ConceptDraw MINDMAP 7

Quality Whitepaper

Solve (Production) Crimes Just Like on TV, Only Better

How mind mapping software can help you get to the bottom of supply chain screw-ups

By Richard Aria & Hobart Swan

Faced with complex problems, how can quality management professionals access both the intimate details and the broad overview necessary to solve the crimes and misdemeanors of production? Consider mind mapping. It's what some business professionals at 80 of the Fortune 100 companies call their "secret weapon" for managing information. In this whitepaper, we will look at how mind mapping presents users with a nonlinear interface within which to combine ideas, insight, and data. Mind mapping creates a powerful environment for using intellectual capital to solve complex business problems. It even creates a kind of universal language that increases both interdepartmental and even global collaboration. Not bad for a very affordable, easy-to-learn application.

I'm not sure I want to have my mind mapped

A million things can go wrong in the process of making a product and getting it to market. And when things do go wrong, finding out what caused the problem—and making sure it never happens again—can be devilishly difficult. Crime scene investigation (CSI) television programs dramatize the process of solving murders. Maybe there's a market for a "PSI" show that reveals how a team of crack quality management professionals conduct "Production Screw-up Investigations." If there were such a show, the hero might well be "mind mapping" software that enables the team to visually map out the insights, clues, data, and evidence that lead to a comprehensive and permanent solution to the crime.

The Mouse That Roared

To illustrate how mind-mapping software can help solve production problems, let's open the case file of a certain electro-mechanical parts distributor. This distributor has a client that employs a "Just in Time" delivery process. As such, it's relationship with the distributor is organized to eliminate non-value added processes and to push the responsibility for outgoing quality on to the lower tier supplier—the distributor. The client's goal is to be able to simply open a box and immediately fit component parts into its semiconductor manufacturing equipment production line.

This kind of lean supply chain worked very well for all parties concerned… until it didn't. After years of working together, the parties to this supply chain—the manufacturer, the shipping company, the distributor, maybe a second (or third or fourth) shipper, possibly a labeling/packaging partner, and the end user/client—had built relationships of trust that are the basis of successful just-in-time arrangements. But somewhere between the ore mining site and the end user, something went wrong. The distributor's product, a relatively minor electrical plug, was causing the semiconductor manufacturing equipment to fail. As a result, the client had to bring its production line to a sudden, unexpected, and expensive halt. The heat was on the distributor to find the culprit. Fast.

My Kingdom for a Horse

Tracing the cause of a product malfunction can, indeed, be a lot like unraveling a murder mystery. There can be any number of suspects, alibis, clues, motivations, and coincidences. You can easily end up with a lot of information in a lot of different forms, from spreadsheets and data to hunches and insight. The challenge, regardless of your profession, is to bring all that information together in a way that helps you find "whodunit."

Maybe you've seen a crime drama that shows a team of detectives huddled around a whiteboard trying to make sense of the information they've cobbled together. They've got crime-scene photos, a tire print, someone's left shoe… maybe a few index cards they've scrawled some thoughts on, a print-out of someone's phone records, a gas station receipt.

In some shows, the team tapes these things to the white board and draws lines between them to show possible connections. If it's a low budget show, they're using an old corkboard, push pins and some string to do the same. On some shows the poor detectives have no board at all. They just sit around talking to each other without any visual cues to help them.

Being that this is the 21st century, why don't these crime fighters have access to more sophisticated technology? The problem isn't that there aren't any such tools. Some tools are too expensive. Some are too difficult and/or time consuming to learn or to use. And some, like mind mapping software, are neither. They're just not widely known.

Enter Mind Mapping

If you find yourself in a situation like the distribution company described above, you may not have the time or resources to wheel in some major technological solution. But what you do have is the wisdom and experience of the people who make this supply chain happen. What you need right now is some way to capture all this intelligence, marshal the facts at hand, and solve the immediate problem. And that's where mind-mapping software comes in.

If you've never heard of mind mapping, you are hardly alone. Mind mapping software is a far-too-unknown methodology/technology that could be helping more businesses quickly unravel all sorts of mysteries. (In point of fact, mind mapping tools are used selectively in about 80 of the Fortune 100 companies. Nonetheless, it remains one of the business intelligence world's best kept secrets. That may be in part because many users consider it their "secret weapon"—and they want to keep it that way.)

The phrase "mind mapping" may conjure up images of people with strange contraptions on their heads that literally "map" their thoughts. In reality, mind mapping is an information management technique that is based on decades of scientific research (that won one researcher a Nobel Prize) into how the human mind prefers information to be presented. In a nutshell, our minds do a better job of remembering, organizing, and synthesizing information when it comes to us in many forms.

We tend to carry out business using (black) words on a (white) page. Yes, there are pie charts, graphs, and the occasional "executive dashboards." But by and large, business operates on the basis of written reports, PowerPoint presentations, emails, and maybe a few

tweets. Our minds, meanwhile, are starving for a richer visual environment filled with words, yes—but also with numbers, colors, and shapes. Our minds respond very well to information captured in a way that shows the spatial proximity between one thought or fact and the next. The mind's need for a richer, more spatially useful presentation of information is the same impulse that leads the detectives to bring out the cork boards and the string.

Mind mapping simply recognizes this same human need and brings the solution into the digital age. Unlike other approaches to information management, mind mapping is not expensive (think hundreds, not thousands, of dollars). Nor is it difficult to learn (think hours, not months, to learn).Lofty claims. But the proof is, as they say, in the pudding.

Capturing and organizing ideas

All too often at the start of a project, too much emphasis can be put on action at the expense of forethought. It is always important to get started. But it's equally important to take a short time to gather people's insights and hunches—their best guesses on what's going on based on their experience in similar circumstances. By providing individuals or teams with a way to quickly capture and organize ideas, mind mapping enables teams to make at least an educated guess about the direction they should head in before they jump in their squad cars and go screeching off, sirens blaring.

The early steps of creating a mind map are much like brainstorming: it's a matter of getting ideas out of your head and onto the page. If you are familiar with brainstorming, you know the first rule is that, essentially, there are no rules. There is no right or wrong idea, no good or bad idea. The only stipulation is that participants agree to treat each other civilly—no laughing at, criticizing, or rolling of eyes at another person's idea. (Note: you may want to read "Groupthink: The brainstorming myth" by Johan Lehrer in the January 30, 2012 *New Yorker* for a different take on civility and brainstorming.)

The goal of brainstorming is to generate ideas, to build off of each other's insights and experience and come up with some plausible starting points for further investigation. Imagine that you and your team are sitting in a conference room. You have a ConceptDraw mind map projected on a screen. You lay out the problem before you: a sudden breakdown in a supply chain has created major problems for a key client. You give the map a good title, so that you will be constantly reminded of the exact problem you're trying to solve. And then you (or someone who is a good typist) start capturing ideas as your team thinks about the possible causes of the breakdown, or the events that led up to it. The end goal is to get to that definition of root cause so that an effective solution can be implemented. You don't haul in the first suspect just because they have motive and their alibi fell apart. You make sure you've got the real perpetrator.

Using nothing more than the Enter and Insert keys, start capturing team members' ideas in whatever order they come in:

Figure 1: Brainstorming

For the purposes of this article, we've captured a dozen or so ideas. In a real production screw-up investigation, you might have hundreds of ideas—all of them captured in this intense, intuition- and experience-driven brainstorming process.

Once your team has a respectable number of ideas on the screen, it's time to give them some organization. Maybe you want to organize them according to which party would most likely be responsible for the problem. First you add these "branches" (on the left) that represent the parties involved:
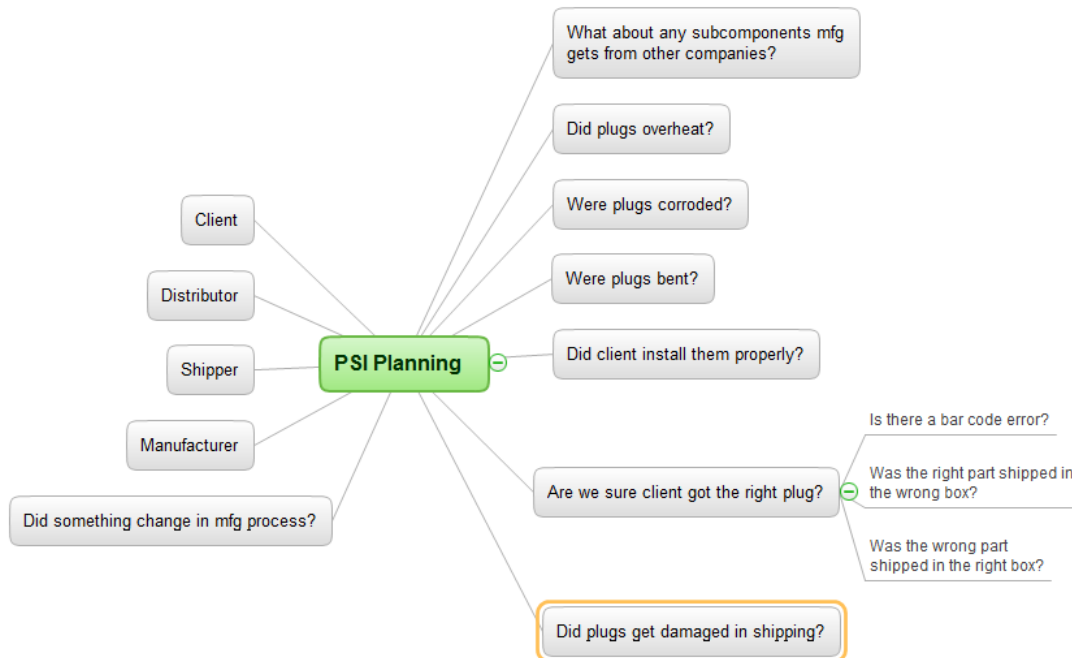

Figure 2: Organizing the brainstorm

There's the end user—the client that created the original technical specifications for the product and will decide whether you've achieved those specs. The manufacturer is represented too. They were supposed to follow those specifications to the letter—using the right components put together the right way. Did something prevent them from doing that in this case?

Then there are logistical requirements, such as packaging methodology, labeling, and shipment methodology. Did the right product with the right label get to the right client? That can be tricky to unwind. And the more your supply chain stretches offshore and around the world, the more parties that need to be represented in the map—and the greater the complexity of the task before you.

As all these thoughts arise, you capture them, then simply drag and drop them over to the responsible parties:
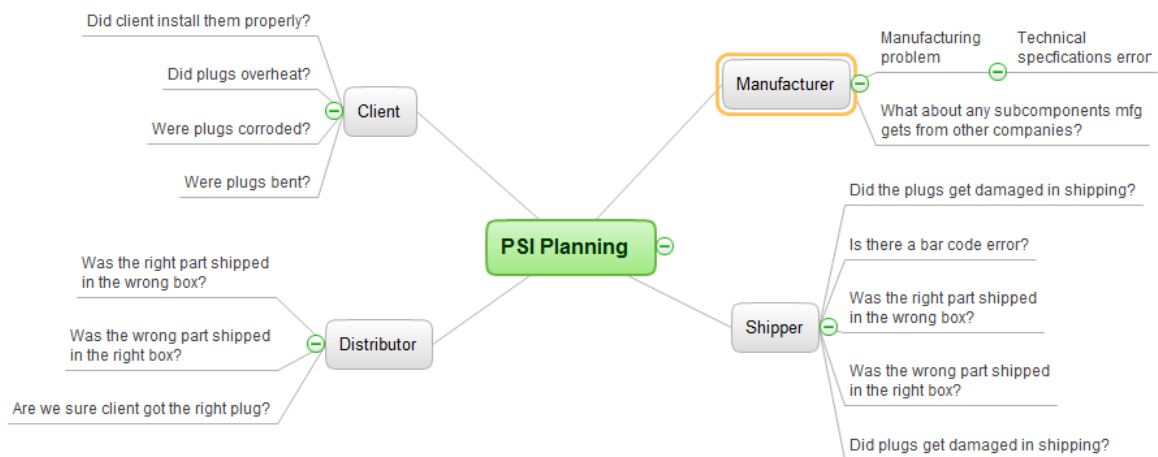

Figure 3: Drag-and-drop to restructure

Now you've started to create what we call an "information object." It's more than a document because the mind map will grow in time and in depth as you continue to add information to it as the investigation unfolds. By giving you a single-screen view of many different kinds of information, the mind map will help you solve the production screw-up mystery.

Creating an "information object"

The resulting mind map creates a kind of thinking environment, a place where you and your team can capture hunches, insights, experience, information, data, and ideas—and do it all on one easily navigated screen.

With the information before you in a view that lets you see the totality of possibilities, it's a matter of gradually building structure out of chaos. Mind mapping lets you quickly capture in

one place all of the information, data, insight, hunches, history, emails, notes, communications, Web sites, spread sheets—even tweets and social media content that bear on the problem at hand. I challenge you to name other software that allows you to create this kind of multi-source, multi-format information object: a single, source-agnostic view of a project.

The contents of this object can be easily shared with others. The better mind mapping applications enable map contents to be instantly viewed and saved as a standard outline, PowerPoint slides, PDF, or as a fully functioning Web page.

The software used to create the images in this article, ConceptDraw MINDMAP from CS Odessa, supports the creation of content-rich information objects in five ways:

1. **Resource management:** ConceptDraw enables you to visually associate resources to the tasks at hand. Rather than being buried in the hidden task pane of a project chart, the resource is visually linked to the task:
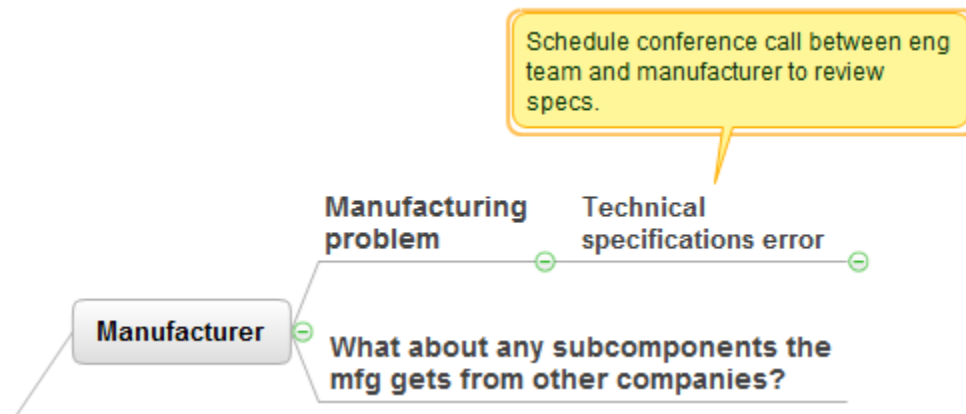

Figure 4: Callout

2. **Internal/External Hyperlinking**: ConceptDraw allows you to insert hyperlinks that put the information you need right where you need it. That technical drawing you need isn't buried in some associated file; it's attached to the part of the map where the team has raised questions about a possible error in specifications, appearing as a small chain icon. The hyperlink can point to any page on the internet, any kind of document or image—to literally anything you can access digitally.
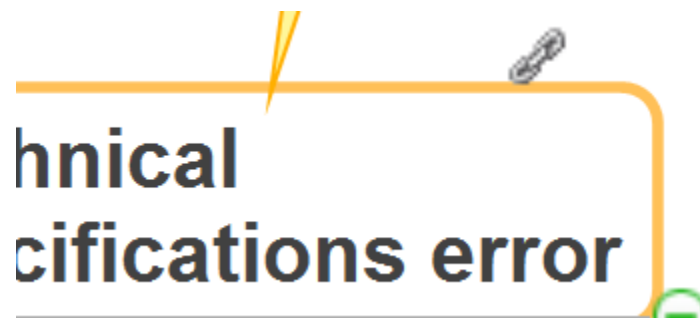
Figure 5: Hyperlink icon

3. **Note-Taking**: You can also add notes to the map. These notes can be a personal reflection on the matter at hand, or they can be information, spreadsheet content, or data you grab from somewhere—virtually anywhere—else. By means of a Notes window that can hold an unlimited amount of data, you have comprehensive access to the kind of granular detail that can help your find the real culprit:
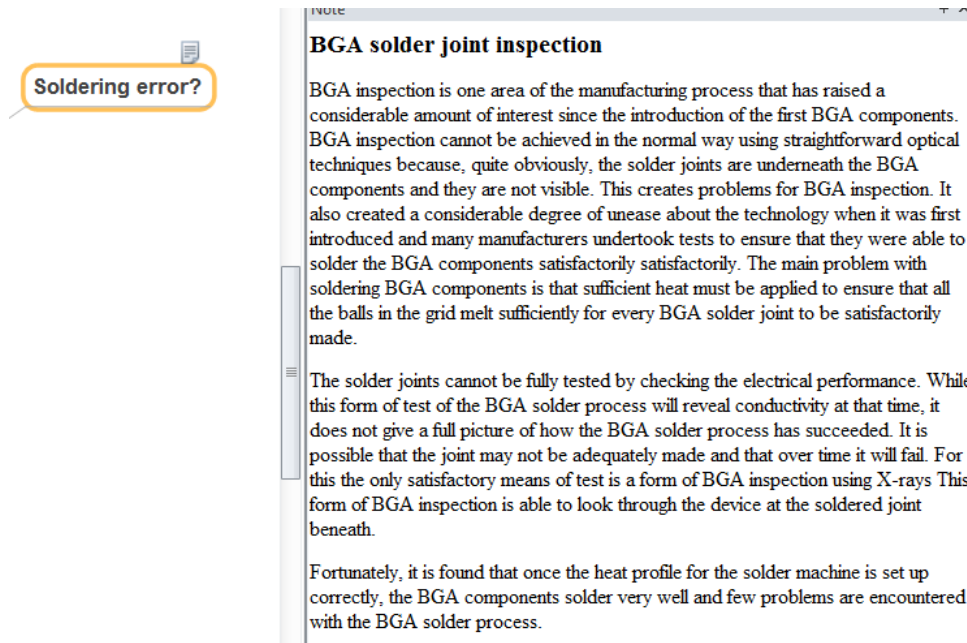

Figure 6: Notes pane

4. **Drag/Drop Functionality:** The exciting part of having all of this information available to you on one screen is that you can very quickly move it around to organize it into a form that helps you gain insight, raise questions, make plans, and reach conclusions. And all this can be done by simply grabbing a piece of information, dragging it to where it best belongs, and dropping it. Unlike more laborious cutting and pasting, the ability to drag and drop makes it easier to quickly make sense out of a mountain of information.

5. **Collapse/Expand View:** People are too busy these days to plow through 20-page documents, much of which contains information that may be irrelevant to them. Mind maps enable you to provide readers with a tremendous amount of information—but in a way that puts them in charge of what they choose to read. That means you can load a map with what might otherwise be an overwhelming body of information:
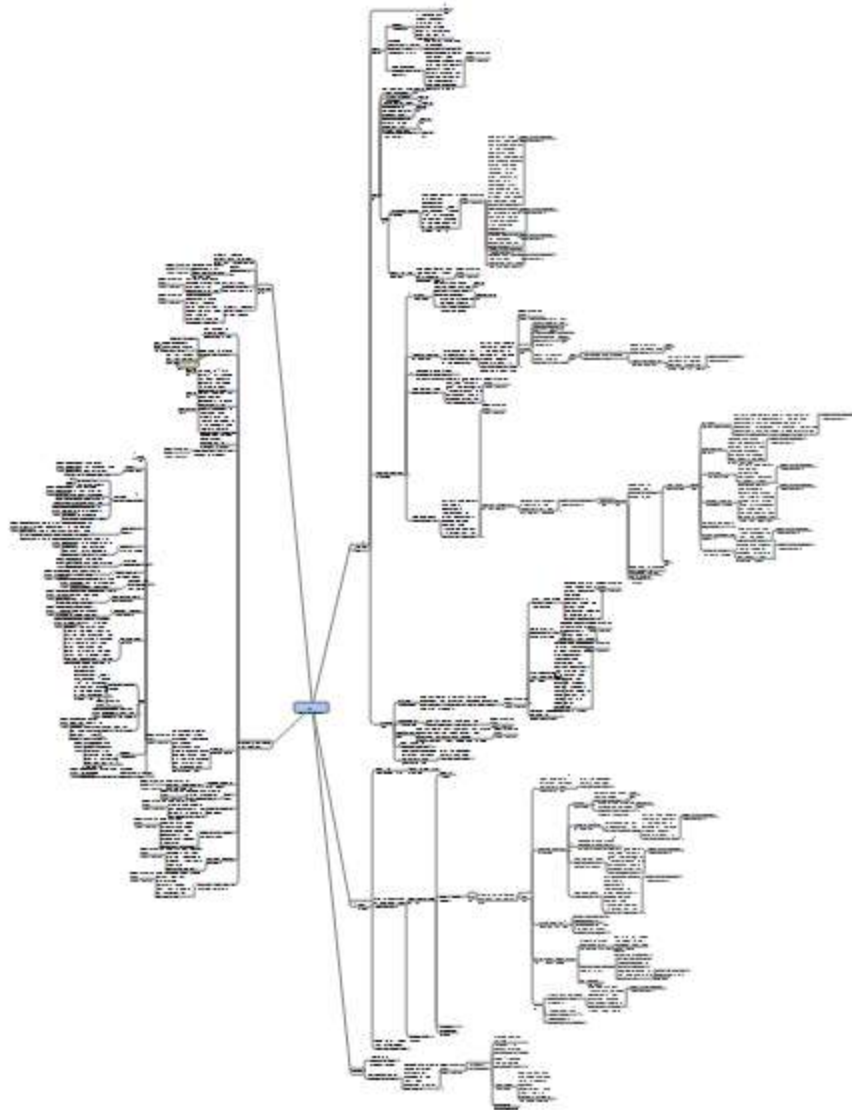
Figure 7: Fully expanded mind map

But by closing down all of the branches, the mind map takes on a much more approachable size:

Figure 8: Collapsed to just Main Topics

From this view, the user can simply click on the plus signs to expand the branches they're interested in. Thus, they are free to view the information they're interested in—and no more. As they move through the map they can add comments, create tasks, and add new information— adding this new information not in some separate document, email or spreadsheet, but right in the spot where it makes sense. And they can do this quickly and intuitively, as part of their workflow.

Putting ideas into action

By now, you and your team have met for a few hours and come up with some promising lines of investigation. Now it's time to put those ideas into action. Next to each idea, you can create an action item. ConceptDraw enables you to end each meeting by creating checklists of next steps:
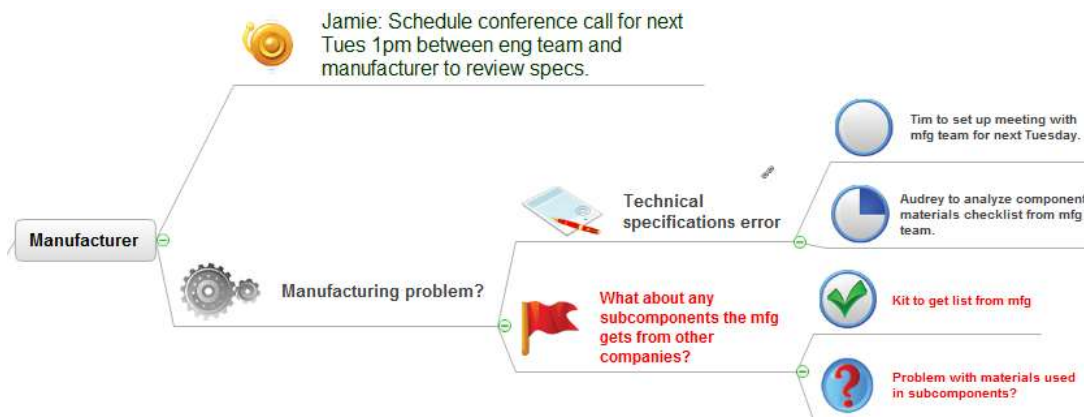

Figure 9: Adding Symbols to track progress

You'll notice in the above map that there are suddenly lots of visuals elements. This is one of the key, but subtle, elements of mind mapping. Use of icons, images, and colors goes back to what we discussed in Part 1 about capturing information in ways that stimulate more of the human brain. Most mind mapping applications come equipped with their own library of visual icons you can add to maps to bring attention to information in the map—and to make it easier for you to recall what is in the map.

Which do you think is easier to remember: A sentence in the middle of an email reminding you to ask about subcomponents, or a few words on a map next to a big red flag? Much of the value of mind mapping is that it makes it easier for you to think offline about the matter at hand. And "offline" is when many of us get our best thinking done.

And then there are the circles that look like little pie charts. Those circles enable you to track the progress of a task over time: The more of the pie that's filled in, the more that's been completed, until the check mark appears to indicate task completion. Using these and other icons, you as a manager are able to quickly scan the map for team progress.

It is in this way that the map becomes an information object. As the screw-up investigation progresses, the mind map serves as a repository of team tasks, new information, new conclusions, and next steps. Prior to the next meeting, for instance, you can ask team members to open up the map and post documents, make comments, and mark progress on their tasks (notice how the pies are more filled in than in the previous version of the map):

Figure 10: Updating progress markers

Oftentimes, a large part of meetings are wasted trying to remember where you left off, what needed to be done in the interim, and who was supposed to do what. When you use a mind map to manage meetings, you project the map onto the screen and everyone can quickly see what progress has been made, what new information has been discovered. As the project evolves, the meeting map evolves with it, creating a concise, information-rich single-document history of the project.

Leap Language Barriers

One advantage of mind mapping over traditional "thinking" is particularly relevant in a market economy. One of the world's largest electronics manufacturers describes how it uses mapping when working with teams who don't share a common language. Mind mapping facilitates communications because information isn't managed as a long text document filled with sentence and paragraphs, but a visual document with words, phrases, images, and icons.

This is significant because the more complex the language, the harder it is for non-English-speaking people to participate. Mind maps are created using words, short phrases, and using spatial relationships to show which ideas are related to each other. This kind of visual language helps you can get much greater participation from overseas partners.

As this global manufacturer notes, the ability to get input from all stakeholders is huge. Ideas based on local insight and experience can often provide a penetrating view into the problem at hand. This ability to create clear, concise information views can provide a benefit closer to

home too. If you've ever tried to get an engineer and a marketing person to communicate with each other, you may appreciate ConceptDraw MINDMAP's ability to create a clear, concise, visual language that breaks down communication barriers between floors, or even continents.

A Quick Fix? Go deeper.

There is much to recommend mind mapping. If you decide to try it, you may be surprised by how quickly you can put it to practical use to realize tangible gains in how you do business. How it can help you is limited only by your imagination. Again, looking at the practices of Fortune 100 users, mind mapping has a great deal to offer across companies.

These business professionals use mind mapping to map out marketing campaigns, conduct strategic planning and research, for project management tasks (CS Odessa offers the ConceptDraw Office bundle that includes an enterprise-strength project management application, as well as a Visio-like graphics program), and to ferret out production problems.

Speaking of which, let's return briefly to the case of the faulty plug. As it turns out, an internal team at the distributor used ConceptDraw to discover that the problem was with the manufacturer. Unknown to the distributor, the manufacturer had modified its manufacturing process, using a slightly different alloy that originally specified. The team successfully used mind mapping to bring together relevant information, quickly organize it in a way that helped them gain insight into the problem at hand, and then to ultimately find the culprit.

The ultimate goal as a quality management professional is to find permanent remedies to the problems you face. In the rush to execute, it can be hard to step back and make sure that you have gotten to the bottom of the issue. Yes, in the case of the faulty plugs, the problem was the alloy used. But is there a deeper problem? Maybe the manufacturer didn't do adequate testing on the new material. Are they doing that with other products they're making for the distributor? What steps can be taken to make sure the problem doesn't happen again?

Mind mapping gives you the ability to rise above the immediate details and get a broader perspective on the problem, the kind of vantage point that can make you feel confident that you've gotten to the root of the problem—that you've found a comprehensive and permanent solution.

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