Illustrating the Use of the Model

Part 1: Model Narrative

Type of Project

The project I will be estimating is an application called Pic Fit. To get a general understanding of the COCOMO Calculation I researched examples on how it worked [1]. This mobile application helps users pick out an outfit with clothes and accessories from their physical closet. A virtual closet is created for the user after they scan their clothing and accessories into the application. The application will be able to identify the type of clothing without user input using an IoT clothing database. Setting preferences are available for modification for the user. If these settings are default, Pic Fit will create an outfit based on the current trending fashion. Outfit options are generated based on the clothes available in the virtual closet. If the user does not like the generated outfit, they can modify it within the application until satisfied. Once the user is happy, they can build the ensemble in real life.

Mode and Size

Pic Fit will use a complex algorithm to suggest outfit options for the user. This project will require a highly experienced team to develop the outfit algorithm and external expertise on current trending fashion. Given the complexity of the criteria necessary for this application, I selected the embedded mode for the project mode.

Given the complexity and the functionality of the mobile application, I estimated the size of Pic Fit to be 150,000 lines of code.

Project Factors

One factor influencing product attributes is the access to the clothing database to determine the type of clothing the user is scanning with the application. Accessing the database causes the size of the database required by the application to be extra high. The algorithm used to generate outfits must be optimal enough for fast response times. This factor influences the computer turnaround time to be low and the execution time constraint to be on the higher end. As stated previously, utilizing a highly experienced team is necessary for the project and causes the personnel attributes to be extra high. With a highly experienced team, the project attributes are also set on the higher end.

Estimation Report

COCOMO RESULTS for Pic Fit								
MODE	"A" variable	"B" variable	"C" variable	"D" variable	KLOC	EFFORT, (in person-months)	DURATION, (in months)	STAFFING, (recommended)
embedded	2.7153574504691798	1.2	2.5	0.32	150.000	1109.524	23.571	47.071
Explanation:	The coefficients are set accor	ding to the project n	node selected on the	previous page, (as p	er Boehm). No	ote: the decimal separator is a period.	Л	,
The final estimates are determined in the following manner:								
effort = a*KLOC ^b , in person-months, with KLOC = lines of code, (in thousands), and:								
staffing = effort/duration								
where a has been adjusted by the factors:								
Required Relia	Product Attributes	1.40 (VH)						
Database Size Product Compl		1.16 (XH) 1.30 (VH)						
Product Compi	Computer Attributes	1.50 (VII)						
Execution Time Main Storage (1.11 (H) 1.56 (XH)						
Platform Volati	ility	1.00 (N)						
Computer Turn	Personnel Attributes	0.87 (L)		SWL03 1	Applie	cationName:Pic Fit		
Analyst Capab Applications E		0.71 (VH) 0.82 (VH)				cationVersion:any		
Programmer C	apability	0.70 (VH)				cationNumber:STRS	S-SUB-	
Platform Exper Programming I	gramming Language and Tool Experience 0.95 (H)			SWL25_COCOMO_KLOC:150.000				
Modern Progra	Project Attributes amming Practices	0.82 (VH)		SWL25_1	_Appli	cationSLOC:150000)	
Use of Softwar	re Tools	0.83 (XH)				IO_mode:embedded		
	elopment Schedule r (Values are probably wron	1.00 (N) g)				IO_a:2.7153574504	691798	
Required reusa	ability n match to life-cycle needs	1.00 (N) 1.00 (N)		SWL25_C				
Personnel cont	tinuity	1.00 (N)		SWL25_C		The Control of the Co		
Multisite devel	lopment	1.00 (N)		SWL25_C		William - The state of the stat	47 45	
			SWL25_COCOMO_e_effort:1109.524 (person-months) SWL25_2_ApplicationLevelOfEffort:1109.524 (person-months)					
				SWL25_Z_ApplicationLevelOIEHort:1109.324 (person-months) SWL25_COCOMO_t_duration:23.571 (months)				
				SWL25_2_ApplicationTime:23.571 (months)				
Displayed on this page are the				SWL25_COCOMO_eot_staff:47.071 (recommended) SWL25_COCOMO_Required Reliability:1.40 (VH)				
Displayed on this page are the				SWL25_COCOMO_Database Size:1.16 (XH)				
estimation results for Pic Fit.				SWL25_COCOMO_Product Complexity:1.30 (VH) SWL25_COCOMO_Execution Time Constraint:1.11 (H)				
				SWL25_COCOMO_Platform Volatility:1.00 (N)				
				SWL25_COCOMO_Computer Turnaround Time: 0.87 (L)				
				SWL25_COCOMO_Analyst Capability:0.71 (VH)				
				SWL25_COCOMO_Applications Experience: 0.82 (VH)				
				SWL25_COCOMO_Programmer Capability:0.70 (VH)				
				SWL25_COCOMO_Platform Experience:0.90 (H) SWL25_COCOMO_Programming Language and Tool Experience:0.95 (H)				
				SWL25_C	OCON	IO_Programming La	anguage and Iool E	experience:0.95 (H)
						IO_Modern Progran IO_Use of Software		SZ (VH)
						IO_0se of Software IO Required Develo		00 (N.)
						O_Required reusab		.00 (11)
						IO Documentation		needs:1 00 (N)
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				CONTRACTOR CONTRACTOR CONTRACTOR		tadata:COCOMO	· · · · · · · · · · · · · · · · · · ·	
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				Suggest_F	ile_Na	me:2022-04-11_233	706_Pic_Fit-COCC	OMO-1.txt
						Page:Feb 6, 2015 10		
				subject:ST	RS CO	COMO Calculation		

Part 2: Worst Case Scenario

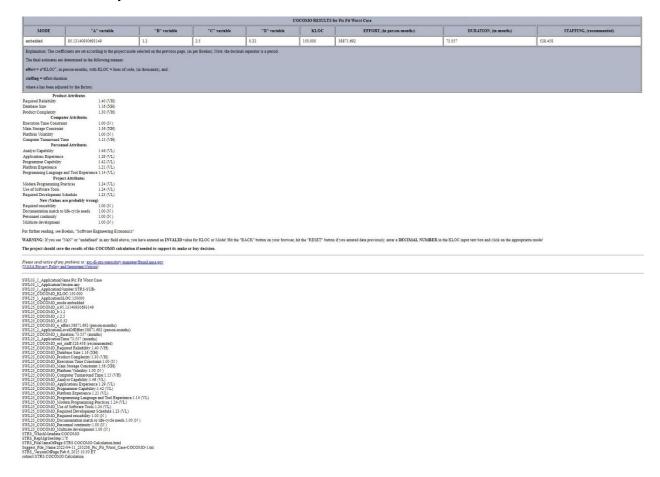
Cost Drivers Adjustments

To create a worst-case scenario with the same size and project mode, I input product attributes the same as the original estimation from part 1 since the project's scope would not change. The only computer attribute that changed for this case was computer turnaround time. Slow computer response time impacts the developer's ability to develop and maintain the project time-wise. As stated in part one, Pic Fit ideally requires an experienced team to develop the project due to its complex factors. For this part, personnel attributes were each inputted as very

low. Hiring an inexperienced team impacts the duration of time and effort needed to complete a complex project. Not having access to or lacking technology helpful in development hinders a team's ability to produce a complex application. All the attributes described in this section are displayed in the image to the right.



Estimation Report

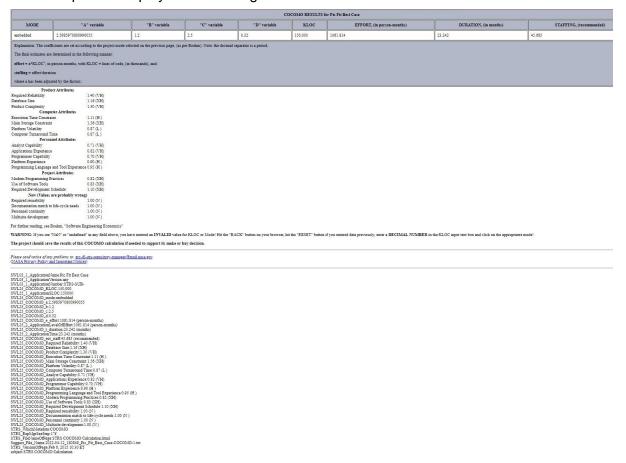


Using the same size and project mode for the estimation resulted in several differences between the original estimation and this one, the worst-case scenario. The "A" variable changed from 2.715 to 95.131 and was the only letter variable that experienced a change. Variable B, C, and D stayed the same in both estimations. Efforts for in-person months experienced an increase of 37,762.168 months. This increase was caused by hiring an inexperienced team and the lack of technology available. The worst-case estimation of Pic Fit involved setting all the personnel and project attributes to be very low. The duration was also increased by about fifty months due to these attributes. The last difference within this estimation was the staffing required to complete the project. The staffing for the project juristically increased from about 47 people to about 528 people.

Part 3: Ideal Conditions Scenario

Cost Drivers Adjustments

To create a best-case scenario, 150,000 KLOC was input for size and used an embedded project mode. Personnel attributes were inputted the same as the original estimation from part 1 since the project's scope still would not change. Under product attributes, only platform volatility was modified and set to low from nominal. The original estimation for Pic Fit included an experienced team and the use of higher technology. Therefore, this best-case scenario's results were similar to those from part one. Project attributes were each input as extra high to create an ideal minimal time and effort scenario. Overall, the attributes and results for part 3 were very similar to part 1. Displayed in the image below are all the attributes described in this section.



Estimation Report

Using the same project mode and the project size, the estimate for a best-case scenario was very similar to the first estimation displayed in part one. The "A" variable experienced a decrease of about 0.12, while the B, C, and D variables stayed the same. Efforts for the in person-months decreased from 1109.524 to 1061.814 in this estimation. Modifying the required development time under project attributes from nominal to extra high duration was impacted. This value resulted in a decrease from 23.571 to 23.242 months. The staffing for this project also experienced a minor reduction of 47.071 to 45.685 people.

References

 Tomar, N. COCOMO 1/ COCOMO'81: Constructive Cost Estimation Model. *C-sharpcorner.com*, 2012. https://www.c-sharpcorner.com/uploadfile/nipuntomar/cocomo-1-cocomo81-constructive-cost-estimation-model/.