Van Lang University

**Software Measurement and Analysis course**

**Viking Project Estimation**

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**Author:** K14T01 – Team 01

**Team member:**

Duong Nguyen

Mung Nguyen

Manh Nguyen

Binh Huynh

Hien Nguyen

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7. **INTRODUCTION:**

After building vision and scope as well as URD based on the traditional method, project team starts to create WBS and estimate cost and time due to collected data. And then this document is to specify the method to estimates in schedule and budget of software development for the Viking Projects.

Through this document we will generate schedule, budget and resource estimates for the Viking project.

1. **OVERVIEW WIDE BAND DELPHI:**
   1. WBD Strengths

* It is a simple technique not requiring estimation experts
* Applicable to original projects where no previous metrics exist
* The process is an inclusive approach using all the project team to perform an active role in estimation
* Estimation figures are produced by team consensus through estimation iteration sessions. More likely to mitigate impact of large individual errors
* An expert judgment driven technique using developers to estimate. They are most likely to understand technical complexity and challenges when considering the requirements in context
  1. WBD Weaknesses
* Difficult to repeat with different group of experts.
* Can develop a false sense of confidence.
* May fail to reach a consensus.
* Experts may be biased in the same subjective direction.
* Possible to reach consensus on an incorrect estimate, people may not be skeptical enough.

Viking project was built by traditional method, with evaluate and analysis about method to estimate. We sure that Wide band Delphi is method suitable for Viking’s Project. So, we decision that Team estimator will apply method Wide band Delphi to estimate.

1. **WIDE BAND DELPHI ESTIMATION RULES & ROLE:**
2. **Rule :**

* All estimation sessions must be performed individually with no pair or group interaction.
  + This is important to ensure that individual bias does not skew results
  + Also individual estimation is likely to reveal a wider number of activities that need to be taken into consideration
* Estimators must ignore external influencing factors – i.e. perceived expectation of a ‘suitable’ project estimate
  + The aim is to achieve consensus amongst the team on a realistic figure rather than provide one that the project sponsor wants to hear.
* Estimators must indicate factors affecting their figures.
  + This can help build a clearer picture of the task list
* Estimators will ignore holidays and other similar factors
* Ignore unnecessary complexity during the estimation process. Apply these factors when defining the actual project timescale estimation.
* Anonymity must be observed during the whole estimation process.
* It is essential that the facilitator ensures bias does not creep into the process.
* Estimators must not reveal which figures they derived
* Estimation sessions ideally have a predefined time limit.
* Don’t worry about getting it wrong (its an estimate anyway) and figures can be refined during successive iterations.
* Helps to maintain focus, continuity and progress
* The moderator must set the places where the team might be over or underestimating the effort for that task.
* Specific estimate times are *not* discussed in estimation session.

1. **Role & Criteria:**

|  |  |
| --- | --- |
| **Role** | **Criteria** |
| Moderator | * Moderator should be familiar with the Delphi process, but should not have a stake in the outcome of the session * PM should avoid Moderator role - should be part of estimation team |
| Members | * TMs must be willing to estimate each task honestly, and should be comfortable working with rest of the team. * Should be knowledgeable about organization’s needs and past engineering projects to make educated estimates. * Team should include representatives from each areas of development team: managers, designers, architects, Quality Assurant, analysts, technical writers, etc. |
| Observers | * One or more observers - selected stakeholders, users, and managers should be encouraged to attend the meeting |

1. **WIDE BAND DELPHI ESTIMATION PROCESS:**

*This is Wide Band Delphi process and step to implement it*

Planning and kickoff meeting

Re-Estimate using new information

Individual Preparation

Estimation Meeting

Assemble Estimation and Document Assumptions

Review Results

**No**

**Yes**

Done

1. **Team Selection:** Project Manager selects a moderator & an estimation team with 3 to 7 members.

* **Inputs:**
* Information about project
* **Outputs:**
* List Member of team estimation
* Plan for estimation process

1. **Kick-off Meeting:** The first meeting during which estimation team creates a WBS and discusses assumptions.

* **Inputs:** 
  + Vision & Scope document
* **Outputs:** 
  + List consisting of 10-20 major tasks
  + List consisting of assumptions
  + Task & Assumption Form.xls
* **Steps:**
  + Moderator presents the plan for estimating
  + Moderator explains the Wideband Delphi method:
    - Wideband Delphi Process
    - Estimation Rules
  + Moderator read and review the vision and scope document and supporting documentation with team (half-hour to hour).
  + The moderator reviews the goal of the estimation session with the team, and checks that each team member is sufficiently knowledgeable to contribute.
  + The team discusses the product being developed and brainstorms any assumptions.
  + The team generates a task list consisting of 10–20 major tasks.
  + The team agrees on the units of estimation (days, weeks, pages, etc.).
  + Moderator fills up task list and assumption into *Tasks & Assumptions Form.xls and* distributes it to the team members.

1. **Individual preparation:** After the first meeting, each team member creates an effort estimate for each task.

* **Inputs:**
  + List consisting of 10-20 major tasks
  + List consisting of assumptions
  + Task & Assumption Form.xls
* **Outputs:**
  + Individual preparation results
  + Individual Estimate Form.xls
* **Steps:**
  + Each team member independently generates a set of preparation results based provided input and estimation rules:
    - A document which contains an estimate for each of the tasks
    - The assumptions that the team member made in order to create the estimates
    - Or the additional tasks that the team missed during the kickoff meeting
  + Team member fills up individual preparation results into *Individual Estimate Form.xls*

1. **Estimation session:** The second meeting in which the team revises the estimates as a group and achieves consensus.

* **Inputs:**
  + Individual Estimation Form.xls
* **Outputs:**
  + Estimation Meeting Form.xls of each member
* **Steps:**
  + Moderator presents the estimation rules again
  + The moderator collects all of the estimate forms. The estimates are tabulated on a whiteboard by plotting the totals on a line. The forms are returned to the estimators.
  + Each estimator reads out clarifications and changes to the task list written on the estimation form. Any new or changed tasks, discovered assumptions, or questions are raised.
  + The team resolves any issues or disagreements that are brought up. When an issue is resolved, team members should write clarifications and changes to the task list on their estimation forms.
  + The estimators all revise their individual estimates by filling in the next “Delta” column on their *Estimation Meeting Form.xls*.

1. **Assemble tasks:** After the estimation session, the project manager summarizes results and reviews them with team.

* **Inputs:**
  + Estimation Meeting Form.xls of each member
* **Outputs:**
  + Assemble Tasks.xls
* **Steps:**
  + The project manager works with the moderator to gather all of the results from the individual preparation and the estimation session.
  + The project manager removes redundancies and resolves remaining estimate differences to generate a final task list, with effort estimates attached to each task. The assumptions are then summarized and added to the list.
  + The project manager creates *Assemble Tasks Form*
  + The project manager creates *Assemble Tasks.xls* that lists the final estimates that each person came up with. The file indicates the best-case and worst-case scenarios.

1. **Review results:** Review the results that have come out from the Estimation session
2. **EFFORT AND COST ESTIMATES:**

In the process estimating the costs and resources for Viking project, the WideBand Delphi approach is used by my team.

* + 1. – 5 days is the places where the team might be over or underestimating the effort for that tasks.

1. **Effort Estimates:** The following diagram provides a high level view of the effort estimates with confidence is 80%. A detailed effort estimate is presented in the *Assemble Tasks.xls*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ID | Tasks Name | Best | Most Likely | Pessimistic | Effort Estimate (Confidence = 80%) |
| 1 | Inception | 12 days | 16.5 days | 20 days | 17.453 days |
| 2 | Elaboration | 15 | 24.5 | 31 | 26.24 |
| 3 | Construction | 99 | 116.5 | 136 | 122.01 |
| 4 | Transition | 22 | 29 | 32 | 29.73 |
| 5 | Close-out | 4 | 5 | 6 | 5.28 |
| Total | | | | | 200.7 |

1. **Cost Estimates:** Viking project is estimated to cost approximately USD 93.328, as detailed in *Viking Project Cost.xls*
2. **REFERENCES:**

*Chapter 3, Applied Software Project Management* Book, Andrew Stellman & Jennifer Greene