

Delphi Technique for software estimation

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Delphi is a place in Greece, which was supposed to confer predictive powers to the person. A temple was built there and virgin girls were appointed there to answer questions about the future – these were called Oracles. Oracle's prophecies were considered prophetic or at least wise counsel. This technique, taking cue from the above legend, is drawing wise counsel (Oracle) from senior and experienced software developers for preparing estimates for software development projects.

Under this method of software estimation, the project specifications would be given to a few experts and their opinion taken. The actual number of experts chosen would depend on their availability. A minimum of three is normally selected to have a range of values.

Now this method has the following steps –

1. Selection of experts
2. Briefing to the experts
3. Collation of estimates from experts
4. Convergence of estimates and finalization

Selection of experts

Now the experts are selected who have these attributes, namely,

1. They have software development experience
2. They have worked and possess knowledge in the application domain at hand
3. They may be from within the organization or from without the organization

It is necessary to select at least three experts so that there is a range. The actual number of experts selected can depend on the –

1. Complexity of the project – more complex more experts
2. Availability of experts who have the domain knowledge
3. The competition and the necessity of winning over competition – if we perceive stiff competition and expecting the margins to be low, we need to get more expert advice

Briefing the experts

The experts need to be briefed about the project. This may happen independently or in a meeting. The following aspects need to be briefed –

1. Objectives of the estimation
2. Explanation of the project scope
3. Competition and its nature in the project bidding
4. Timelines for completing the estimate and deliverables expected from the experts
5. Any clarifications asked by the experts



Now the experts would be ready for coming out with the estimates. How much time should we allow experts to come out with estimates? It depends on the requirements of the project and the willingness of the experts. I would advocate a minimum of one calendar so that the experts do have time to mull over the project and come out with estimates.

Collation of estimates received from the experts

The experts are expected only to give just to give one figure for software development effort and optionally software size. This is their best guess or hunch.

Each of these Oracles (experts) would give their opinion. Then these opinions were tabulated as shown in the below table.

Name of Expert	Size	Effort
Expert 1	A	X
Expert 2	B	Y
Expert 3	C	Z
Expert n	K	L

Convergence of estimates and finalization

Once we collate the estimates, we can decide how to converge these estimates. Now the convergence is achieved in two ways –

1. An average is derived using either the arithmetical average or statistical Mode from the opinions offered by the experts
2. The extreme estimates (the highest figure estimate and the lowest figure estimate) are interchanged – that is –
 - a. The highest estimate is given to the expert who gave the lowest figure estimate
 - b. The lowest estimate is given to the expert who gave the highest figure estimate
3. They are requested to review the estimate and give their opinion on it and if necessary to revise their original estimate
4. This may bring about convergence between the extremes. The an average estimate can be derived using either the arithmetical average or statistical Mode from the opinions offered by the experts

Now this estimate (after achieving the convergence or deriving the average) would be made use of for our purposes.

A sample Delphi estimation Sheet is appended to this book in Appendixes. You may use it as it is or modify it to suit your organization or may develop a new template to suit your specific needs and process.

Merits of Delphi technique

1. Very useful when the organization does not have any in-house experts with the domain knowledge or the development platform experience to come out with a quick estimate
2. Very quick to derive an estimate
3. Simple to administer and use



2. Maintenance
3. Reengineering
4. Conversion
5. Software Implementation (ERP, SCM etc)
6. Others (specify)

5. Estimation Inputs (list of documents supplied along with this note):

1. Request for Proposal
2. Briefing by Marketing
3. Direct briefing form the Client
4. User Requirements
5. Statement of Work
6. Software Requirements Specification
7. Design Document
8. Email from marketing
9. Inputs provided by the Bidding Process (Applicable for projects initiated by Marketing)
10. Other (Specify)

7. Experts Selected

Name of Expert	Domain Expertise		Development Platform Expertise	
	Expertise Description	Number of years	Expertise Description	Number of years
Expert 1				
Expert 2				
Expert 3				
Expert 4				

8. Estimate Convergence

Use a separate table for each iteration of convergence.

Name of Expert	Size	Effort
Expert 1	A	X
Expert 2	B	Y
Expert 3	C	Z
Expert n	K	L

Convergence average Method – Arithmetical Average / Statistical Mode (strike off the one not applicable)

Finale Convergence

Software Size & size measure –

Software development Effort in Person Hours -

To be filled in by PMO (Project Management Office)

1. Actual Software Size

