

Chat with Dr.Cem

Dr. Cem: I often deal with complex tasks that have many interacting parts. For an example, "KangersBuyAndSellModel".

The diagram is a PDF. As I mentioned last week, I am studying quantitative investment modeling as a good example of automated exploratory testing. The diagram starts by listing the reasons that I bought stocks (either in real life or in a simulator). I reviewed several hundred purchases and a year's worth of detailed notes. This first page sets up my "Buy rules". There are about 31 factors that I am identifying in this model and attempting to organize.

The next pages lay out my sell rules. For example, if I bought a stock because I believed it was undervalued, then on another page, I identify the circumstances under which I would reappraise the valuation of the stock. There are perhaps (I am guessing, not counting) 30 decisions on that page.

Overall, this is a very complex decision tree that I am using to guide my own thinking and to teach to my students in a course on investment modeling in software engineering

Eventually, we might write a program (an automated trading system) to implement part of this model, so you could say this is a draft of a requirements specification

The model did not come to me all at one time.

I refuse to allow templates or structures to force me to provide detail that I am not ready to provide

On the other hand, the buy/sell model was far too complex for me to keep in my head

And it was too messy and complex for the scribbled diagrams I was writing at my desk.

Over a period of several weeks, I was able to refine the model to a point that, for now, is good enough

I have designed several parts of programs using this, including a few that were bestsellers in the 1990s

Similarly in testing, I often get confused when I try to understand a program

Sometimes what is confusing to me is the sequence of operations or the sequence of decisions in the program

In that case, a map like the one I showed you for buy/sell works pretty well for me

Markus: I think this is exactly where you are moving from a "mind map" as I understand it to a "concept map". Connecting ideas for a "reason"

Dr. Cem: There are of course many variations for capturing a menu structure or a transaction flow

Markus, I refuse to make the distinction that IMHC is making

I think it is one of the many pointless distinctions that confuses newcomers and appears on certification exams

The type of model that I have discussed so far, where I am trying to map a transaction flow or a sequence diagram, comes from working with the program or from a specification if there is one

But I am trying to analyze a sequence of behavior or a sequence of decisions by seeing them in action

Mike Kelly and James Bach talked about this as "touring" through the application.

I use the map to record the complex parts of the tour. A very different use of the tool is for specification analysis. Bach and I started using maps this way in the early 1990's when he was developing a much earlier version of the heuristic test strategy model

He was test manager at a company called smartpatents. I was a consultant to his group. Smartpatents allowed you to search a huge database of patents--a terabyte of information. That might sound like not so much today, but it was almost inconceivably large back then.

We had specifications, but of course they were incomplete and they were works in progress. After all, the underlying problems were not resolved, so how could the specification tell us what the eventual product would be?

Burrowing through the specifications was difficult and boring. Some of the testers hated it.

So we put 4 pages in front of everyone.

Let me abbreviate heuristic test strategy model as the HSTM

Imagine having 4 pages, one with the heading "Product Components".

One with the heading "Project Factors and Constraints".

One with the heading "Quality Expectations".

And one with the heading "OH NO!!!!" (or if you prefer "URGENT PROBLEMS")

Now start analyzing the specification.

Every paragraph of a specification has information. It is telling you about the product, defining some feature or some part of the product Or it is telling you about how the project will be run

Shaham Yusuf: sounds great

Dr. Cem: Or it is telling you how to decide whether the product is adequate. For example, if the primary point of a release is to improve performance (speed, responsiveness), then that is the main quality expectation and every feature will be evaluated in terms of performance improvement compared to a previous version.

Weekend Testing: Shaham's case - 1200 pages @Cem, how do you see that?

Weekend Testing: specification of 1200 pages

Dr. Cem: I helped someone work through a large cubicle of specifications that spanned 20 years of development and contradicted each other and sometimes the 1980 version was more up to date than the 1997 version. The tester was so frustrated with these documents -- we didn't count the thousands of pages, but there were many.

She would read for a while and fall asleep, Not because she was exhausted but because everything referred to everything else. There were too many details to keep track of and so she had an information overload.

When you find yourself falling asleep while reading even though you are not tired, it is often a cognitive defense for dealing with information overload. You just shut down

Here she was at the start of the project, had finally gotten a 10-year wish to start a complex project as the lead tester at the very start, and it was impossible to work through the specification

She needed a way to do "active reading" of the documents in order to organize the information

Rather than trying to understand everything that she read, she needed to classify it so that she could see the cross-references, the places where the same concept was discussed, where the concept was contradicted, replaced, etc.

And so she switched between sorting (read the spec, put the idea into a box) and once there was a trend, interpreting

I don't know how else anyone can deal with large collections of documents like this

When I serve as an expert witness in a lawsuit, analyzing the development documents (all of the emails of all of the people on the project, along with all the specs and bug reports); I do much the same thing

Markus: Sounds like the "Getting Things Done" concept to me

Dr. Cem: The question from there is what is the best structure for active reading?

Markus: See it and immediately decide what to do with it.

Dr. Cem: And I have not found a "best structure" -- Bach's heuristic test strategy model is one very useful structure. But I point to several alternatives in the [spec-based testing](#) video

@Markus--this is exactly NOT seeing and deciding what to do with it

Instead, we are intentionally putting ideas into piles that we will decide what to do with later

Unless we feel like doing something with them now.

The key aspect of active reading is that you go through complex or difficult material and organize it your way instead of the way the author presented it.

In this way, you see the contradictions and the holes in the original presentation

Many times at smartpatent, testers would notice that something was underspecified.

They would work through a bunch of unrelated pages, see several mentions of a feature or a piece of data but a key piece of information would be left out. So they would make a list of open questions and ask the programmers a set of questions, perhaps two questioning sessions per day.

This had a big effect on the design. The gaps in documentation -- IN THIS CASE -- often represented gaps in thinking, and therefore represented bugs-in-progress

In several cases, programmers stopped a question/answer session to check (and then fix) their code

Note how different this is from telling someone that their specification is unclear.

That is a general statement, and it is often rejected by the author of the document, who says you are just too inexperienced to understand what is in front of you. But a more thorough analysis, that lets you say, "Can you fill in this gap right here?" gives you a much better basis for respect in your discussion

The concept mapping tool provides a way to organize this information that is much more efficient than pads of paper, notebooks or flipcharts. That brings me to several of the quality criteria that I apply when I work with a mapping tool -- that is, what are my expectations of the tool

Markus mentioned an important one. The user interface must get out of the way. It must be easy to quickly enter topics and subtopics

However, the initial blast of many ideas, in a brainstorm that you can't write down fast enough, gives way to a very different type of entry

After you have written down the obvious stuff -- for example, if you are sorting information into the categories presented by the HSTM, then your first task is to make a map of the HSTM so that all the information about the product becomes subcategories under the HSTM elements

After you have entered the obvious stuff, you are now working more slowly you read a little, maybe search some other documents, and then make an entry.

Often, the entry is a "note", a discussion or amplification of something that is already there, or a reference to information in a different place. Sometimes, you reorganize the material. You realize that what you have been treating as three topics is really just two, and you have to move a bunch of subtopics into different places.

So the ability to modify the map is very important to me.

For me, modification is more important than fast entry

I want to be able to sort the subtopics that branch off a topic, in any order

I want to be able to view the topics or subtopics as an outline and sort them in that format

I want to be able to move groups by grabbing them, and move the collecting to a new topic

I don't want to do this one at a time --- zzz zzz zzz --- I want to be able to mark everything on the map that I am trying to collect and put it together at once

Weekend Testing: :)

I want to be able to add notes to a topic as well as links, so that I have explanations differentiated from subtopics

I want to be able to put references with hyperlinks

I want the document to handle large maps

This is not a toy task. I am doing this because I have a document, or a set of documents that are too complex for me to understand

And so my map will be very complex.

That means that the tool must handle a lot of data without error

That the tool must let me easily expand and collapse my view so that I can always focus only on the things that I want to focus on

I like the idea of workbooks (in excel) and so the notion of related maps

Also, I have to be able to control the formatting so that everything that SHOULD appear on one page DOES appear on one page.

You can see in the buy/sell map that different topics are organized differently so that each main topic can fit on its own page

This was very important for me.

I don't know how inspiration has changed over the last 18 months, but when I last looked at it, I liked how it handled outlines, but was disappointed in how little control it gave me over sizing for printing

(Inspiration is widely used here by teachers. It is inexpensive, reliable, and has very good graphics handling.)

Dr. Cem: If you look at Michael Bolton's blog, <http://www.developsense.com/2009/12/structures-of-exploratory-testing.html>

You will see a link to an update to HSTM that Michael proposed in Better Software, <http://www.developsense.com/articles/2006-05-TimeForNewTestIdeas.pdf>

He added a new concept, or a new level of detail, to James' structure.

His addition involved analyzing many of the different ways that time could play a role in the system

Imagine revising James' HSTM to add Michael's material. How easy would that be? If the answer is that in the tool you are using, it would be easy to add this, and then easy to throw in subtopics to reflect the product and it would be reorganize the other topics in HSTM to align better with this addition, and then you have a tool that might be useful. If not, you should look for a different tool

One of the surprising things that I've noticed is that different people achieve this level of flexibility with different tools. For example, my wife Becky (an education professor) far prefers inspiration for this. I far prefer mindmanager

Neither of us is wrong, we are just different

Now, imagine that you were going to focus on a new test technique called "interference testing" (I call this new because it is not on Bach's technique list in the HSTM)

The idea with interference testing is that one task is going but something gets in its way. Perhaps you block access to a resource that the first task needs. Or you change a piece of data while the first task is using it, etc.

This is all testing in time.

Imagine modifying your map so that it now puts a group of techniques, and cross-references techniques to issues (like time) and then somehow sorts aspects of the products into the new boxes. Again, the question is, can you get your map to do this, and can you create a map that doesn't get unreadably complex in the process?

The answer in my experience is that this takes many iterations--the cross-references get too complex to be useful if you are analyzing a long spec or a complex product

So a tool that doesn't make change REALLY EASY is a killer for complex cases

CHANGE OF FOCUS

For next week, the goal is to apply last week's learning and today's to a product

Markus: Try making a mind map of yourself as main topic add everything you can think of and then cross-ref it

If that looks good you have found a great mind mapping tool

Links of Interest: Touring Heuristic - <http://www.testingreflections.com/node/view/2823>

By Mike Kelly