

Re-estimation: A Recovery Effort Model

(Chapter 13 – Software Project Estimation)

Alain Abran

(Tutorial Contribution: Dr. Monica Villavicencio)

Topics covered

1. Introduction
2. The Need for Re-estimation
3. The Recovery Effort model
4. The Recovery model when the re-estimation need is identified

13.1 Introduction

Re estimation for underestimated projects

How do you estimate this effort?

Is going back to the initial set of estimates sufficient?

How much additional effort is required?

Is using the contingency identified at the outset of the project still relevant and prudent?



<http://2012books.lardbucket.org/books/job-searching-in-six-steps/s12-04-different-types-of-questions.html>

13.2 The Need for Re-estimation

The need for re-estimation

When project:

- goes significantly off-track
- is greatly overshooting its budget
- will miss the deadline



Constraints & Decision choices

Choices =

1. Increasing the budget (e.g. re-estimating), while keeping the same deadline and the same set of functions.
2. Increasing the budget (e.g. re-estimating) to deliver the same number of functions, but postponing the deadline.
3. Staying within the budget, but postponing a number of functions to a later project phase.
4. Staying within the budget and deadline, but stopping testing early (i.e. skipping a number of quality controls).

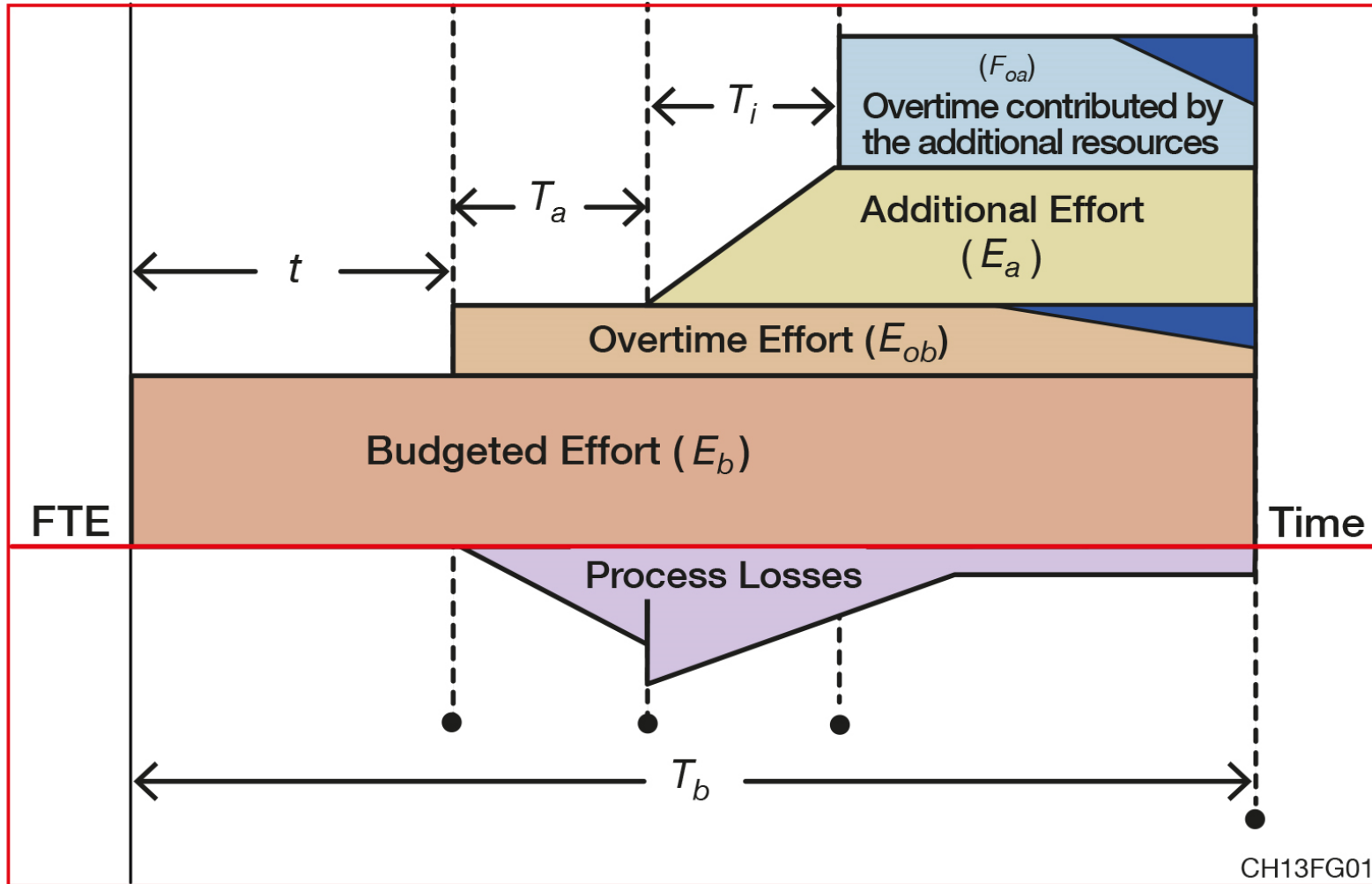
Schedule overrun

“When faced with a schedule overrun, management’s preferred course of action is not to revisit the plan to achieve the best economic outcome, but to attempt to keep to the schedule by adding staff, despite the fact that adding resources midway through a project will result in one or more of the following”

[Sim and Holt, 1998]

13.3 The Recovery Effort Model

Recovery cost of an underestimated project



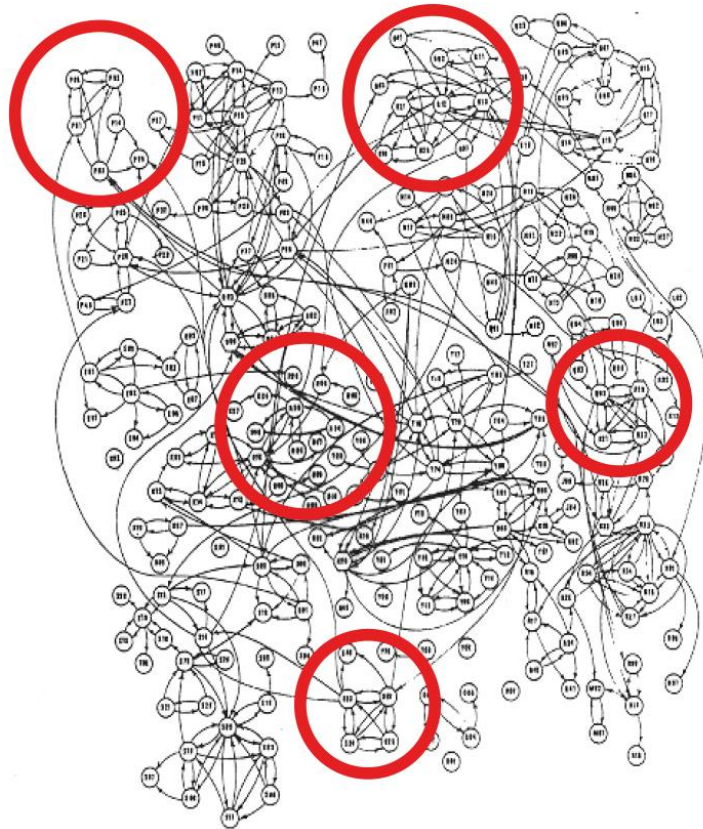
Ramp-up process losses

- Adding staff midway through a project creates additional work:
 - Ramp-up process losses.
 - leading to the incorporation of the newcomers and the effort expended by the original staff coaching them.

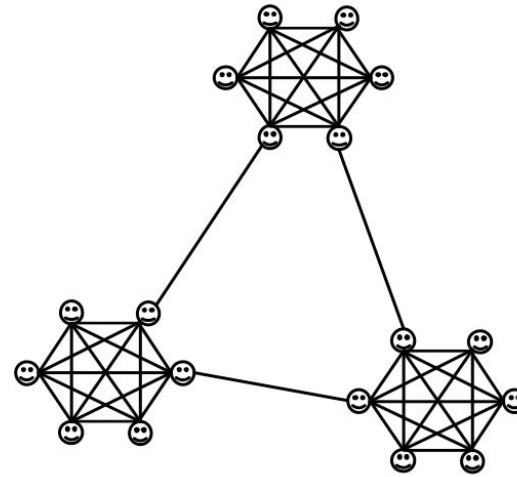


<https://www.linkedin.com/pulse/20141201144316-198638742-worst-reasons-for-adding-people-on-linkedin>

Communication in R&D teams



(a)



(b)

$$i = \frac{n(n-1)}{2N} + \frac{N(N-1)}{2}$$

(c)

CH13FG02

13.4 A Recovery Model

Recovery variables

- E_b : amount of effort originally allocated to the project
- T_b : time budgeted
- FTE_b : original staff
- t : time at which the underestimation is acknowledged
- T_a : mean time between the time the decision to bring in new staff was made and the time when the new staff arrive.
- E_a : additional effort
- E_{ob} E_{oa} : The overtime efforts
- P_i : The process losses (include all the extra effort: ramp-up, coaching, and communication overhead).

Probability of underestimation

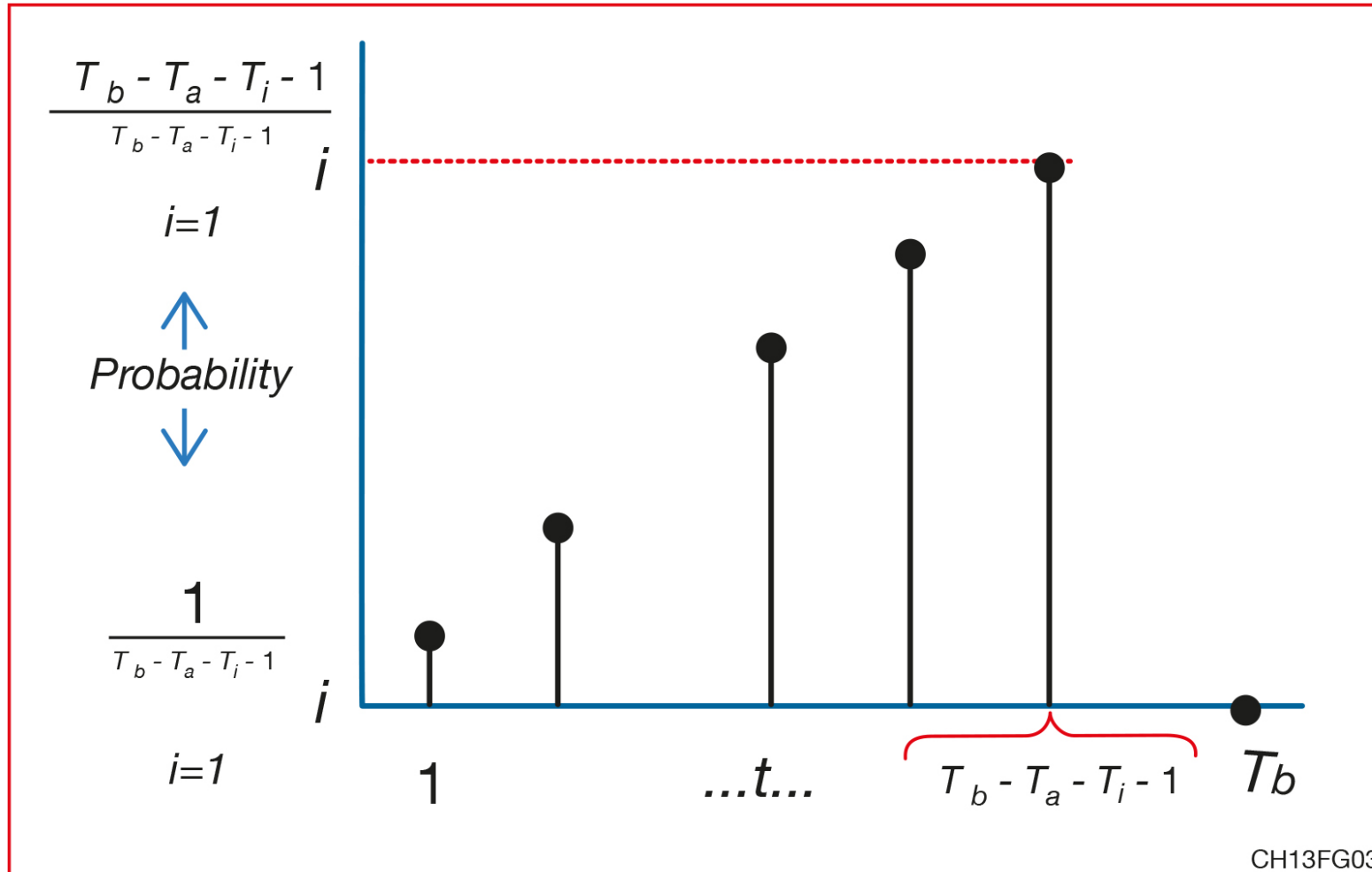
$$F(u) = \begin{cases} \text{if } u \leq u_{min} \text{ then} \\ 0 \\ \text{elseif } u_{min} < u \leq u_{ml} \text{ then} \\ \frac{(u - u_{min})^2}{(u_{max} - u_{min})(u_{ml} - u_{min})} \\ \text{elseif } u_{ml} < u < u_{max} \text{ then} \\ 1 - \frac{(u_{max} - u)^2}{(u_{max} - u_{min})(u_{max} - u_{ml})} \\ \text{elseif } u \geq u_{max} \text{ then} \\ 1 \\ \text{endif} \end{cases}$$

$u_{min} = \text{BestCaseEstimate} - \text{ProjectBudget}$

$u_{ml} = \text{MostLikelyEstimate} - \text{ProjectBudget}$

$u_{max} = \text{WorstCaseEstimate} - \text{ProjectBudget}$

Probability of acknowledging the underestimation



CH13FG03

Excercises

1. List 4 strategies which can be looked at when a project schedule and budget is seriously off-track.
2. When additional staff is added to a project, what are the positive & negative productivity impacts that you must take into account for re-estimation purposes?
3. Is there a penalty to having to re-estimate a project at some point? Is the impact on total effort the same across the whole life cycle?
4. What is the impact on delaying re-estimation when the schedule must stay fixed?
5. When re-estimating, where should the additional funding be coming from?

<https://www.linkedin.com/pulse/20141201144316-198638742-worst-reasons-for-adding-people-on-linkedin>

Term Assignments

1. Some say that adding new staff to a late project makes it even later! Comment, and discuss when this assertion is valid & when it is not.
2. Look back at your last 5 projects. Which ones had to be re-estimated? When in the life cycle were re-estimates performed? What were the consequences of re-estimation on the budget and schedule?
3. What was the basis for re-estimation? Does your organization have a specific re-estimation model?
4. Your project is significantly late, and, to finish on schedule, you will need to hire five new staff. How would you calculate the process loss resulting from hiring these individuals & getting them up to speed? Does your organization take such a loss into account when re-estimating projects?
5. How can you take schedule penalty costs into account when re-estimating a project?