Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

Universiteit Leiden

Planning, Estimation & Measurement

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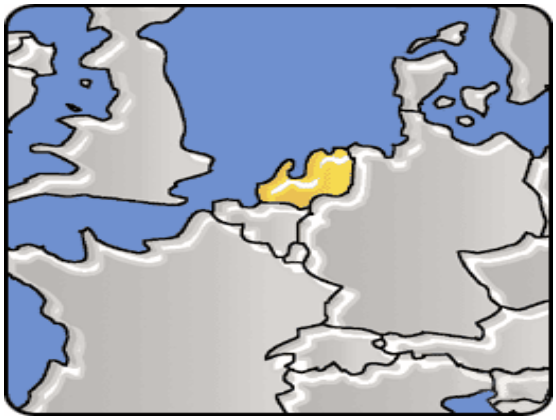
Capgemini

- 68.000 employees
- More than 30 countries
- Serve all possible markets
- Approach: Collaborate

- Study: Chemistry, Environmental sciences and Laboratory Informatics
- 12 years at Capgemini
- Roles: developer (pascal, C, C++), tester, process improver, project manger, recruiter, estimation & measurement officer

Capgemini Holland



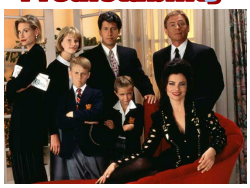
Appr. 6.000 employees

Accelerated Delivery Center

ADC Objective

Productivity

Predictability

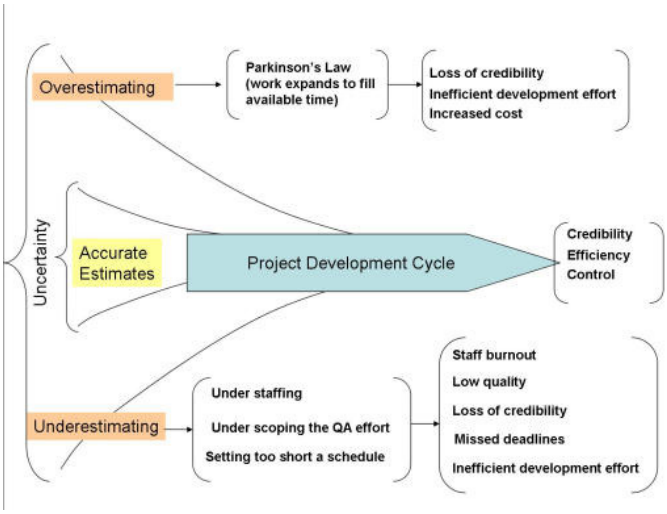


Project Risks

Development lead time

Transparency

Why do you want to estimate?



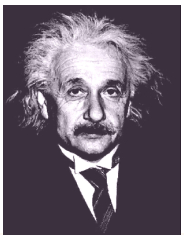
Estimation basics: ways to estimate?

Top down

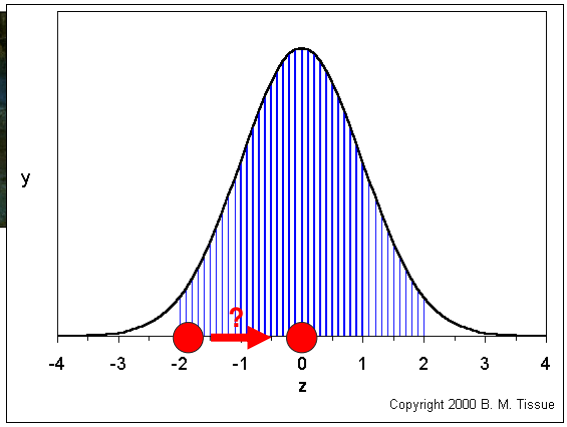
Bottom up

Analogy

Expert

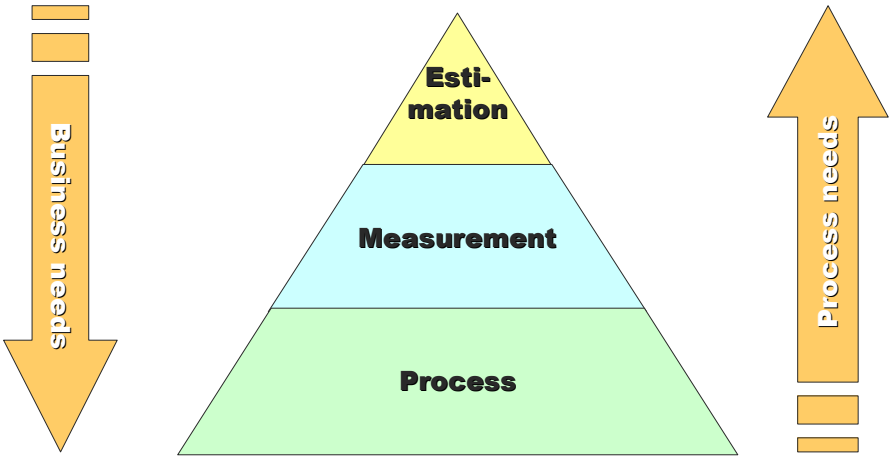


Estimation basics: Expert estimation

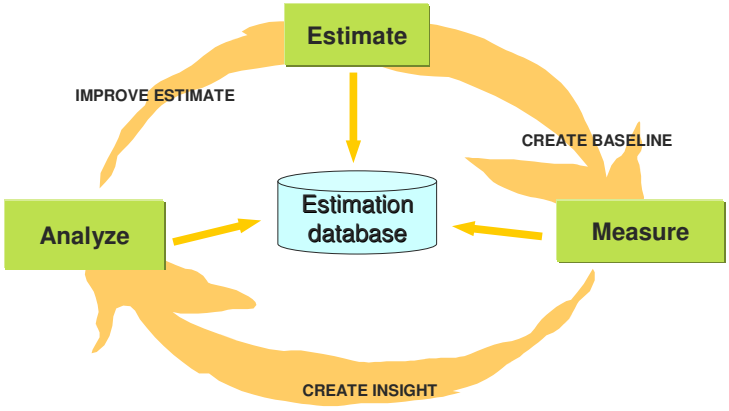


Improve expert estimation:
- Wide band delphi
- PERT

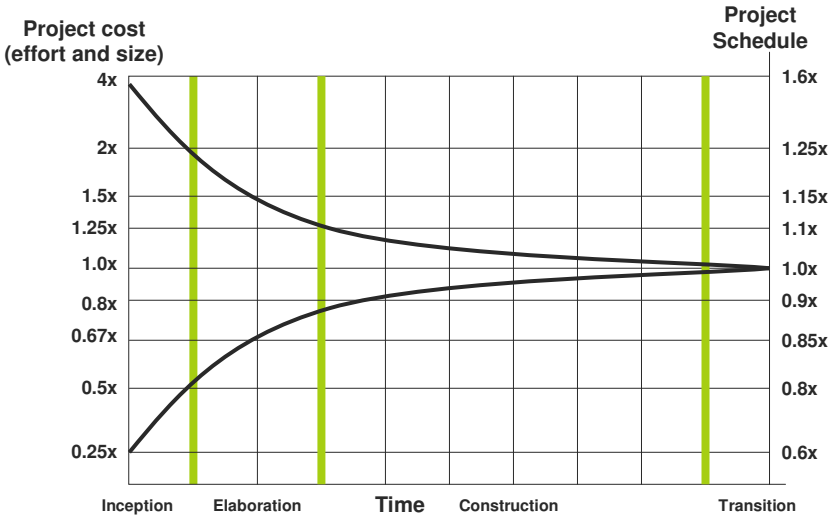
The basics of Estimation & Measurement



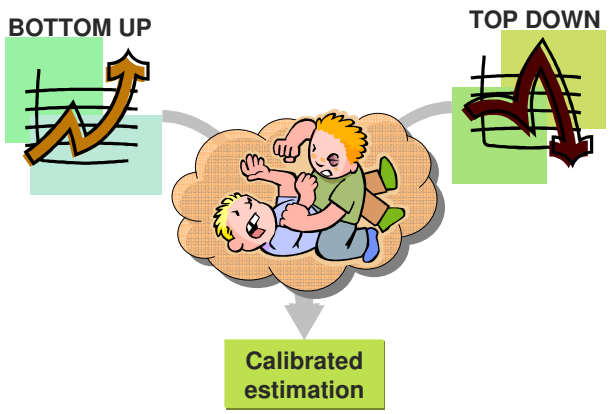
The E&M lifecycle



The cone of uncertainty



Estimating

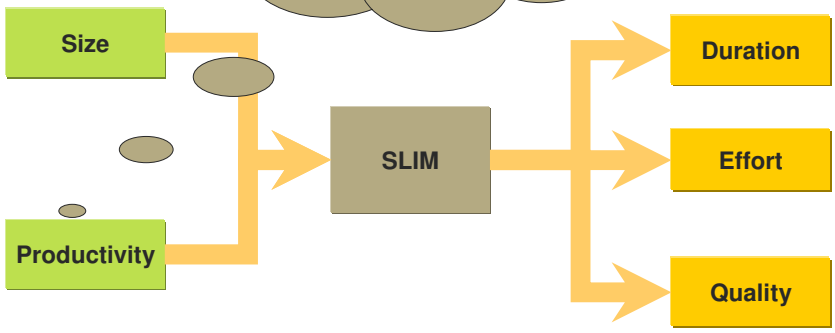


Top Down estimate

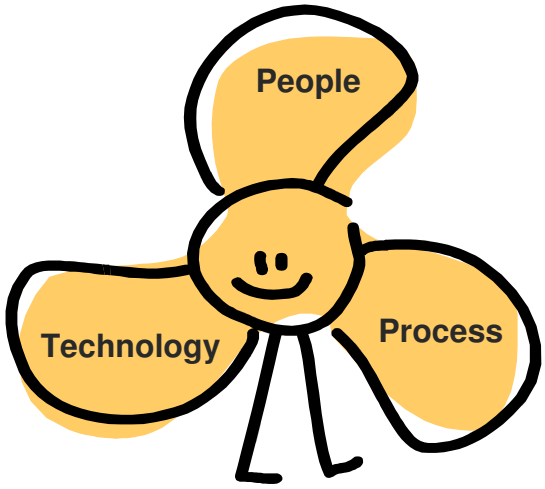
Traditional

Size x $PI = \frac{size}{[effort]^{1/3} \times [time]^{4/3}}$

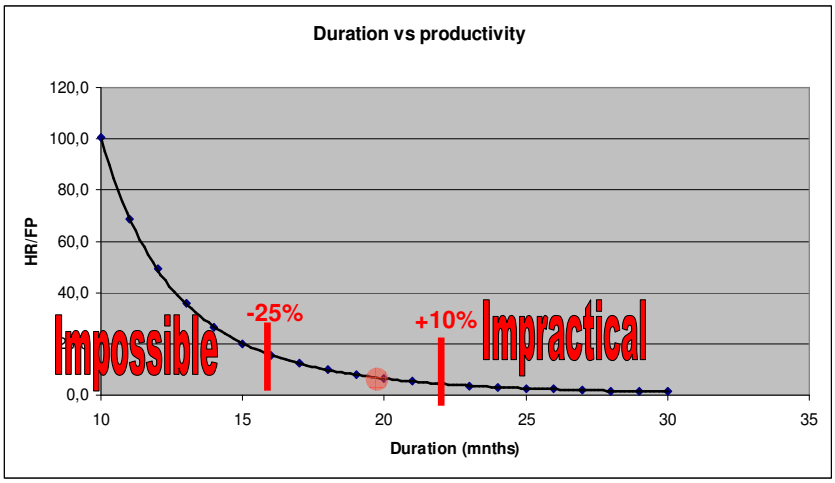
Capgemini / ADC



Productivity factors



Effect of duration on productivity



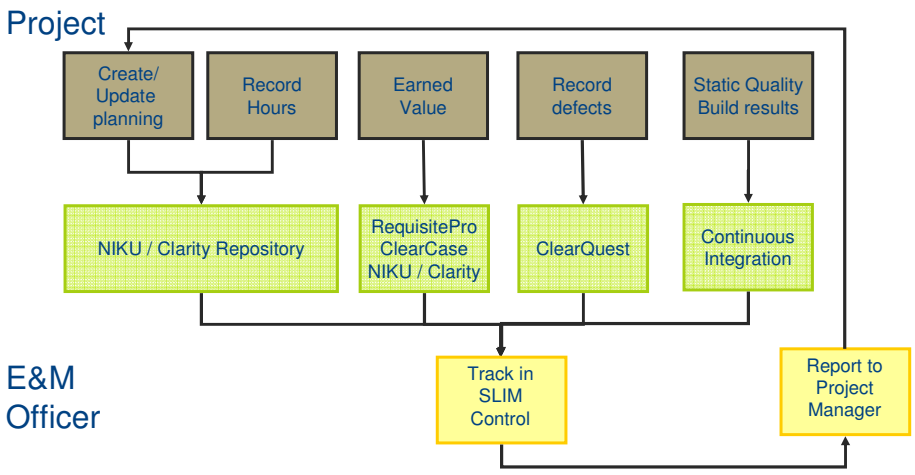
Effect of duration on productivity

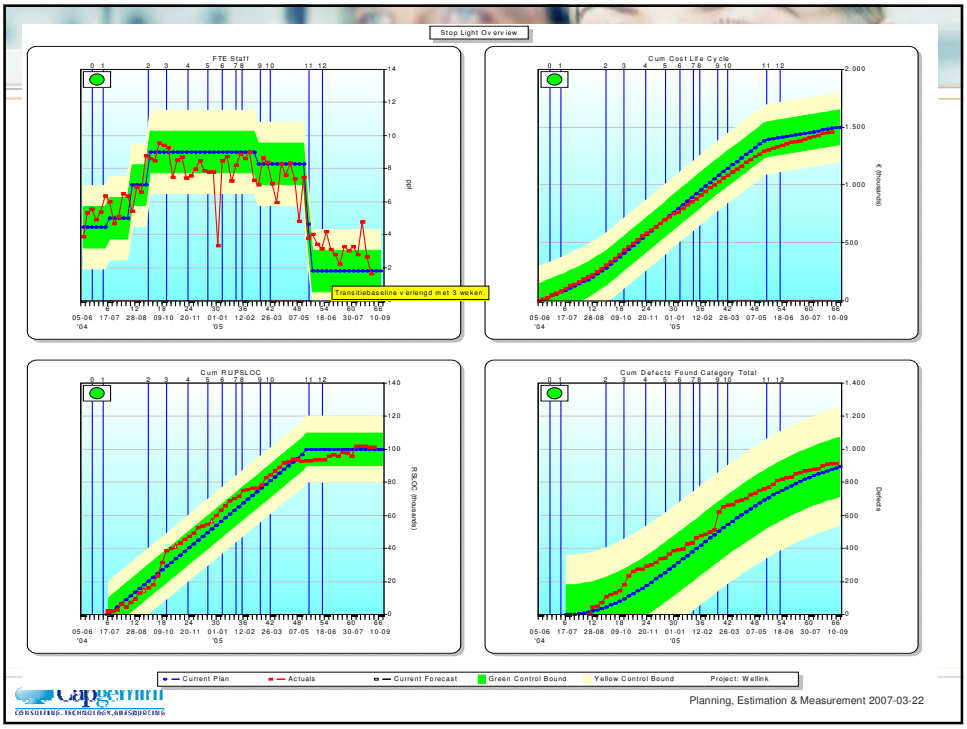
Duration [Mnths]	Effort [PHR]	Teamsize [FTE]	Efficiency [PHR/FP]
15	63630	24,5	20,1
16	49005	17,7	15,5
17	39010	13,3	12,3
18	30911	9,9	9,8
19	24524	7,5	7,7
19,9	20890	6,1	6,6
20	20736	6	6,5
21	16605	4,6	5,2
22	13904	3,7	4,4
23	11746	3	3,7
24	9887	2,4	3,1

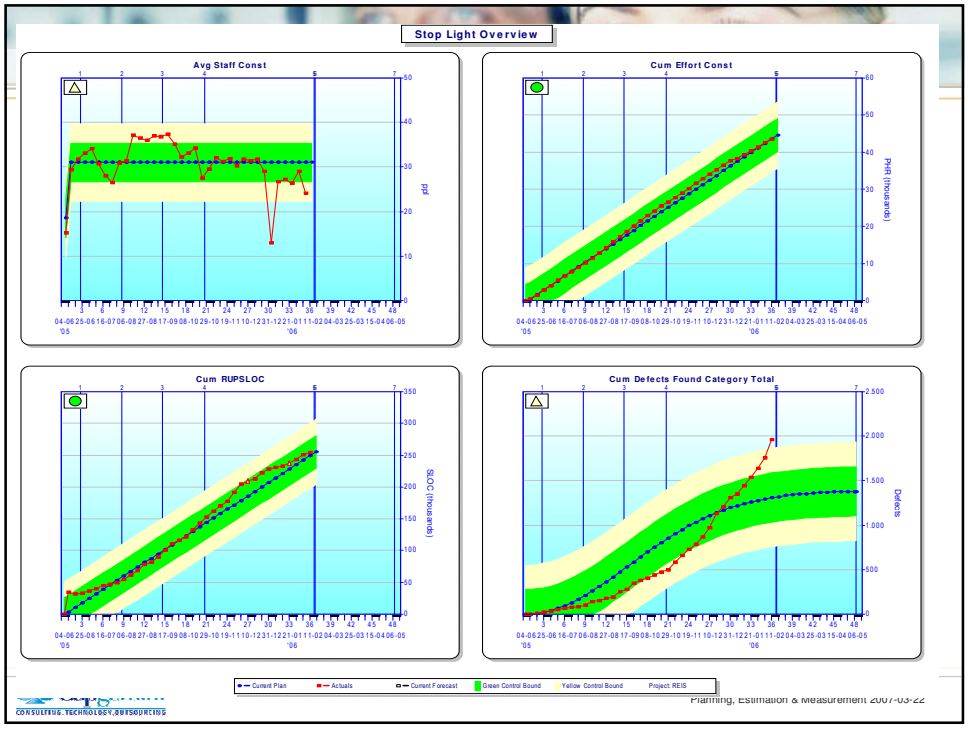
Constraints:
- 3200 FP
- PI 20,4

Optimal:
- Duration: 19,9 months
- -25% = 15,75 mnths
- +10%= 22 mnths

Measurement: Tracking actuals






Stop Light Overview
Avg Staff Const
pd
Cum Effort Const
PHR (thousands)
Cum RUPSLOC
SLOC (thousands)
Cum Defects Found Category Total
Defects
Current Plan
Actuals
Current Forecast
Green Control Bound
Yellow Control Bound
Project: REIS
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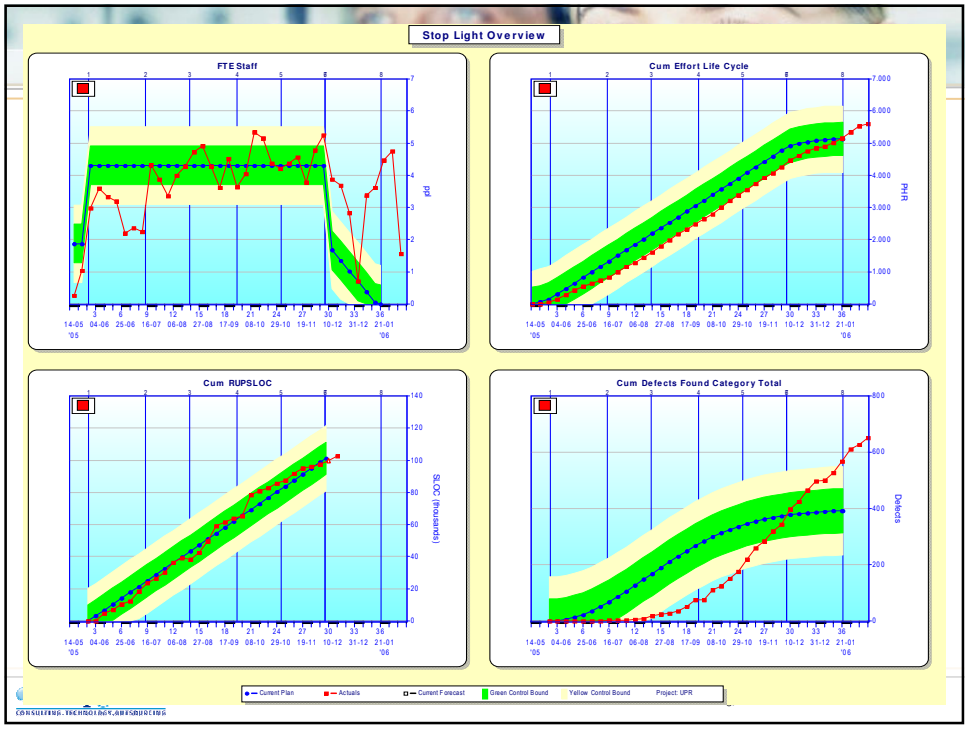
Stop Light Overview
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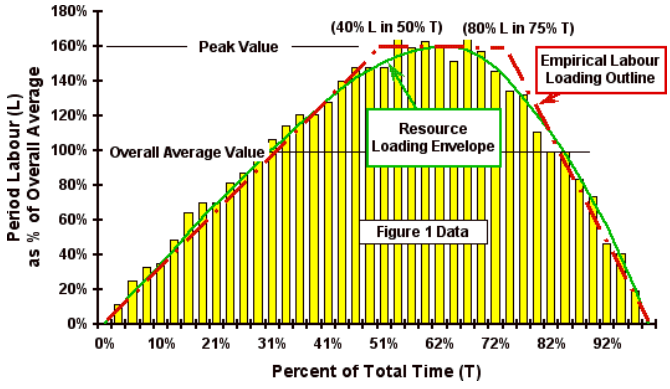
Project: UPR

Your questions

Manpower build-up (from Construction Industry!)



- Allen puts forward the following simple empirical relationship as a first approximation to planned manpower loading (Allen 1979).
- The maximum on-the-job manpower is 160% of the average manpower requirement.
- The maximum on-the-job manpower first occurs after 40% of the total manpower requirement has been expended.
- The period of maximum on-the-job manpower accounts for 40% of the total manpower requirement.
- The maximum on-the-job manpower first occurs when 50% of the project time has elapsed.
- The period of maximum on-the-job manpower occurs for 25% of the project time.

Allen, W. 1979. *Developing the Project Plan*. Notes prepared for Engineering Institute of Canada Annual Congress Workshop. Toronto. pp 3-9.

Canadian Journal of Civil Engineering, Vol. 21, 1994 pp 939-953, under the title "A Pragmatic Approach to Using Resource Loading, Production and Learning Curves on Construction Projects".

- A first approximation to project progress or output is suggested by the following empirical relationship.
- 25% of total progress is achieved in the first third of the total time,
- Another 50% in the next third, and
- The remaining 25% in the last third.

- Important parameter:
  - man-power build up rate: how fast are people added to the project