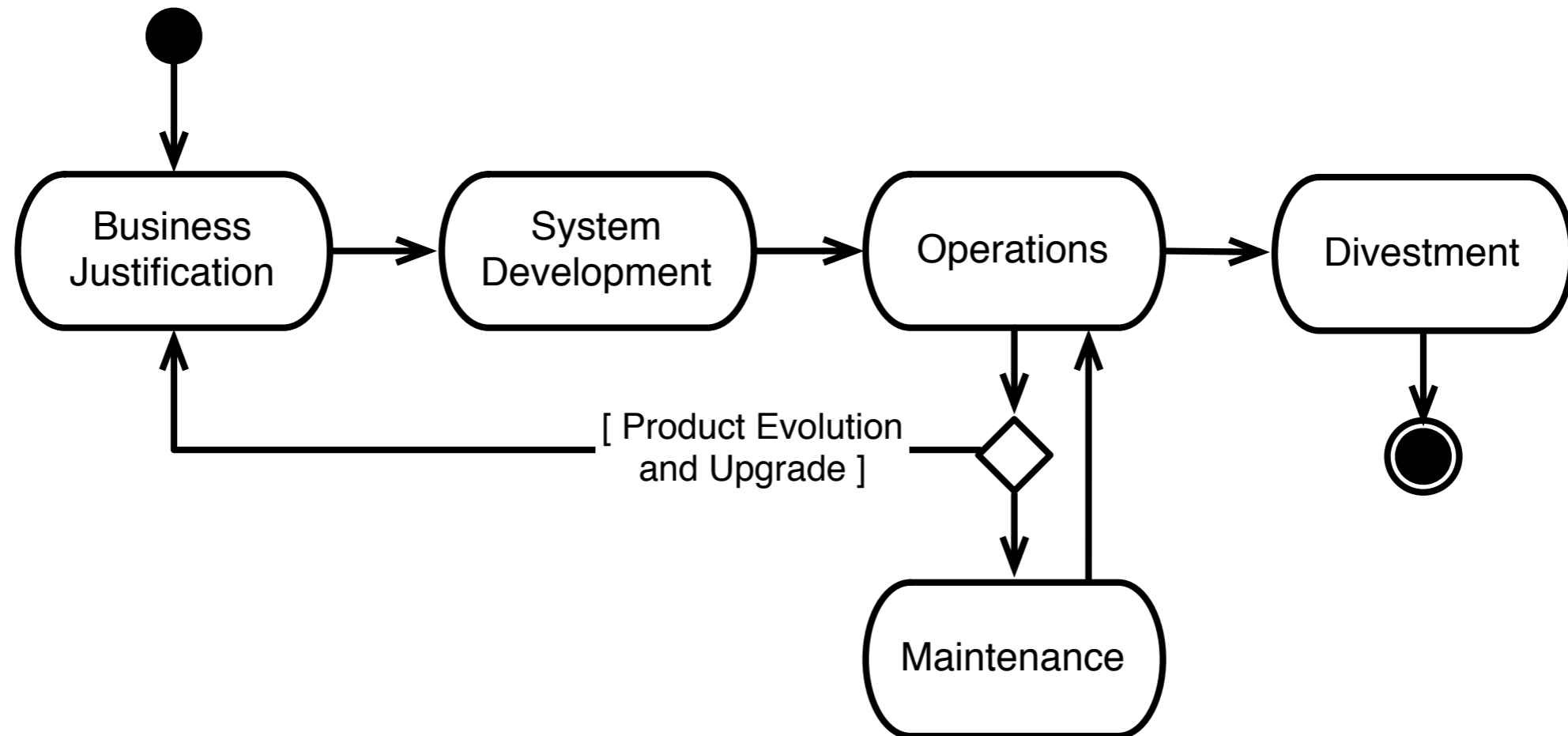
Project Pricing

Goals of the Unit

- Understanding what are the main factors determining project and project outputs price
- Learn some strategies to determine price
- Understanding in more details the procurement process



Project/Product Lifecycle



- **All phases (including divestment)** are a source of cost, investment, or revenue
- We can quote the project products or the project itself (or both, if you are very lucky)

Pricing Models

Software Pricing

- Three different models to determine software price:
 - Based on **Cost**
 - * Based on the production costs
 - * However for some: production costs can be thought as sunk costs (once the system is ready): at a bare minimum, software should cover operating costs
 - Based on **Value**
 - * Based on the value perceived by the client
 - * Different factors can be used to change the perceived value: reputation, sentiment, market segmentation (pro/base)
 - Based on **Competition**
 - * Based on the price set by the competition

Selling, Licensing, or Leasing

- **Ownership** (of source code and executables) is an important factor in determining software price
- Software is usually **licensed** (grant to use it), like many other digital assets (e.g. music, books)
- License granting schema include:
 - By the copy
 - In bulk (user, seat, maximum number of instances)
- **Leasing** is an alternative schema in which the use of the software is granted for a limited time
 - Lower price
 - Protection mechanisms are necessary

Open Source and Free Software

- Many different licenses:
 - MIT, Apache, Mozilla, BSD, GNU, ... (<http://opensource.org/licenses>)
- Characterizations:
 - Rights: free use, access to source code
 - Duties: license of modified portions, license of tools built with the open source components
- Commercial exploitation:
 - Some licenses allow to build commercial software
 - Freemium services
 - Installation, training, documentation, gadgets, donations
- Commercial exploitation is not the only benefit for an organization (community building, support, advertisement, ...)

Project Pricing

$$\text{price} = \text{profit} + \text{costs}$$

[Source: Maylor, Project Management]

- Similar to software pricing, project pricing has three strategies
 - Fix the price: pricing to win
 - Fix the costs: target costing
 - Fix the profit (percentage on actual costs)

Contractual Agreements

Typical Contractual Agreement

- Client and contractor have opposing goals in setting price and schedule payments
- Contracts regulate this opposing goals by sharing risks on results and payments

E.g.:

- Startup: payment upfront (client exposed)
 - Project execution: contractor exposed
 - Project delivery: both happy (... or unhappy)
- Different agreement schema can be used to “negotiate” these different goals

Fixed Price Contract

- **Fixed Price Contract** is a kind of agreement where the prices is fixed at the beginning.
- Considerations:
 - Accurate estimations are needed
 - The client might end up paying more (since contingency has to be taken into account)
 - The supplier might risk losing money
 - As pointed out in Wysocki (2011), "all potential suppliers might agree on a fixed price, but this could be a way to just get in the door and work the details later"

Time and Materials

- **Time and Materials** is a kind of agreement in which the **vendor exposes the costs to the client and bills the client according to the actual costs incurred into**. The vendor to track activities and actual time spent in the project.
- Considerations:
 - Need to keep formal records of time spent (e.g. time sheets of personnel; actual proof of expenditures - travels, ...)
 - Risk of cost overruns/inefficiency/low productivity
 - The agreement works well in situations with a high uncertainty or volatility of requirements, since it shares the project risks between the two contracting parties.

Retainer

- **Retainer** is a kind of contract in which a fixed price is paid to the vendor in change of a fixed amount of time provided.
- The fee is paid in advance and the work to performed defined later
- Considerations:
 - It is equivalent to renting man-power
 - Best if requirements are not clear
 - Reporting necessary
 - It might be based on a personnel fee lower than in the time and material case (after all, it is paid in advance)
 - Payments might be split in regular periods (e.g. monthly)

Cost Plus

- **Cost Plus** is a kind of agreement in which the **buyer pays a contractor for all allowed expenses up to a set limit**. An **additional payment is foreseen that allows the contractor to make a profit** if certain conditions are met.
- Types of cost plus contracts:
 - **Award-fee contracts**, if the additional payment is bound to the final quality of the product
 - **Incentive fee contracts**, if the additional payment is bound to contracts that meet or exceed the performances
 - **Fixed-fee contract**, if the fee may be adjusted as a result of changes in the work to be performed under the contract. (risky for the vendor - see also considerations about fixed price)
- Considerations:
 - It shares project risks between client and supplier
 - These kind of agreements are applied by Government Agencies
 - Cost-plus can be used when efficiency, quality, or improved performances are a desirable feature
 - It make more difficult to control cost overruns.
 - Additionally, this kind of agreement requires additional book-keeping, e.g. to verify that all the expenditures exposed by the contractor are eligible.

Contractual Agreements and Project Budget

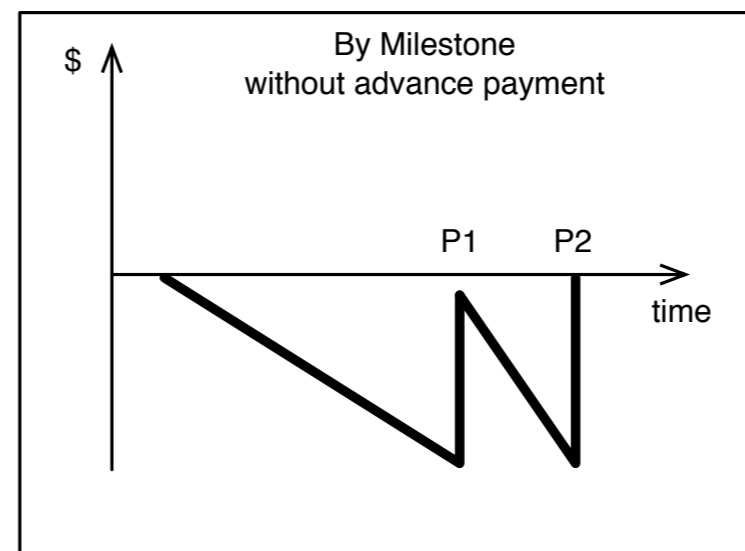
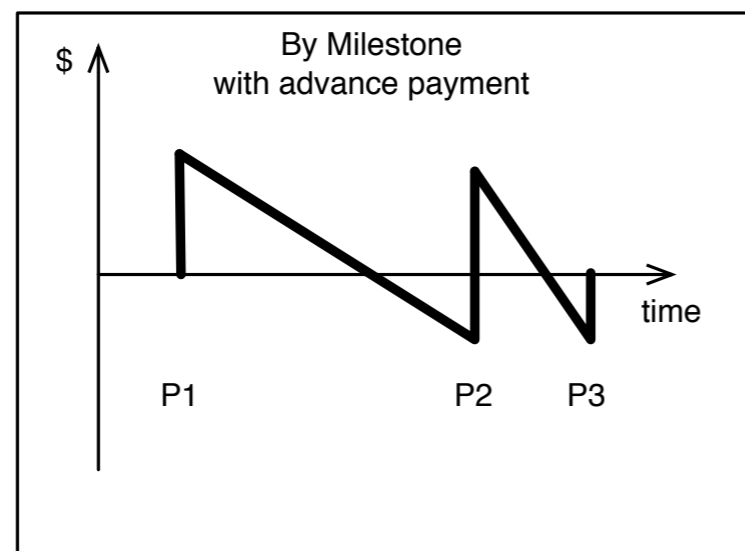
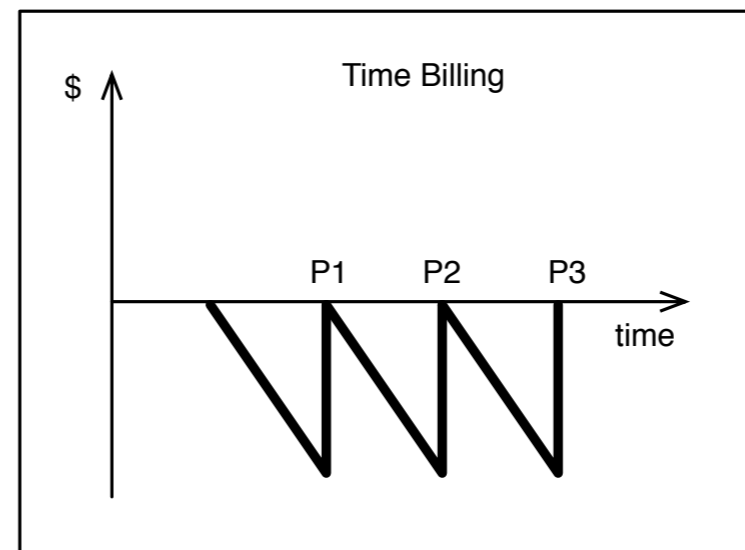
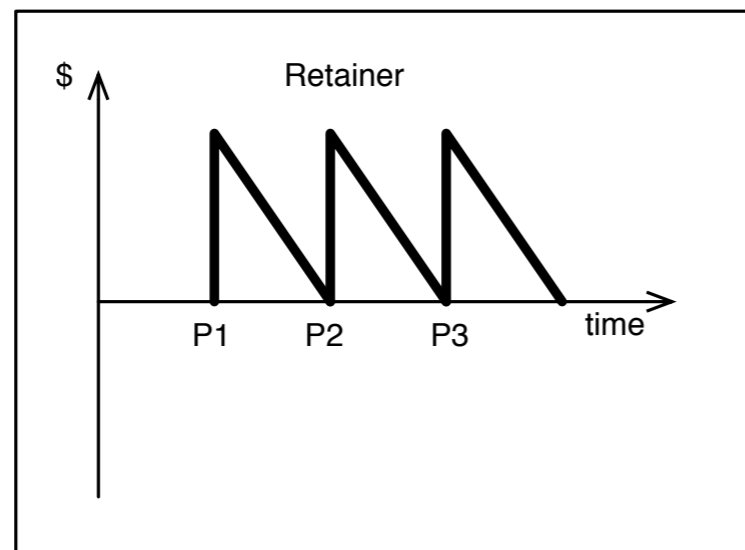
- Payment schedules need to be regulated to balance risks (financial exposure of the contractor) and commitment (investment before results are delivered)
- Consider the extreme cases: pay before the project starts; pay after the project ends
- When reasoning from a purely economical point of view, the cost to finish (and not the sunk costs) determine whether it makes sense to continue a project or not

Typical Payment Structures

- Based on actual outputs:
 - Payments **based on deliverables**: each significant deliverable determines a payment based on the planned cost to produce it
- Based on time spent:
 - Payments are performed on a regular basis, based on the actual time spent
 - It requires maintaining timesheets and receipts/proofs of expenditures
 - It requires checks and administrative work on both sides
- Based on project progress:
 - An **advance payment** is awarded at project start to cover initial costs and show the client's commitment
 - A **closing payment** is awarded after the project end, to ensure enough time is given to the client to test the system, while retaining the interest of the supplier on the project

Payments and Cash Flow

- The level of investment of the supplier depends on the payment schema



Procurement and Outsourcing

The Procurement Process

- Many projects require procuring services and products from other vendors
- The process is typically initiated and controlled by the project manager with the support of the performing organization
- According to the performing organization, various constraints can affect the margin of maneuver of the project manager and the timing of activities
- An appropriate time has to be allocated for procurement activities to complete and sufficient resources to monitor the process

The Procurement Process

- **Identify needs** the actual procurement needs are individuated and set.
- **Identify and select vendors:**
 - solicitation,
 - selection,
 - awarding
- **Manage contract execution**
- **Accept final product** this is the phase during which the product is accepted.

Solicitations

- What can be done depends upon legal and organizational constraints
- Invitation to tender is publicized and made available in one of these three modalities:
 - Open tender ... everyone is invited to submit and apply
 - Restricted tender ... a selected number of vendors is invited to submit
 - Direct call ... just one
- Motivations:
 - Managing the trade-off between costs (open tenders yield more competitive offers), quality (restricted and direct calls might reduce uncertainty over quality), and time (direct call is the fastest)

Invitation to Tender

- Minimum information set includes:
 - **Specification of the products or services to be provided:**
a statement of work defining what is the output of the project
 - **Constraints** related to the contract, such as timing, quality/reliability/adherence to standards, required support after the contract ends, management of intellectual property rights.
 - **Modalities to submit the proposal** and, in the case of public selections, the **selection criteria which will be used to award the contract.**

Open Tender Timing Considerations

- Open and restricted tenders might require a significant amount of time (e.g. months) from idea to actual delivery
- Consider time for the following activities:
 - The **preparation of the invitation to tender**, which defines the requirements (notice that the terms are difficult and costly to change, once the tender is out)
 - **Sufficient time for potential bidder to become aware of the bid and properly respond.** For open tenders, the time in Italy is a minimum of 50 days. More time can be taken into account for complex projects
 - Time **to evaluate the proposals** received
 - Time **to award the contract**
 - **Time for the contractor to actually deliver the products or services agreed upon**