# MENTAL MODELS
## ALIGNING DESIGN STRATEGY WITH HUMAN BEHAVIOR
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# Appendix A

# How Much Time and Money?

This section presents estimates of how many hours each part of the process takes. With this knowledge and an understanding of whom to resource[1] on the project, you can calculate a cost estimate. The first section will divulge costs for the *complete* approach to creating a mental model. But don't become alarmed by the numbers; subsequent sections contain estimates for the six shortcuts which were described at the end of Chapter 2.

## The Complete Labor Estimate

The mental model method divides into five parts. It takes an average of 12 weeks to complete a large-scale mental model project from beginning to end, with a team of three people as project practitioners. A list of the five parts and which weeks they occupy is shown in Figure A.1.

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[1] See Chapter 3 and the *"Plan Your Logistics"* section of Chapter 9.

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Business Discovery | | | | | | | | | | | | | |
| 2. Audience Segmentation & Recruiting | | | | | | | | | | | | | |
| 3. Mental Model Synthesis | | | | | | | | | | | | | |
| 4. Alignment & Strategy | | | | | | | | | | | | | |
| 5. Structure Derivation | | | | | | | | | | | | | |
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FIGURE A.1.
The complete project plan.

The number of weeks is, of course, variable. There are points at which some parts run in parallel, which might not be feasible if you are playing both the project leader and project practitioner roles. You will want to add weeks to the Mental Model Formation part if you interview more than 16 people, or if you are doing this for the first time. If you have a large number of stakeholders to rally, you might add a week or two for Alignment and Strategy. The Structure Derivation section does not include interaction design, so you will want to tack on your ordinary estimates for that process.

The next five sub sections show you how to calculate the hourly estimates that make up this project plan. Note that the labor-hour estimates are based on my own recordkeeping as an independent consultant. Realistically, employees don't ordinarily pay this much close attention to the time it actually takes to do something versus the other minutiae of an ordinary work day. I find that for myself, I track between 15 and 20 hours of productive project hours a week, even though I'm "at work" 40 hours a week.

## 1: Business Discovery

**Stakeholder Interviews**: You will want to begin with some fact-gathering and project scope interviews with your Project Guides. These are the directors, executives, product managers, and others who are responsible for fulfilling the mission of the business. Assume that you will spend half an hour to an hour with each person, and that you will talk to at least 10 people. Budget an hour or two for scheduling the meetings, as well. Expect to take the same amount of time, or more,

to analyze what you heard, compile it into a report, and share it with everyone.

**Secondary Research Review**: At the same time, you will want to look at user research reports from prior efforts, both within your own department as well as other divisions. These reports will give you a greater understanding of where the organization has explored the whole user experience in the past. Estimate two to six hours for this review, plus an hour to discuss findings with your teammates.

### 2: Audience Segmentation & Recruiting

**Audience Segmentation**: At the second week of the project, you should have enough background information to begin audience segmentation. Expect to spend 6 to 12 hours doing your segmentation and another 6 to 10 hours determining whom you wish to recruit and writing the recruiting screener. This process usually takes a week because you will need to check in with your project guides quite often to ensure that you are moving in the correct direction. For audiences who are

tricky to define, it may take longer. I have seen it take 24–40 hours, as people grapple with the new task-based perspective. For straightforward audience segments, expect an hour or two.

**Audience Segment Adjustments**: After you are through with the mental model, you will return to your audience segments and adjust them based on what you have learned. Depending on how much adjustment they need, this will take zero to eight hours. This work is represented by the green square floating off to the right in week 9 of Figure A.1.

**Recruiting**: The estimate for recruiting depends on whether you are doing it in-house, recruiting from a pop-up window, or hiring a recruiting firm. Estimates for the first approach vary wildly, but you can expect eight hours a day for eight days. For the pop-up approach, expect to spend three hours a day for eight days. For managing a recruiting firm, expect one hour a day for eight days, and between $100 and $150 per participant.

### 3: Mental Model Formation

**Interview Prompts**: The next six weeks cover the creation of the upper half of the mental model. You will begin by preparing the interview prompts while the recruiting is taking place during week three. Budget about eight hours for this task.

You can begin your interviews in week four while recruiting is still underway. The most important variable for your estimates is the number of interviews you conduct. This number governs not only the time it takes to collect the data from the field, but also affects how long it will take to comb all the interview transcripts and group the resulting information. I recommend interviewing between four to six participants per audience segment, until you start to hear repeated patterns.[2] Consider carefully which of your audience segments are worth studying now. Take a close look at what you want to accomplish in follow-up projects, and whether a certain audience segment can be put off

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[2] See the *"Estimate the Tally"* section of Chapter 5.

for a few quarters, or whether they should be included for greater understanding.

**Interviews**: I budget 1.25 hours per interview. Each interview should take about an hour; you will spend a little time beforehand getting prepared, making sure you know the participant's background and which audience segment he belongs to, getting your team members in place for the interview, and so forth. If you are traveling to each interview, add travel time to this estimate.

**Combing Transcripts**: You can begin combing transcripts as soon as they are available from the transcribers. Transcribers take between an hour and three hours per transcript. Depending upon the experience, energy, and ability to concentrate, expect the people combing the transcripts[3] to take between one to four hours per transcript. I have met only one person[4] who can comb a

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[3]   Combing and grouping are part of the analysis phase of the process. They are explained in depth in Chapters 8 and 9.

[4]   This person is Carolyn Snyder, author of *Paper Prototyping*; www. snyderconsulting.net

transcript in an hour. The number I use for myself is 2.25 hours per transcript. (I have the experience and the energy, but not the ability to concentrate.) If you are combing into a cumulative document, it will start to take less time as you eventually find tasks you already have named in the document; however, it can also take longer when the document is so huge you have to spend time hunting these tasks down. (Hint: this is when an outline view comes in handy!)

**Grouping Data**: Grouping is not a function of the number of transcripts, but a matter of how many total tasks you generate from those transcripts. Nonetheless, I tally the total grouping hours and divide by the number of participants in order to come up with a good figure on which to base an estimate. Over the years, I have tracked the hours: the average time it takes me to group is three to four hours per participant. This figure, of course, varies. For a particularly long,

in-depth project, it took me 2.9 hours per participant. For a project involving complex task relationships between audience segments, it took me 3.1 hours per participant. For a project that had a very wide scope, it took me 3.6 hours per participant.

**Mental Model Diagram Review**: Once you have the mental model data, you will want to add some hours for converting it to diagram format. I have made this relatively easy by providing a script,[5] so I calculate one hour here. Add about three hours for a review workshop with your team of project guides. If you need to travel to meet with the group, be sure to add travel time.

**Decorating Diagram**: After I have completed Gap Analysis and Strategy, I go back and add visual indicators of information that the team has determined is important, such as geographic location. Tack on about 10 hours for "decorating" the diagram this way.

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[5] The script is available on the book site. See the first section of Chapter 10 for instructions on how to use it.

This work is represented by the green square in week 11 of Figure A.1.

**Project Management**: Add at least an hour per week during this period for communication and coordination among the members of your team.

### 4: Alignment & Strategy

**Content Map**: In parallel with the mental model work, someone else should pull together a content map. (Content maps are presented in more detail in Chapter 12.) This map includes all functionality that exists or is intended for your solution. Because it is a separate process from the mental model, be sure that you take into account that a mapping exercise like this can take from 10 to 60 hours of someone *other* than a practitioner's time. Plan to begin early enough that it will be ready when the mental model is complete.

**Mental Model Findings Report**: After the mental model has been reviewed by the team, you will want to pull together a report that explains your findings and any adjustments

to the audience segments. This report takes about two hours for one person to write.

**Alignment**: Slotting the items into the content model against the towers in the mental model is a long process. You will work with all of the project guides, within their individual areas of expertise. I have seen this process take from eight to 30 hours. It requires a lot of attention to detail and covers many strategic decision points. I should point out that these estimates include the presence of all your practitioners. If a meeting takes two hours and there are three of you present, the total is six hours, which I reflect in my sum.

**Printing**: After slotting is complete, and you have "decorated" the diagram, you will want to get the diagram printed so you can post it on the walls. Unfortunately, printing is nontrivial; I discuss the ins and outs at the end of Chapter 10. This process can take two to six hours of someone's precious time.

**Gap Analysis**: Next you will conduct a gap analysis session with the project guides. This session takes about six hours.

**Gap Analysis Report**: Writing and presenting a report of the decisions made during the session takes another three hours.

**Prioritization**: Finally, you will sit down with project guides again and try to prioritize what you want to do in the next four quarters. This session can be full of long silences, as team members ponder the real costs and dependencies of implementing a certain solution. Expect a four-hour session, meaning 12 total hours for the three practitioners. Writing and reviewing project plans afterward is something I consider the beginning of the next project rather then of the mental model process, so I do not include that estimate here.

## 5: Structure Derivation

**High-Level Structure Derivation**: The derivation of the high-level product structure and information architecture goes fairly quickly, since it is based on the mental

spaces in the mental model. Budget three hours for this, plus a three-hour review with the project guides.

**Nomenclature**: Finding vocabulary in the transcripts and crafting labels for the high-level structure you have defined goes faster with smaller groups. Anticipate at least two workshops: one to brainstorm many label ideas for each section, and another to consider which of these ideas has the most merit. Budget 10 hours total for finding the vocabulary, and the two workshops.

**Card Sort**: Start lining up participants for the tests in week 11, in parallel with your other work. Prepare the lists of content for each category at the same time. Early in week 12, take two days to conduct the tests. Spend the rest of the week analyzing the data and deciding whether changes are needed. This whole process will take around 30 hours.

As I mentioned before, this schedule does not include the time for the interaction and visual design. The beginning of a particular solution

design signifies a new project, separate from the production of the mental model. Likewise, this estimate does not include any measurement or testing of design prototypes, which I consider parts of the projects following the mental model.

### Summary of Labor and Other Costs

In Figure A.2, you see the same project plan with the approximate hours per week slotted into the cells.[6] These are the higher numbers that I estimated in the description of each of the above parts..

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[6] A complete project plan with hours for all the sub-components is available in the Resources section of the book site: http://www.rosenfeldmedia.com/books/mental-models/content/resources/.

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
|------|---|---|---|---|---|---|---|---|---|----|----|----|-------|
| 1. Business Discovery | 22 | 7 | | | | | | | | | | | 29 |
| 2. Audience Segmentation & Recruiting | | 22 | 32 | 32 | | | | | 8 | | | | 94 |
| 3. Mental Model Synthesis | | | 9 | 50 | 46 | 31 | 23 | 29 | | | 11 | | 199 |
| 4. Alignment & Strategy | | | | | | | 20 | 20 | 24 | 35 | | | 99 |
| 5. Structure Derivation | | | | | | | | | | | 20 | 30 | 50 |
| | | | | | | | | | | | | Total | 471 |

FIGURE A.2.
The complete project plan, with labor hours estimated for a 16-interview project.

In addition to these labor costs, you will want to include estimates for other cash outlays. For example:

- If you hire a recruiting firm, expect to pay between $100 and $150[7] per recruit.
- A good transcriber costs about $75 to $100 per one-hour transcript. You may be able to find someone at a lower cost, but you risk losing quality and completeness.
- Stipends for the interview participants, if needed, range from $50 to $100 per person.

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[7] All figures are in US dollars as of 2007. Prices will doubtless increase over time.

- You may need to pay for a conference system that will record your interviews, which will cost around $15 per interview.
- Printing a color version of the diagram, if you don't have an in-house plotter, can cost around $200.

These non-labor costs could add up to $6,000 to your project total.[8]

## Shortcuts

If either the required labor time or cash costs are too high, consider one of the shortcuts outlined in Chapter 2. Each section below describes the relative costs in time and money.

### Rough Sketch

Sketching a mental model by yourself at your desk is by far the quickest and cheapest way to come up with a diagram. But by definition, it is a sketch and will depict only your own understanding of the user's behaviors and philosophies. It is a pretty fragile model, but at least you have something to look at. A

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[8] These non-labor costs appear in the project plan posted in the Resources section of the book site 🐘 http://www.rosenfeldmedia.com/books/mental-models/content/resources/.

rough sketch like this is best used to persuade others to pursue the method.

## Rough Draft

The rough draft is the second-fastest and second-cheapest way to create a mental model. Gather in a room for a couple of days a team of user-representatives and a pile of research already conducted. Create a mental model based on your collective understanding. Since you will not be recruiting, conducting interviews or transcribing recordings, this shortcut is comparable in cost to the "Fly Under the Radar" approach. As I described in Chapter 2, no matter how good a job you do, you will likely miss a mental space or two, so treat this mental model as slightly more robust than a rough sketch.

## Rough Notes

Skipping the detailed analysis of transcripts will save you lots of time—say it will take a quarter of the time normally spent combing transcripts and grouping the tasks. The overall cost of the project will remain about the same, though, less the expenditure for the transcribers. You

will probably miss half the tasks, but you will capture the important ones and their corresponding towers and mental spaces.

### Fly Under the Radar

Creating a mental model in your "spare time" takes the longest of any of these approaches, simply because you are parceling it out into the extra hours you have available, which are inevitably few and far between. This shortcut ought to cost a little less than the complete approach because it encourages you to recruit singlehandedly and informally, thereby possibly securing free interviews. Making transcripts from the recordings might demand some cash, but perhaps you can call in a favor from someone in another part of the organization. The point here is to carry out the process in a low-key manner, letting it simmer on the back-burner and adding to it every once in a while.

### 30-Day Cycles

Dividing the method into 30-day sets will probably make the process take an extra month, depending on how you divide it,

although cost should be comparable to the complete approach. In the 30-day shortcut, the key is to interview fewer people at one time, so that it fits into the 30 days. Focus on just one or two audience segments at a time, narrowing your data set to four to 10 interviews. Accomplish one part of the method per 30-day cycle, as shown in the following examples:

### First 30-Day Cycle
• Stakeholder Interviews
• Secondary Research Review
• Audience Segmentation
• Recruiting
• Interview Prompts

At this point you need to decide on one or two audience segments to focus on.

### Second 30-Day Cycle
• Interviews
• Combing Transcripts
• Grouping Data
• Content Map (in parallel)

Now you have a choice: you can either select a different audience segment to interview, or go forward with the mental model you have constructed so far. The choice depends upon how distinct you think each segment's mental models will be. If they are different, then proceed with your current mental model.

### *Third 30-Day Cycle*
• Mental Model Diagram Review
• Mental Model Findings Report
• Audience Segment Adjustments
• Alignment
• Gap Analysis
• Gap Analysis Report

### *Fourth 30-Day Cycle*
• Decorating Diagram
• Printing
• Prioritization
• High-Level Structure Derivation
• Architecture

Now you are free to return to your regular rhythm, devoting further cycles to the development of one or more of the features

you decided upon, intermixed with testing and measurement.

### Piggyback on Usability Tests

Conducting shorter 30-minute interviews, and tacking them on to already-scheduled usability test sessions will possibly save time and certainly save money. You will have to reduce the focus of your investigation to a small set of topics in order to fit your questions into the 30-minute timeframe. While this approach results in less work during analysis, the whole process could conceivably take up the same span of time as the complete approach. The cost will definitely be less, since the cost of recruiting will be covered by the usability test project. The biggest risk is that participants selected by someone else might not necessarily fit your task-based audience segments.

## Comparison of Shortcuts to Complete Approach

The matrix in Figure A.3 summarizes the relative timeline and costs of each shortcut described in the previous section

in comparison to the complete approach.
Depending on whether you are short on time
or money, you can select a good system for
creating your mental model.

| Week | Description | Duration | Cost |
|------|-------------|----------|------|
| Complete Approach | Choose segments, interview, comb & group, analyze gaps, derive architecture | ☐☐☐ | $$$$ |
| Rough Sketch | Sketch a mental model yourself | ☐ | $ |
| Rough Draft | Create a mental model based on existing data and collective understanding | ☐☐ | $$ |
| Rough Notes | Conduct interviews, but skip transcripts and pull tasks from your notes | ☐☐ | $$$$ |
| Fly Under the Radar | Conduct interviews and do your analysis as you can spare time | ☐☐☐☐☐☐ | $$ |
| 30-Day Cycles | Accomplish one part of the method per 30-day cycle | ☐☐☐☐☐ | $$$$ |

FIGURE A.3.
**This cost matrix compares the full approach to the shortcuts.**

There are probably more ways to go about
creating a mental model than I have described
so far. Feel free to formulate your own
approach. Use parts of this method according
to the level of time, money, and commitment
available in your situation.