AI & Mind Mapping Software

How natural language processing, deep learning, intelligent agents and image recognition will revolutionize visual thinking



by Chuck Frey

The Mind Mapping Software Blog

mindmappingsoftwareblog.com

Are you ready for a revolution in mind mapping software?

It's far from a case of marketing hyperbole. Based on research I recently conducted, conversations with all the leading mind mapping software developers and some deep thinking about its potential, I'm convinced that AI is poised to radically alter the ways in which we interact with mind mapping software.

In this report, I will share my findings and the applications where I believe AI will make the biggest impact on today's mind mapping software. Fasten your seat belt. Were in for a wild ride!

THE STATE OF ARTIFICIAL INTELLIGENCE

Unless you've been living on a beach somewhere, unplugged from the world of technology, you've probably heard artificial intelligence mentioned in any number of places. It's already a big part of our day-to-day lives, but in a mostly invisible way.



We don't realize that it is working for us in the background, enhancing experiences like conducting Google searches, using convenient tools like Siri, Cortana and Echo to play music, fetch the latest weather forecast and control our home devices. All of these and much more are enabled through AI.

Artificial intelligence involves the use of smart algorithms that enable computers to interpret what we want, decipher our spoken words and discern patterns in large volumes of data. Recent advances enable this "smart software" to learn using neural networks similar to our brains.

AI is focused on a number of key applications and technologies, including:

▸ Speech recognition/natural language processing

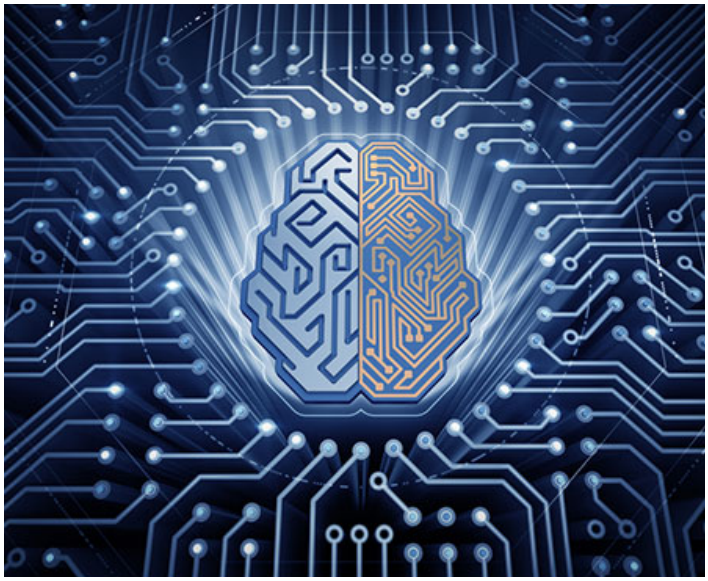
In order to understand what were saying, computers need to be able to interpret our speech. Natural language processing software has gotten dramatically better at doing this in near real-time, enabling us to give spoken commands to our smartphones and other intelligent devices, and have them understand us with a very high degree of accuracy. Unlike previous technology, like computer dictation, today's tools don't have to be trained to recognize your voice.

Speech recognition is used in applications like voice search, speech to text dictation and an intelligent home devices like Amazon's Echo and Microsoft's Cortana.

▸ Image recognition

Today's AI software has gotten incredibly good at discerning patterns in images, such as faces. It's this technology that enables Facebook to identify the faces in your pictures. It's also behind the cool face recognition security in the new Apple iPhone X. And it can interpret medical X-rays and body scans with an accuracy that exceeds highly trained human radiologists and doctors.

▸ Deep learning



One of the most intriguing and powerful branches of AI is deep learning. This technology uses neural networks to scan massive amounts of data, looking for patterns that we can't even see. It also learns as it goes, anticipating the needs of its users.

In one famous test, a deep learning computer called AlphaGo from Google learned how to play the Japanese game Go in a few hours. Go is widely considered to be the world's most sophisticated board game. AlphaGo beat 19-year-old Chinese prodigy Ke Jie, the world's best Go player. Other players who have gone up against this formidable cyber-opponent *"have praised the technology's ability to make unorthodox moves*

and challenge assumptions core to a game that draws on thousands of years of tradition," the New York Times reports.

▸ Intelligent agents



This flavor of AI includes chatbots, intelligent software that can help visitors to a website to find answers to their questions. In the process, it carries on a chat with the visitor just like a human being. It does so by parsing the request and then comparing it to its database of possible responses. It then displays the correct response or asks for more information. These customer support "robots" are so effective that an entire cottage industry has sprung up to create and support them. They are already viewed as an important element in any online marketing program.

Intelligent agents also include shopping bots, which scour the web looking for deals on the products and services you want, personal agents, which can monitor websites for criteria and topics you specify, and data mining agents, which scour the web looking for specific information.

How do these technologies apply to mind mapping software?

In more ways than you can possibly imagine.

If you consider the idea that mind mapping software has evolved into a rich, multi-faceted information management tool, then it's easy to see how artificial intelligence technology has the potential to intersect with it in many different ways.

In this section of the report, we'll take a look at what's possible. Mind mapping software developers haven't implemented AI yet, but are looking at its potential very seriously.

WHERE ARE WE HEADED?

In researching the effects of AI in other areas of business, such as marketing, it's very clear that the impact of it - at least initially - will be to enhance and extend human capabilities. Its "sweet spot" is doing deep analysis of large data sets, and

then serving up patterns and trends it has discovered.

Mind mapping software as a data presentation tool

If we overlay that perspective on the world of mind mapping software, it's also clear to see that it has the potential to move beyond its role as an input device, where we enter and arrange topics. Increasingly, it will be used to present data to us from other sources, including AI engines, for us to view, interpret and manipulate.

We're already starting to see the early fruits of that from InfoSeg S.A., which started down this path in 2013 by parsing LinkedIn profiles and displaying the data in MindManager. Last year, InfoSeg's managing director, Jose Guerrero, reported in an interview with the Mind Mapping Software Blog that his firm is now using IBM's Watson Natural Language Understanding (NLU) AI engine to semantically analyze large amount of text and parse it into mind maps. Essentially, the mind mapping software is being used as a rendering engine to display the results of AI analysis done outside of it.

In that conversation, Guerrero explains how it works:



"*IBM Watson™ NLU processes text and web pages and generates a full semantic analysis of categories, concepts, emotion, entities, keywords, meta data, relations, semantic roles and sentiment. The result of this semantic analysis is a series of lists containing very complex information. It would be very difficult to understand these results if the user received them as linear text or web pages. It would be almost impossible to see the whole picture. Mind mapping helps the user to see the "whole picture" and work on the results in an efficient way."*

He foresees a toolset like this being an invaluable aid to experts who must sift through a mountain of information, looking for insights:

"For example clinical or research teams of physicians have to read thousands of academic papers every year. This is becoming almost impossible for them because of the lack of time. AI plus mind mapping automation is probably the only solution.

The possibility of improving their productivity by 30 or 40% would be an enormous achievement," he explains.

Mind mapping software developers are already starting to look in this direction:



Olin Reams, CS Odessa: "*The process of mind mapping is to capture information and then use it in any format you require to work on. The one thing that mind mapping cannot currently provide is a potential solution. AI promises to be the breakthrough that will at least suggest a potential solution. We see the transitioning of mind map technology from a passive productivity and innovation tool to an active productivity tool."*



Shelley Hayduk, TheBrain Technologies: *"Capturing human thought and ideas always outshines automatic categorization and indexing technologies. However, blending the two can be very interesting.*

It is harnessing the power of artificial intelligence and knowledge management technologies with humans' personal perspectives and intentions that adds meaning to the process and that can lead to even more powerful insights."



Fiona Macintyre, MindGenius: *"If you are using mind mapping for research purposes, the ability to have the software automatically fill in gaps in your knowledge and make recommendations based on content or intelligently tie related information together would be hugely beneficial."*

Mind mapping software as a rich, multi-faceted information management tool

Today's knowledge workers are challenged like never before. They are the survivors of the Great Recession, the people who didn't lose their jobs - but are now doing the work of 2 to 3 people or more. They face down a tidal wave of information, data and knowledge every day, and must make sense of it.

At the same time, business velocity is increasing, but workers are dealing with greater levels of ambiguity and uncertainty than ever before.

Into this turbulent environment, AI-enhanced mind mapping software could be a boon for knowledge workers. Yohan Sohn from MindMapper paints a detailed picture of what that could look like:



Adding artificial intelligence to mind mapping software could deliver more efficient operations, intelligent knowledge management, and more processing power.

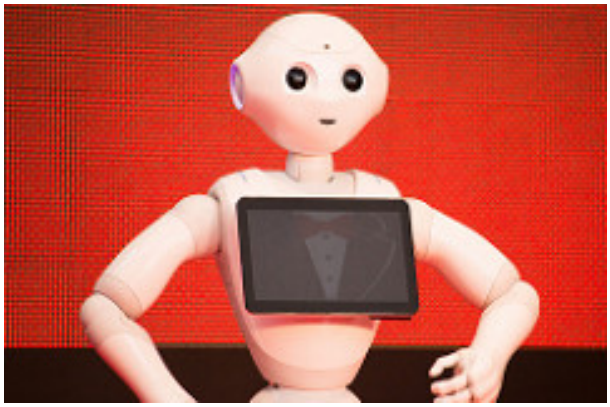
An AI-assisted mind mapping software will truly be a mind processor that will enable users to create, gather, analyze, and distribute new information effortlessly.
This may include:

- *Operations such as grouping scattered brainstormed ideas into similar groups and creating categories can be done with AI engine.*
- *Other operations such filling in images, acquiring data, tracking schedule, analysis, and even virtual mind mapping can be accomplished with AI.*
- *Additionally, scheduling operations from a calendar can be linked and automated for enhanced implementation.*
- *Mind mapping software can also be deployed as a data mining search, acquisition, analysis, synthesis, repository and distribution tool.*
- *Information can be gathered and analyzed and presented in a visual map format just by typing in your search string.*
- *Finally, end users will have instant means to relay this multi-dimensional information feed from the brain to AI assisted mind mapping software to create, synthesize, organize, collaborate, distribute and manage information efficiently.*

In short, mind mapping software becomes a more powerful information creation and management tool. Some of the benefits may include saved time, better decisions, creative solutions, and increased competitiveness.

AI definitely will play a pivotal role in mind mapping arena in the coming years.

INTELLIGENT AGENTS



Intelligent agents are designed to analyze data and make decisions about it on your behalf. Here are some of the ways they could work hand-in-hand with mind mapping software to make the lives of knowledge workers easier:

A dashboard map on steroids: Intelligent agents equipped with a set of business rules could monitor a variety of data sources, and report to you when any parameters appear to be out of the norm. In addition, they could look for patterns and trends that may not be visible to our brains, but can be discerned by intelligent software agents. Those insights could be displayed within your dashboard.

You will still have the ability to decide if you wanted to add that data to your dashboard or another map, continue monitoring it or ignore it. So you will remain the final arbiter of the technology.

Serendipity topics: Creative ideas seldom emerge from following the same old paths and modes of thinking. One way to employ divergent thinking is to use serendipity. In other words, introduce random stimuli that may not appear on the surface to have anything to do with your creative challenge, but may spur your thinking in new directions.

Serving up unique stimuli within your mind mapping program during a brainstorming session could be a great catalyst for creative thinking. These nuggets of inspiration don't have to be completely unrelated; they could quite easily be tangentially related to the challenge at hand – a solution from a related field, for example that could be adapted to your current challenge.This isn't something that today's software is designed to do, but is an application where AI could add a lot of value.

AI assisted research: AI connected to mind mapping software could conduct real time, ongoing research on topics that are of high interest to you. Here's how that could work, according to Dimitar Janevski from Seavus (the developer of iMindQ):

"Imagine real-time information on a certain subject, organized, categorized and connected in a manner that is understandable to you. The AI could build different topics of interest to you, and present it to you within the mind mapping software in a logically connected way. The user would still have control to disregard unnecessary information. In addition, the sharing of this information could be done in a fast and reliable manner."



DEEP LEARNING

Deep learning is where the biggest promise of AI resides. In this area of the technology, powerful computers and AI enabled software use neural networks to learn as they perform different tasks. Soon, they can perform them significantly better and faster than humans.

On the surface, this may sound scary, but in practical reality, this is already happening behind the scenes without you realizing it. It's how Facebook does facial recognition and Alexa parses out your speech to understand what you want it to do. In the short term at least, AI augments human ability but doesn't replace it.

How mind mapping software could incorporate deep learning:

Analyzing complex mind maps: AI is very good at intelligently parsing large volumes of data. This means it's likely to be very good at analyzing complex visual maps and discerning patterns within them that aren't apparent to the user.

Hey, you're copping my style: AI will someday be able to learn your mapping style and replicate it, so you don't have to do so much manual formatting of your mind maps.

Pre-emptive problem-solving: I envision AI within a mind mapping program being

able to anticipate problems in project timelines and to fix them for you.



Stephen Zhu, XMind: *"I think AI can get very good at learning your needs and about the dynamics of your market, company or project, collecting relevant information and offering suggestions on what to do with it."*



Laura Bârlădeanu, MeisterLabs: *"AI already offers many opportunities to add value to the experience of the user. At MindMeister, we use a form of neural network that helps our system understand the context of mind maps created by our users. This enables us to suggest the right kind of content to them, for instance, by showing them public mind maps related to the topics they've been working on, but also by suggesting relevant content while the user is building their own mind map."*



Dimitar Janveski, Seavus: *"Instead of wasting time to search different libraries, go through the data page by page, or result by result, with the use of artificial intelligence, a logical connection can be built between information in different locations which are very similar or interconnected. These connections can also be presented automatically with a knowledge graph or a mind map, where similarity and semantic of the searched content will have the highest priority when building the inter-related topics."*



Michael Deutch, Corel: "*We're very excited about the possibilities that artificial intelligence brings to our MindManager product roadmap. Corel already has a track record of introducing AI-based technology in our software. In CorelDRAW 2017, we introduced LiveSketch, the industry's first artificial intelligence-based vector drawing tool that interprets

hand-drawn strokes to create organic vector shapes. With LiveSketch, we've seen firsthand the amazing effect that AI tools can have on our users' workflows, giving them intelligent and responsive experiences that weren't previously possible."

NATURAL LANGUAGE PROCESSING

During the last several years, natural language processing (NLP) has gotten dramatically better at recognizing and understanding spoken word queries and written text. This involves not only recognizing the words, but understanding their meaning in context with each other.

Here's how NLP may impact mind mapping software:

Conversational queries and map searches: These appear to be well within the realm of possibility for AI-enhanced mind mapping software. Instead of interacting with our mind maps via mouse and keyboard, in the future we may be dictating voice commands to our software. The technology for doing so already exists, in programs such as Dragon NaturallySpeaking. You can already use this popular dictation program to dictate words and commands into Microsoft Office programs. It's only a matter of time until a leading mind mapping software program adds this integration.



Making the content of my maps more understandable: *"One criticism of mind maps is they tend to be written and structured in a way that is quite personal to the creator of the map. It can be difficult for others to pick up and understand the intent,"* explains Fiona Macintyre from MindGenius.

"Therefore, by utilizing the major improvements in Natural Language Processing that have been made over the last few years, map data could be turned into plain language that can more easily be consumed by all."

Adding richness to your mind maps: *"If you use your mind map as a way to integrate information from disparate sources, this is an obvious area that AI could enhance,"* adds Shelley Hayduk from TheBrain Technologies.

If you found this report to be valuable, please share it with your coworkers and colleagues!

ABOUT THE AUTHOR



Chuck Frey is the author of The Mind Mapping Software Blog, the leading website focused on mind mapping, diagramming and other forms of visual thinking. He has written hundreds articles and reviews about mind mapping software, and is widely regarded as one of the world's leading experts on mind mapping.

Chuck founded and managed InnovationTools.com, the world's leading website focused on innovation and creativity, from 2002 to 2011. He continues to write about business creativity tools and techniques, productivity and success strategies on his personal blog, ChuckFrey.com.

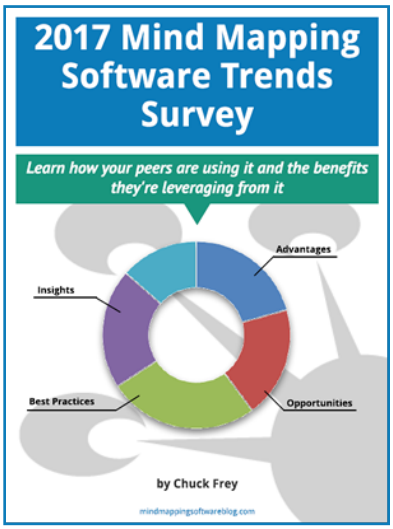
ADDITIONAL PRODUCTS & RESOURCES FROM THE MIND MAPPING SOFTWARE BLOG

The Essential Guide to Mind Mapping Software

The Essential Guide to Mind Mapping Software is a free comprehensive resource that will help you understand what mind mapping software is, how it can benefit businesspeople like you and what to consider when selecting a program that will meet your needs. This concise 30-page report contains everything you need to know to make an informed decision about investing in mind mapping software.

2017 Mind Mapping Software Trends Survey

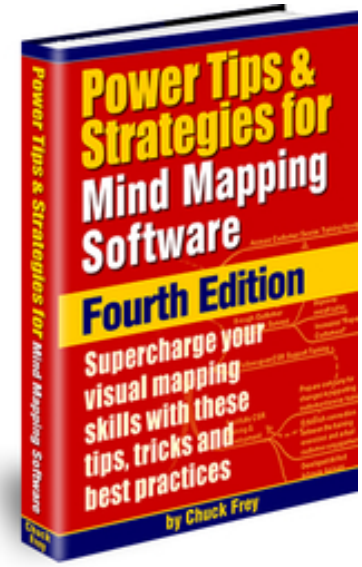
Creativity, productivity and making sense of complex business issues get a significant boost from visual mapping. It also gives its users a remarkable competitive edge, according to the results of the 2017 Mind Mapping Software Trends Survey.



Mind Mapping Software Training

Best practices, tips and insights to help you master mind mapping software - quickly and easily:

- Mind Mapping Software Quickstart
- Brainstorming and Creativity with Mind Mapping Software
- Project Management with Mind Mapping Software



Power Tips & Strategies for Mind Mapping Software

Supercharge your visual mapping skills with the best practices, tips and tricks contained in this popular book. Now in its 4th edition, it's the definitive guide to being more productive, creative and successful with this powerful type of business software. Unleash its versatility and power today!