EECE 443 : Software Project Management

Assignment #4 February 5th, 2013

Part 1: Estimation

Your team has successfully developed 8 systems in the last 2 years, all in the same domain: e-Commerce applications, using over the years 3 different programming languages+technology (noted A, B and C). You've collected some information about these 8 projects, as part of your attempts to do Function Point Analysis:

- # of inputs
- # of outputs
- # database entities accessed
- # of system users
- effort in person-days
- # of pages in the final users guide
- programming language & toolkit (A, B, or C)

Project	Inputs	Outputs	Entities	Users	Pages	Lang.	Effort
1	210	420	40	10	35	A	30
2	469	1406	125	20	10	A	85
3	513	1283	76	18	9	B	108
4	660	2310	88	200	75	B	161
5	183	367	35	10	5	C	22
6	244	975	65	25	32	C	42
7	1600	3200	237	25	12	B	308
8	582	874	111	5	3	C	62
X	*180*	*350*	*40*	*20*		*B ?*	*??*
Y	*484*	*1190*	*69*	*35*		*B ?*	*??*

You are now planning to develop two new projects, X and Y. From their current descriptions -- a requirement document-- you have derived some estimates of the number of input, output and data entities.

Your task is to estimate the effort for these 2 projects X and Y.

a) what are the parameters that seem to drive the productivity (= Function Point per person-day) in our team?

b) what is the productivity (in FP per person-day) for language A, B and C?

c) what would be the estimated effort for X and Y using a Function Point approach?

d) what would be the estimated effort for X and Y using just an analogy approach (similar project, or "close enough" project)?

e) Right now projects X and Y are planned to be done in language B? Should you change?

Notes:
1) An unadjusted Mark II function point (FP) count can be estimated by the formula

FP = 0.58 x (#of inputs) + 1.66 x (#of DB entities) + 0.26 x (#of output)

2) The Euclidean distance D between 2 projects u and v, for which you have a number n of significant parameters a, b, c, …n is:

$$D = \sqrt{(a_u - a_v)^2 + (b_u - b_v)^2 + ... + (n_u - n_v)^2}$$

Source: Hughes and Cotterrell 2003

Part 2: Scheduling

Your project consists of 8 major subprojects or tasks, for which you now have some estimates in person-days, and some dependencies. By *dependencies*, we mean that (in the table below) task T6 can only start after T3 and T4 are completed. Assume you cannot split tasks between individual developers (that is, have 2 persons or more working together on the same task).

Task #	Duration	Dependencies
T1	8 days	None
T2	4 d	None
T3	6 d	T4
T4	4 d	None
T5	10 d	T1, T6
T6	4 d	T3, T4
T7	6 d	T6
T8	2 d	T2

a) Identify the sequence of tasks that constitutes the *critical path*. Suggestion: Draw a project activity network (i.e., a directed graph with tasks on the arcs) for this project.

b) What is the minimal time required to complete this project?

c) How much “slack” does task T1 have? (in other words: How late can it be started or delayed during execution without affecting the final delivery date?)

d) How many people at minimum do you need to complete the project in the minimum time you gave in (b). Show one possible task allocation.

e) The developer of task T7 reports one morning that it will take her twice the expected time to complete: 12 days instead of 6. How does this affect the critical path, and what is the new time to complete the project?

Submit you assignment in PDF via Vista by Tuesday February 7th at 1:00pm *and* place a printed copy in the mailbox located in McLeod 4th floor, between rooms MCLD422 and 426. This is an individual assignment.