

The background of the slide features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side and bottom of the frame, creating a modern, dynamic feel. The main text is positioned on the left side of the slide, set against a plain white background.

Chapter 5

Software Project Planning

Software Project Planning

The overall goal of project planning is to establish a pragmatic strategy for controlling, tracking, and monitoring a complex technical project.

Why?

*So the end result gets done on time,
with quality!*

The Steps

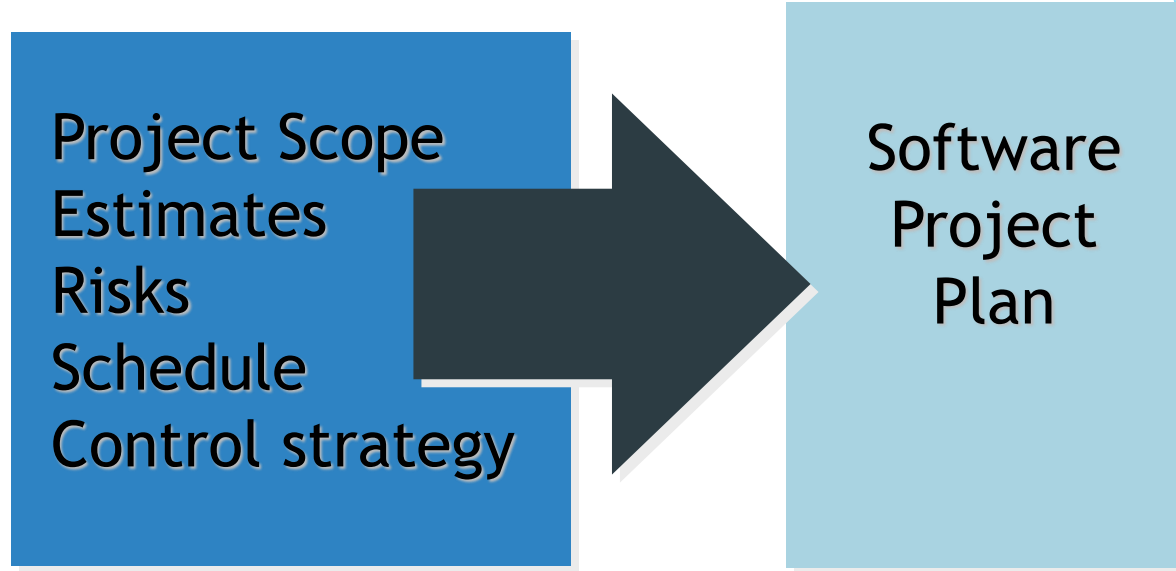
- ▶ **Scoping**—understand the problem and the work that must be done
- ▶ **Estimation**—how much effort? how much time?
- ▶ **Risk**—what can go wrong? how can we avoid it? what can we do about it?
- ▶ **Schedule**—how do we allocate resources along the timeline? what are the milestones?
- ▶ **Control strategy**—how do we control quality? how do we control change?

To Understand Scope ...

- ▶ Understand the customers needs
- ▶ understand the business context
- ▶ understand the project boundaries
- ▶ understand the customer's motivation
- ▶ understand the likely paths for change
- ▶ understand that ...

*Even when you understand,
nothing is guaranteed!*

Write it Down!



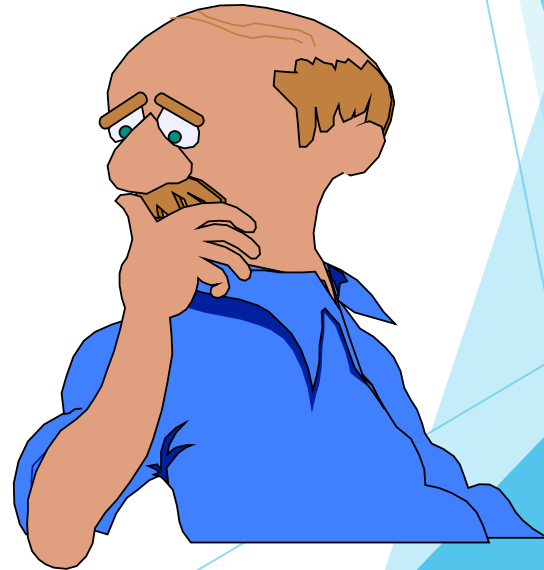
Cost Estimation



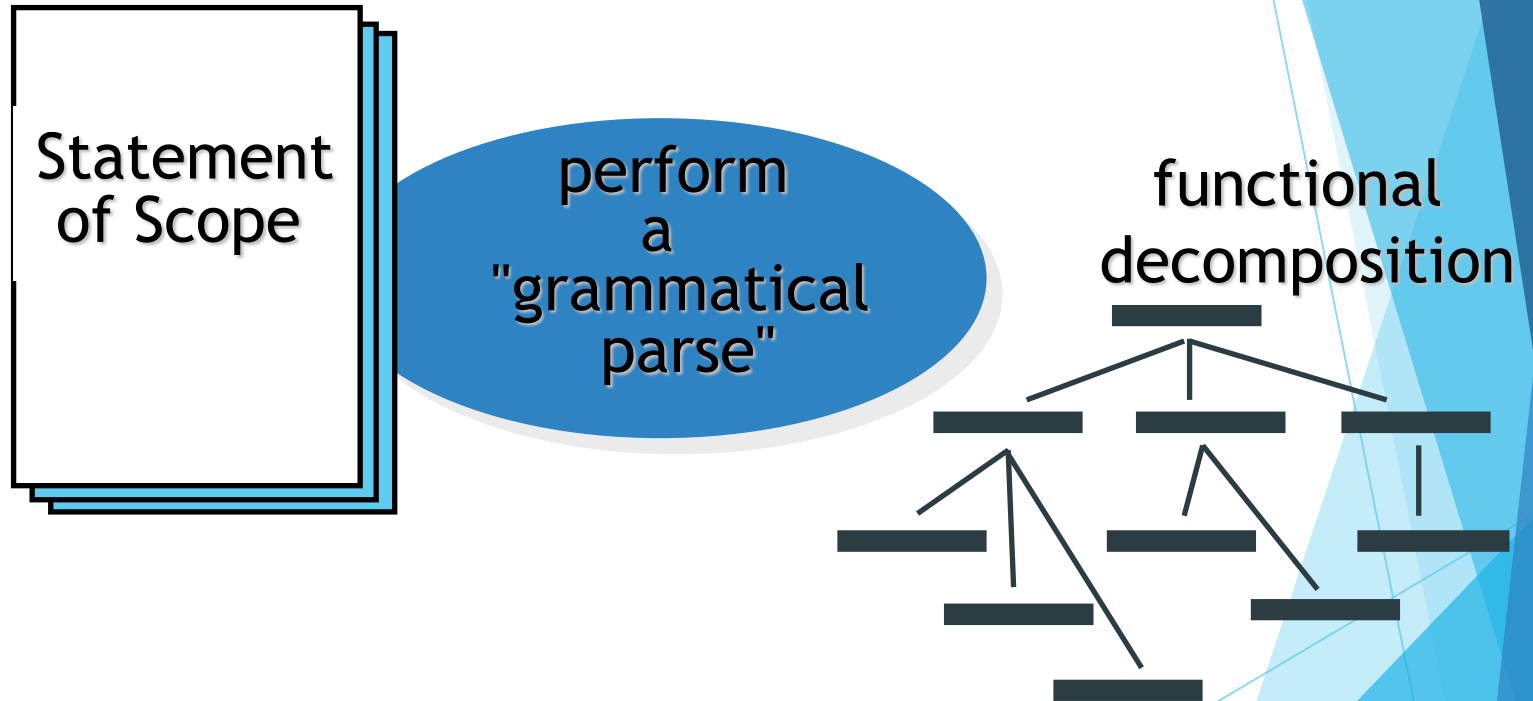
- project scope must be explicitly defined
- task and/or functional decomposition is necessary
- historical measures (metrics) are very helpful
- at least two different techniques should be used
- remember that uncertainty is inherent

Estimation Techniques

- ▶ past (similar) project experience
- ▶ conventional estimation techniques
 - ▶ task breakdown and effort estimates
 - ▶ size (e.g., FP) estimates
- ▶ tools



Functional Decomposition



Conventional Methods: LOC/FP Approach

- ▶ compute LOC/FP using estimates of information domain values
- ▶ use historical effort for the project

Example: LOC Approach

Functions	estimated LOC	LOC/pm	\$/LOC	Cost	Effort (months)
UICF	2340	315	14	32,000	7.4
2DGA	5380	220	20	107,000	24.4
3DGA	6800	220	20	136,000	30.9
DSM	3350	240	18	60,000	13.9
CGDF	4950	200	22	109,000	24.7
PCF	2140	140	28	60,000	15.2
DAM	8400	300	18	151,000	28.0
Totals	33,360			655,000	145.0

Example: FP Approach

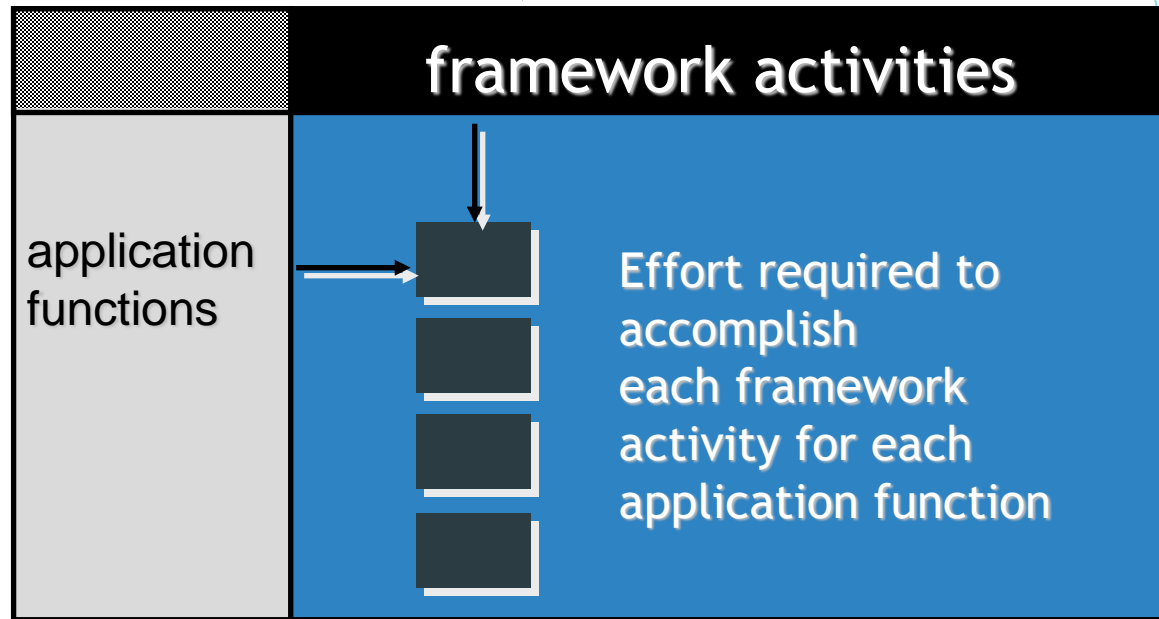
<u>measurement parameter</u>	<u>count</u>	<u>weight</u>			
number of user inputs	40	x	4	=	160
number of user outputs	25	x	5	=	125
number of user inquiries	12	x	4	=	48
number of files	4	x	7	=	28
number of ext.interfaces	4	x	7	=	28
algorithms	60	x	3	=	180
count-total					569
complexity multiplier					.84
feature points					478

×

$$0.25 \text{ p-m / FP} = 120 \text{ p-m}$$

Creating a Task Matrix

Obtained from “process framework”



Tool-Based Estimation

project characteristics



calibration factors

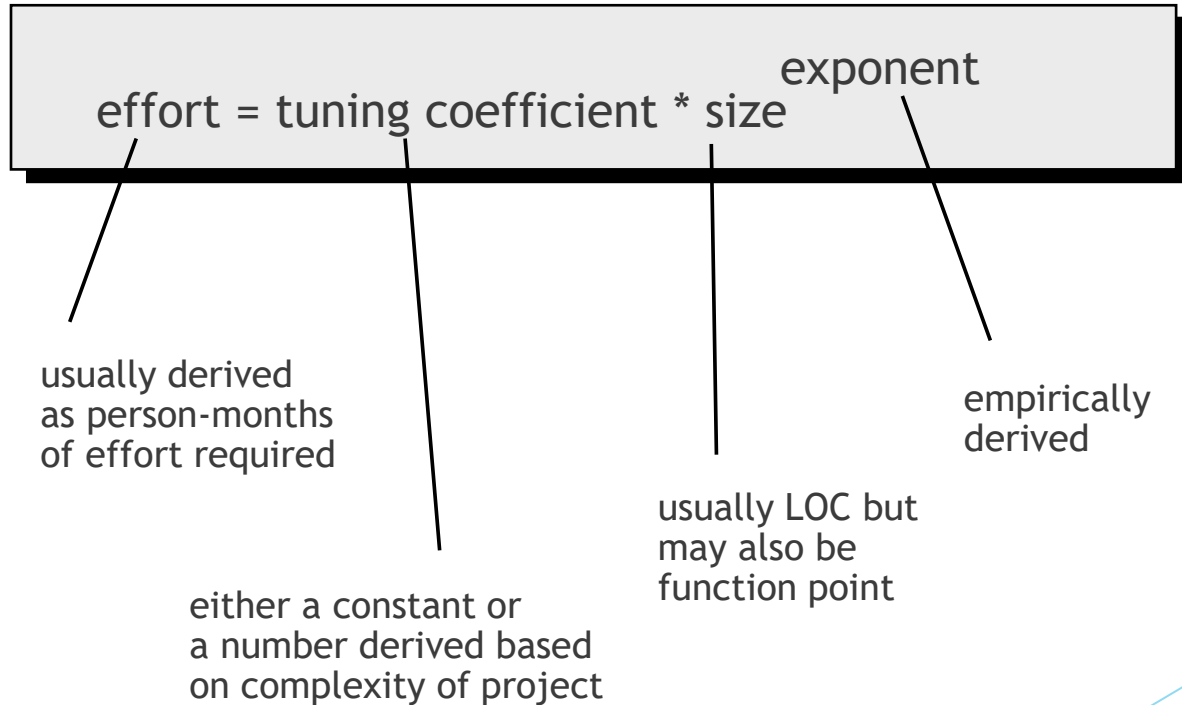


LOC/FP data



Empirical Estimation Models

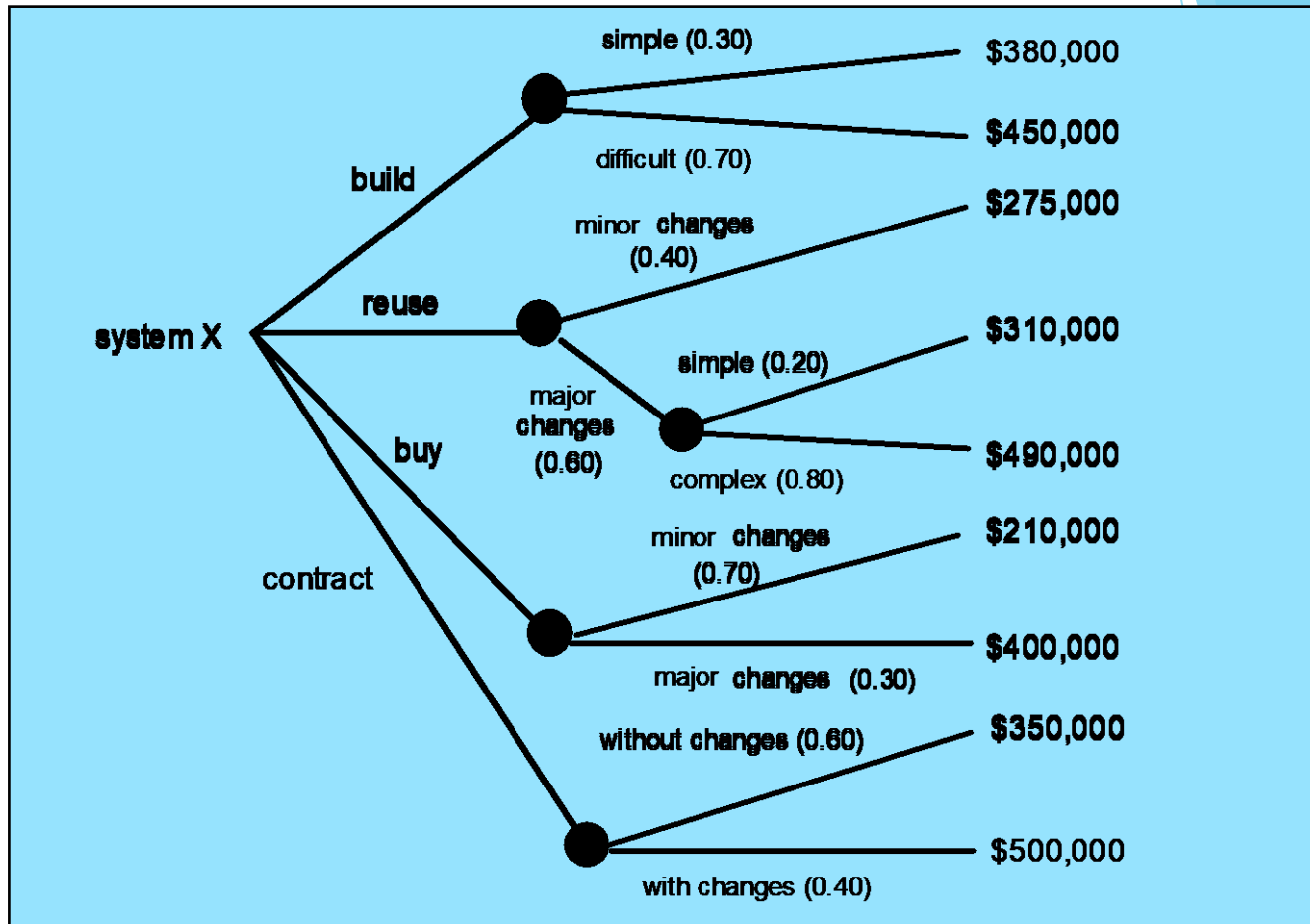
General form:



Estimation Guidelines

- estimate using at least two techniques
- get estimates from independent sources
- avoid over-optimism, assume difficulties
- you've arrived at an estimate, sleep on it
- adjust for the people who'll be doing the job—they have the highest impact

The Make-Buy Decision



Computing Expected Cost

expected cost =

$$\sum (\text{path probability})_i \times (\text{estimated path cost})_i$$

For example, the expected cost to build is:

$$\begin{aligned}\text{expected cost}_{\text{build}} &= 0.30(\$380\text{K}) + 0.70(\$450\text{K}) \\ &= \$429\text{ K}\end{aligned}$$

similarly,

$$\text{expected cost}_{\text{reuse}} = \$382\text{K}$$

$$\text{expected cost}_{\text{buy}} = \$267\text{K}$$

$$\text{expected cost}_{\text{contr}} = \$410\text{K}$$