

The continuing saga of discovery: How to innovate.

The term 'manufacturing' comes from the Latin *manus* hand + *factura*, a making. Obviously this term should no longer be used. We should change it to 'make'. The optimum process in making something would be to do nothing. Not even wishing it were there with a magic wand!

Every time an object is moved, touched, handled invites risk, adds labor and time and thus cost. So for innovative 'making' techniques we should start with the assumption that we will make it with as little effort as possible. This will force our imagination into directions which hopefully will lead to strategic breakthroughs in the way we do things.

To do this, you need to pick up from where you left off with mapping the mind.

What follows is an excerpt from Dr. Michael Teitelbaum's "How Not To Forget - The Ultimate Memory Improvement Training Program" www.memorysite.com/amazingbooks
<<http://www.memorysite.com/amazingbooks>>

Through a series of Emails some time ago Mike and I shared experiences and he summarized some of my successes to illustrate the power of the memory tools he describes in his excellent book and accompanying audio-cassette.

BREAKDOWN OF USES OF MAPPING FOR MEMORY, by Wayne Lundberg, CMfgE.

Uses:

1. Note taking in any classroom or seminar situation.
2. Capture brainstorming ideas in a manner which makes sense for later analysis.
3. Think of, organize and deliver a speech, a sermon, a presentation.
4. Invent something new. Strategic breakthrough thinking.
5. Problem solving alone or in a group

DON'T FORGET YOUR FOUR-COLORED PEN

Let's explore each use of Mapping for Memory in some detail.

1. Note taking in any classroom or seminar situation.

As a boy I discovered word and picture associations as a key tool in learning a new language and culture as well as for school. At seven I was taken to Mexico where from one day to the next I was immersed into a culture which made me feel as if I were a deaf, dumb and blind kid. I had to adapt fast or be left out. That move probably was the luckiest thing to occur in my life because I learned how to learn.

Later, in college, it amazed me how my fellow students would cram for exams while I would simply take the test, pass and go on to the next class and subject. I could not understand their panic and sleepless nights cramming for a test. Only later did I discover it was because they had not associated the

daily class material with the previous - had not built knowledge brick by brick and image by image. They had been taught to memorize things by rote and it was the only way they had for passing tests. Cram, take the test, forget.

I may not remember the exact dates of many significant historical events, but I can visualize the settings, the clothes, the art, the science of the time and put it pretty much where it should be through visualization.

THANKS TO COLUMBUS

If it's really important to know that on October 12 in the year of our Lord 1492 Columbus discovered America, I know where to look it up. But for creative thinking, problem solving, or analysis, it is sufficient to know it was shortly after the Arabs were pushed back across the Strait of Gibraltar - which in turn triggers images of Constantinople, Venice and France. So I have a compass to guide me through the mire. How could a person who memorized dates without assigning images to the date have this ability?

The trick is to listen to the instructor and convert the lecture into images exactly as you would script a movie. As the instructor exposes this new knowledge, you should put it into perspective and add details as if you were a movie scriptwriter or director imagining the scenes. When a scene is firmly in place with action, color, setting, actors - then name it. Write the name on your note paper under the last picture which would logically connect the new image.

THE BIG EXAMPLE

For example: Your lecture today is Maslow's hierarchy of human needs. Fundamental stuff for anybody going into business or leadership fields. As the instructor ticks off the five levels of human needs, most students will write the following:

- a) Food, clothing, shelter.
- b) Security, regular paycheck, insurance, Army, Navy.
- c) Society, sex, marriage, children, procreation.
- d) Esteem, the need to feel worthy and respected.
- e) Self actualization - when you know only God can see it.

In Mapping for Memory I would listen carefully, visualize a stage play with my ancestor beating a rabbit to death with a stick, lighting a fire, climbing a tree to protect himself from the jaguar, feeling all alone and wishing he had a playmate. I would see Jane in the next tree. They would talk, get together and make babies. They would find other families and join in a tribe to do the things most pleasing to this growing breed of bipeds.

Next would be the guy with the widest set of eyes who would be the most prolific hunter. The tribe congratulates him, gives him the best women, food and booze. He's the hero.

Then I'd see the author, way below the level of the stage, writing it all down as a historian. I put him there because his name is Maslow. He is low and because mas in Spanish means "more." I put him "more low" than the stage. It works for me because I happen also to speak Spanish. Whatever works for you - use it. Now I have connected a word with the author's name and with an in-mind movie. I will forever remember the five basic needs and the guy who discovered it all.

In my Mapping for Memory notes would be the hour's lecture in five balloons depicting the five major points. [I don't draw balloons well.]

Six months later, I would look at the page and in a few seconds the whole thing would come bouncing back in all its glory, into full view on my mental movie screen. Instant recall.

BRAINSTORMING IDEAS

2. Capture brainstorming ideas in a manner which makes sense for later analysis.

The other day I sat at a table with the CEO of a multi-million dollar a year company to discuss how he would set up a manufacturing facility in Tijuana and how he would work the financing with an English partner/customer/supplier. This potential partner needed assurances and some kind of agreement.

I took out my notebook, found a blank page, put the book horizontally in front of me and asked him to fill me in with background information.

As he told me about the English company, its history, and the history of the relationship between the CEO's company and the market, I drew green circles. I put the name of the CEO's company in one, drew a red line to the company in England, listed the market share of each, and so forth.

His concern revolved around how many shares he would have to give his English contact in exchange for funding the factory in Mexico. Pointing to words here, shapes there on my notebook page, which he had been following from the first moment, we connected a few items which he had not seen in his months-long analysis before the meeting.

He became excited. He began to think aloud as I continued putting names to pictures we created. From the drawings, he found an angle he had not seen before; one which would be a sure-fire motive for the English company to jump through the hoops to get on board this new venture.

The CEO would not let me out of his building until I let him photocopy the memory mapping notes. They are now being used to launch a new factory.

I can't fully explain the why without sounding like a pseudo-scientist, and instantly you would think of me as a charlatan. All I can say is that this technique works. Every time I have used Mapping for Memory when alone or with a client, things are discovered which should have been seen before. Simple things, obvious things, but they did not stand out until the mapping for memory exercise.

DELIVER THE GOODS

3. Think of, organize and deliver a speech, a sermon, a presentation.

It has been said that some people would rather die than deliver a speech. Would you rather wrestle a crocodile or give a speech at tomorrow's Quality meeting? Invariably the choice is to wrestle a crock.

Why?

It has to do with memory. People freeze when being stared at by a multitude of people. The thought of standing before a group can cause the mind to sink into total panic. All thoughts seem to fly out the window.

If you can learn to deliver a speech without reading it or without fumbling through a stack of cards, which seem always to get out of sequence, you are home free. Mapping for Memory is one of the

solutions to the deep freeze. It makes giving a talk so darned easy you will wonder why the world is not filled with speechmakers! It's really fun.

Even if you want to deliver a speech, but don't have the time to visualize a "stage play" or "movie," organize your speech in a traditional way. However, try starting with your paper placed horizontally before you, with the title of the speech in the center with a geometric shape drawn around it. You might double your mental capacity merely with that single act.

Any speech has a beginning, a middle and an end. The beginning usually describes the problem or opportunity. The middle develops the reasons why you will be giving the solution at the end. But it does not mean you have to start thinking and writing your speech in that order.

LOOK TO THE END

I always visualize the end result before doing anything else. To this end result I will build an argument. So on a memory map I will put the end result smack in the upper left corner where people traditionally start their note-taking. It's the first place the eye goes to - we've trained it to do. It's the first word on a piece of paper. It's item number one of a list. It's the headline.

I use the rest of the blank paper to build a series of picture shows so there will be no doubt in my audience's mind that the conclusion is logical and true.

I put a few words for each of these pictures somewhere on the map. Then I start connecting them and crosslinking them, looking for symbols, fewer words and more images, ways to communicate with emotion and feeling.

In my mind's eye I visualize the audience accepting my speech with applause, with them taking out their check-books, signing up for the next session, taking notes to share at work - whatever action I expect as the result of my effort.

When delivering the speech, all I need is a single piece of paper which I can hold, put on a lectern, or project through an overhead transparency. When I conduct a series of lectures to the same group, they eventually learn Mapping for Memory. When I place my own notes on the screen, they easily make it a joint venture of recall and discovery.

When it's all done, I can put the memory map away for an hour, a day, a week or years.

My lecture notebook is filled with mind maps of years ago which I can bring to life instantly with a few minutes of concentration. You see, mental images are like aromas. The faintest hint of baking bread can take us back to grama's kitchen filled with color, cats mew and all the rest. Words simply cannot compete against such awesome power.

INVENTION IS THE MOTHER OF SUCCESS

4. Invent something new. Strategic breakthrough thinking.

Huge companies, bastions of power, industrial giants - all crumble to nothing when they fail to react to changes in their markets.

An outstanding example of this may be when the Swiss watchmakers' research and development scientists told them about quartz. They and shrugged off the information. They didn't even care enough to patent the idea.

We've seen it happen to buggy-whip makers, titans of the slide rule, vacuum tube makers, the telegraph, nylon, memory chips, Apple. And we will continue to see it as we march toward the future.

Change is one the most difficult things to handle - or to accept.

DON'T MESS WITH THE GODS

Cassandra was blessed by Apollo with the ability to see the future, then punished by the same god when he ordered that no one should ever believe her.

People on the front line in many companies, schools, organizations see the change coming their way. They know the poo will hit the fan and they write memos, tell their boss, get newspapers to print their visions - but few people listen.

Time and time again we have seen that if the military top brass would have listened to the soldiers in the field, they would have had time to prepare, to change, to dominate that change and to continue the war.

Not one vacuum tube manufacturer ever got into making transistors. Some people think this a most unusual situation, but we know it happens frequently.

Andy Grove in his book "Only the Paranoid Survive" tells of his own blindness to the changing world and gives thanks to his plant managers and people in the field for having the guts to shift resources into microcomputers even before headquarters became aware of the changes taking place. This is an unusual story. It is unique.

BE THE INNOVATOR

In today's ever changing world those who can create strategic breakthroughs are the companies which will continue to grow, to survive, to provide increased wealth and well-being to country, customer and employee.

The student who can prove he has the tools to achieve strategic breakthroughs will never have to worry about not having a job. The person on a career path will be assured of having a brag sheet filled with examples of how he instigated major change resulting in huge profits or huge savings. That kind of resume gets jobs.

So what has strategic breakthrough thinking have to do with Mapping for Memory? Let's solve a problem.

PROBLEM SOLVING

5. Problem solving alone or in a group.

I was invited to meet with a director at Solar Turbines, a division of Caterpillar, to see if I had any ideas on solving a nasty problem which related to making jet engine combustors. The finished combustors had worked well for two years. Then, suddenly, they had gone out of control. Nearly every combustor failed to pass a burn-in test.

For six months their best people had tried to unravel the problem with no success. The problem was getting worse.

They put me to work to find the cause and a solution.

My first picture was that of a burning combustor.

For three days I went to every person who had anything to do with the combustor. I interviewed the original design team, the supervisors on the assembly line, the technicians at the test rig, and every one in-between. I took notes and questioned everything. It was easy to do after I told them I knew absolutely nothing about jet engines or combustors. Of course they wondered why the company would hire a person who didn't know the business. But that's what management does, and they shrugged it off and gave me the answers I needed.

The fourth and fifth days were Saturday and Sunday. I spent them walking about my garden, taking naps, jotting notes, dreaming, deep breathing and walking some more. I looked up every reference in my library on the subject, went back into thermodynamics, into some basic physics, and simply filled my brain with information. My notebook was filling with pictures and diagrams, yet I hadn't a clue.

I was putting a lot of pressure on memory as I kept visualizing the pictures and diagrams I had drawn.

Monday I was back at the test rig brainstorming with the technicians. I wanted to see a test, to feel the heat, to put my hand on the test device and feel the throbbing power of jet fuel being ignited making the power of a thousand horses flow through a small opening. I had to get inside the flame and be a part of it. I drew a picture of myself inside.

We talked some more.

On Tuesday I let my mind roam, to become a part of the fireball inside the combustor.

I could feel the inconel walls, the flow of air through the cooling vanes, the spray of jet fuel being ignited by the row of spark plugs, the blast of air coming in under pressure of the vanes, the super-hot exhaust gases nearly melting the power turbine blades (which was the problem).

I could see the temperature sensors at the outlet and could almost feel them near the point of melting and knew it was wrong, wrong, wrong.

A RUSH OF COLD AIR

From back in high school days, I then remembered myself under the hood of my car. I recalled the car engine as we crossed over high mountain passes and how it would overheat even in the cool air. Lean - it was running lean. I drew the car and a red line from it to the turbine blades. Were they running lean?

Back to the rig. I asked for the last reject to be put back for test. But first I requested they cover 20% of the front air inlet holes with something. Tack weld some shims or plug them somehow. They did it. We ran the test.

IT WORKS!

As the sensor temperatures appeared on the screen, we saw them in the normal range. When the final printout appeared, the unit had passed exactly in accordance to specifications. What had happened?

We now knew the fuel mixture was the cause of the problem but not the reason. Nothing in the manufacturing process had changed. I drew the holes, and it hit me like a ton of bricks. They had tightened the quality control on the size of the holes.

I went to engineering and asked how they had determined tolerances. They said the new laser was incapable of making close-tolerance holes, so they had run some formulas based on the randomness of the Yag laser drill, which cut by trepanning, and specified hole diameter accordingly.

I asked what would happen if every hole were made to plus or minus three thousandths instead of the actual capability of the laser, which was over five. They said the flow would be out of balance.

NEVER MESS WITH HOLES

That was it! When the first unit failed at test, the quality people measured holes against drawing specifications and found them to be all over the place. So they started reaming laser pierced holes. Which changed the design configuration. Which resulted in a fireball under greater front air pressure than it should be. Which made the fireball touch the rear vanes and caused the combustor to be a reject.

WHAT DID I DO?

Okay, let's see if you got all my thinking processes and all the scenes in the right order. Listen, think, research, analyze, test idea through imagination, press for inspiration, expect inspiration, test inspirational ideas, explore alternatives, test again if need be, develop hypothesis, validate, test again.

Throughout, I was drawing pictures, connecting lines, and visualizing the pictures in my mind.

Repeat process until I achieve success.

SO WHY THE MEMORY?

Where is memory in all of this long story? At all times, bits and pieces of information from a zillion places are in motion. Without being able to see how they interrelate through pictures, how they push and pull each other, there is simply no way to handle all the information.

In summary, Mapping for Memory not only betters your memory, it improves your thinking processes. It works in tandem or synergistically with the other memory methods set out in this book. It is an important tool for the solution of problems.

Footnotes:

1. Wayne Lundberg is a problem solver and inventor. Among his many inventions are a meatball making machine capable of putting a dozen one inch in diameter meatballs into cans of spaghetti at the rate of 36,000 per hour; a hand-held metal condition analyzer used to determine the material condition of sheet metal before it goes into the drop-hammer, which thus can predict the results; a six station rotary queue to automatically load and unload two-ton palletes of pre-assembled inconel components into and out of a vacuum brazing oven; and a self-contained shop built on barges and placed at strategic locations around the world for atepillar to deliver spare parts within 12 hours through the use of satellite transmitted CAD.