Learning and teaching using Crystal Maps

Crystal Mapping's ability to present information diagrammatically and to act as a graphic organiser enables it to be used practically and easily as a teaching and training device in any education or business environment. Presenting from a Crystal Map aids thought navigation and enhances the understanding process via spatial reasoning and pattern recognition as we have mentioned earlier. The process of creating a crystal map helps to stimulate creative thinking while still retaining a structured and (inductively) logical approach. With notes always visible when the cursor is moved around the map, crystal maps can contain and communicate far more information than many standard pictorial map presentations (for example line and flow diagrams and standard mind maps) thereby providing a more comprehensive teaching and training resource.

Its basic principle of delivering key pieces of information in an interdependent context, enhances the learning and particularly the recall process. Also, because many of us instinctively find that some form of visual representation of information makes it easier to learn, Crystal Mapping is a useful addition to the armoury of visual tools, aids and methods in any teaching arena.

Interestingly, only having the key aspects of any piece of information portrayed in a visually linked and holistic manner can also aid what Malcolm Gladwell in his book "Blink - the power of thinking without thinking", calls rapid cognition.

Rapid cognition is the unconscious ability we all have to jump to a conclusion based on some form of ill defined 'gut instinct' within a very short space of time. 'Blink' presents a compelling argument about what rapid cognition is and how it can be used by all of us to improve how we think and get through life successfully. His book is a rational explanation of this instinctive thinking process that most of us take for granted. Although Gladwell's book is far more wide reaching in scope than Crystal Mapping my instinct tells me that there is a connection between what Gladwell is saying and what Crystal Mapping is trying to do. If I'm right you'll get what I'm talking about using your rapid cognition!

In Gladwell's view it takes us about 2 seconds to make a snap judgement when presented with information, events or people. We do this by calling upon some hidden or unconscious memory, experience or general information association (often stereotyped) that lets us see through what might be staring us in the face and make a truly instinctive and in many cases correct but sometimes incorrect, judgment. You will undoubtedly have experienced some form of rapid cognition yourself most likely in your dealings with and reaction to people. For example there will be some people you just instinctively take a dislike to or feel somehow uncomfortable with but you can't quite put your finger on why. I guess we've all had experiences like this. I have learned to trust mine. One time I didn't it cost me dearly.

What happened was that I was so taken in by and convinced of an idea and a product that seemed to be so compelling that I completely allowed my instant negative reaction to the people involved to be overruled by my conscious logical thought process. Perhaps because 'I wanted' it to be a great opportunity I knowingly allowed myself to be hoodwinked into thinking that the idea was a 'no brainer' and that the people didn't matter. Now you might say this could have been down to gullibility or naivety or a bit of both, but whatever the reasons the fact remains that I overrode my instincts and paid the price, this time in hard earned cash. My initial and totally instinctive reaction to the people behind this project was overwhelmingly negative. In Gladwell's terms I had 'thin sliced' them and made a snap decision that they were not someone I should get involved with. I didn't feel that they were up to scratch in delivering on the promise – something just didn't ring true but I couldn't quite put my finger on it and I can clearly remember thinking this at the time of our first meeting.

With the benefit of hindsight I can now look back with a little more detachment but the fact remains that this is a prime example of rapid cognition – only this time I didn't act upon it!

So what has rapid cognition got to do with Crystal Mapping? Basically it is the idea that less is more. In the above example I allowed myself to be convinced of the soundness of my logical thinking at the expense of my instincts. I did this because I was presented with lots of information which clouded my first impressions which eventually lead me to the wrong conclusions. I would have been better served with less information – and formed my opinion based on my initial view. You could also say that I should have relied less on my optimism based on my wanting something to be true. In 'Blink' Gladwell talks of an episode where the J. Paul Getty museum wanted something to be true so much that it almost allowed itself to be duped into accepting a fake as the real thing. Which just goes to show how strong such feelings can be and how even the more worldly and sage of us can be overcome by them. Gladwell also shows us examples of how too much information is not necessarily a good thing when he talks about the changes made in Cook County Hospital triage process for possible heart attack patients. By introducing a simple triage process based on an assessment of only three 'urgent risk factors' to detect the likely prognosis of patients attending the hospital with chest pain rather than the time honoured experienced judgment of specialists the hospital improved its diagnosis success rate by a big margin. The conclusion being that you don't need much more than basic information to detect who was going to have a heart attack and doctors were simply attempting to call upon far too much experienced and nuanced information and data to no effect.

The point is that too much information can often create such a fog that it's impossible to see through it. By clearly stating and unifying the key points of any piece of information as you are forced to do in Crystal Mapping and by not drowning them in detail, it is far easier to see the bigger picture context from which to draw uncluttered conclusions. Of course if you want the detail it is all there but it is far better to get a view of the whole story and its 'leading characters' first before you dive into the detail. While Crystal Mapping is as much about communication as it is about thinking, thin slicing information to help digest meaning works well when we want to communicate simple messages from sometimes complex subjects.

For example we know of global warming and how it is perhaps the biggest single threat to continued human life on our planet and we are all probably more or less convinced that the threat is real and present. But as I said in an earlier chapter, I suspect whenever most of us think of the issue we tend to get drowned in the complexity and the sheer weight of the information available, much of it seeming to conflict, to the extent that we feel overwhelmed by the subject and uncertain of what to make of it and what conclusions or judgments to draw. What we need is some way to unlock the mystery and of seeing all the pertinent issues (leading characters in the story) and how they relate to each other so that we can feel more confident in our judgment and form a rounded view of the issue. Once we can see all the aspects to the story we can unconsciously start to form a thin sliced opinion. This is partly due to spatial reasoning and partly due to our innate ability to form order from chaos. Recalling the map in future will make you seem like an expert on the subject if only because you can state the key issues involved and how they are related. But just knowing the issues and having seen them displayed together will have given you insight into the bigger picture.

Of course many subjects require more detailed examination and Global Climate Change is one such subject, but once we have a starting point and a map to help us navigate the information we can start to absorb understanding. By adding notes to the map and cascading to more layers we can start to build real detail and full understanding. But the top level 'thin slice' is where we need to start on our journey of understanding.

Figure 21: Global warming crystal map

Visual learning

As we have said earlier, Crystal Mapping is a method of visual learning. Visual teaching and learning using information maps and graphical organisers of some sort is not a new theory. Some form of graphical organisation of ideas and information has been around for a long time. A quick glance at Wikipedia (**http://en.wikipedia.org**), whilst remembering that not everything you read on the internet is strictly factual and accurate, informs us that Porphyry of Tyros apparently used some form of graphical method to visualise and impart the concepts of Aristotle! However, it is really only since the 1960's when academic research started to become available that graphical organiser techniques have become widely accepted and used in education and training. Subsequent advances in technology have more recently started to make such systems fully integral to business and educational performance.

While there is a great deal of research in this field and many academics who have contributed to the subject, perhaps the two people who have most helped to popularise the concept of 'graphic organisers' in learning are Joseph Novak, who at Cornel University in the 1970's, developed Concept Mapping and Tony Buzan who we mentioned earlier, who developed the idea of mind mapping to what it is today. Both of these methods have strong claims to be the foundations upon which are based many of the software based graphical organiser / visual learning systems in use today.

In neuro linguistic programming there are three fundamental styles that are generally accepted as the basis for learning and understanding:

- Visual
- Auditory
- Kinaesthetic

In broad summary the visual thinker responds to visual stimuli such as pictures, maps and graphics and learns best from using graphics and illustrations. "If I can see it I can understand it" or so the theory goes. Visuals are thought to comprise about 35% of the population according to Bandler and Grinder the originators of neuro linguistic programming.

The auditory learner is more responsive to listening. He listens not just to the words but to the tone and pitch of what is being said and responds by trying to match the sounds he hears to a sound databank he has created from experience that enables him to translate meaning from the

words and how they are said. Auditory learners are reckoned to account for about 25% of the population.

Kinaesthetics feel their way through information. They react according to their gut instincts and emotions. They sometimes can't easily explain why they came to a particular decision on something other than it just did or didn't feel right. They rely on some inner emotional guide to determine what is right and what is wrong. Kinaesthetics account for around 40% of the population.

While we may all fit into one of these basic styles it does not mean that we are incapable of learning from any of the other styles. Regardless of our basic learning style, we use all of our innate senses to absorb, perceive, clarify and make sense of information. It is simply that many of us tend to favour one style over another – we see it, hear it, or feel it. It is this innate preference that dictates our dominant learning style not a disability to learn through other styles.

To add further detail to the above thinking on the three core visual, auditory and kinaesthetic learning styles, Professor Howard Gardner of Harvard University in his Theory of Multiple Intelligence suggests that there are up to nine different forms of intelligence. These are:

- Linguistic intelligence
- Logical Mathematical intelligence
- Spatial intelligence
- Body-Kinaesthetic intelligence
- Musical intelligence
- Interpersonal intelligence
- Intrapersonal intelligence
- Naturalist intelligence
- Existential intelligence

Visual learners have a high level of spatial intelligence which, as we discussed earlier, helps people to see and form bigger pictures from having information displayed in one field of view.

Given that a large slice of the western population has a dominant visual thinking bias and that spatial intelligence according to Gardner represents a specific ability that should be nurtured and accommodated, it makes sense for us to make sure we represent information in a way that reflects and encourages this type of learning.

There is one other reason why we should more often use visual information displays and graphic organisers to supplement our traditional linear text based delivery systems - boredom reduction! Motivation lies at the heart of all learning – the will to learn and the thirst to know and understand the world is, as we all know, a powerful if not the most

powerful driver in attaining knowledge. Crystal Maps along with all other types of graphic organiser should be used in a balanced manner within all aspects of education and business training to help maintain a high level of learner motivation. While content is always king, form has a significant role to play in engaging minds and motivating people to understanding.

Crystal Maps in Education

While many senior school students between the ages of 11 and 16 have a firm grasp and understanding of technology and could easily benefit from using Crystal Maps for project work and revision, Crystal Mapping is most appropriate in a higher education environment.

One of crystal mapping's prime uses is in providing a method of delivering higher education course material in an easy to see context. The following essay by Professor Martin Clarke of Leeds University exemplifies this approach.

The Case for Presenting in Context
Professor Martin Clarke

I began my academic career as a postgraduate in 1976. That was after 3 years as a geography undergraduate at the University of Leeds where teaching styles varied from the older lecturers giving lectures from notes with the minimum of visual devices to others who used the blackboard and some who had 35mm slides of peat bogs, Peruvian farmers, landslips and the like. It was only when I became an academic that I realised that I would now have to take part in this process of knowledge transfer by giving presentations at conferences and seminars, and also to students through lectures.

Interestingly, in those days, there was little if any advice given to academics on how to produce effective presentations. The only thing I can remember was being shown a video of how not to undertake a tutorial, a film that featured John Cleese (ex of Monty Python fame), who apparently made more money from his training company than he did from his TV appearances! Seeking advice from my colleagues suggested that the state of the art was to use an overhead projector along with hand drawn acetates. So I subscribed to this approach, producing reams of badly written but highly colourful slides. We used a sheet of paper to prevent the audience from seeing the slide in its entirety, the writing would smudge if you had sweaty fingers and inevitably you would spend ages putting the slides back into order. And then, of course, the bulb in the projector would fail and the whole performance was put in jeopardy.

With the advent of word processing and PCs in the mid 1980s we could dispense with the pens. Instead we produced our 'slides' on the PC, printed them out and then photocopied the results on to acetates. The slides were less colourful but probably more legible. This continued for several years until the advent of Microsoft PowerPoint around 1991. Now a treasure box of colour, graphical effects and animation was opened up, and certainly academics were seduced by the possibilities this provided. Never mind the content, conference presenters, lecturers, sales people and the like were more likely to be judged by the 'quality' of their slides than anything else. However, before the advent of PC projectors we still often had to print out our slides (in colour) and send them off to be photographed and turned into 35mm slides. Eventually, projectors became relatively ubiquitous, so we now plug our laptops into them and demonstrate our PowerPoint prowess to audiences of students, businessmen, colleagues and so on. Many companies have emerged that can help us with improving the attractiveness of our PowerPoint presentations and in many ways the outputs are very impressive.

I am not a fervent anti-PowerPoint person, I will leave that to others, like Edward Tufte, who are much more able of fighting that battle. I have, however, during the last decade been subject to 'death by PowerPoint' on more occasions than I can remember! To understand my discomfort with this as a tool for knowledge transfer it is worth me saying a little about my research interests that I have been pursuing for 30 years.

I am fundamentally interested in what is known as a 'systems theory' approach to understanding urban and regional systems. For example can we understand how accessibility to employment influences residential location decisions? To do this we have to understand the relationship between a large number of variables, income, household composition, car ownership, congestion, availability of public transport, house prices, schooling and so forth. In many academic subjects we are forced to try to reduce the complexity of the systems we study to make them tractable. This reductionist approach often leads to simplification and misunderstanding. To properly understand how systems might evolve or respond to stimuli (using the example above, the impact of, say, congestion charging) we have to embrace the inherent complexity of the subject matter we are dealing with. It is not an easy task and poses many challenges. One of these is to get other people (e.g. students) to think systematically about subjects they study, such as in my case, cities and their regions. To try to understand the impacts that global warming, fuel shortages, demographic change, economic development, terrorism, waste management and congestion have on the future evolution of cities is difficult enough in the first place but to get students to even think about these issues in a systematic way is very difficult. Everyone wants to simplify the processes and problems, so that increased CO2 emissions will naturally lead to an increase in temperatures in the UK, rising sea levels and so on. Those that understand the complex processes that are at work realise that it is not so simple!

When I was first introduced to Crystal Mapping I could see immediately how it could be used to address the problem of getting students to think in a systematic way. PowerPoint presentations, however well prepared, lead to a linear way of knowledge transfer, one slide after another, a serial process. For me Crystal Mapping allows the presenter to continuously remind the audience how things are related in a hierarchical and parallel way. So you can drill down and explore the detail of a particular entity or process but then zoom out again and see how that entity or process fits in to a bigger system. Like most good ideas it is both intuitive and simple. It doesn't provide an alternative to PowerPoint, it is instead a completely different way of structuring and presenting knowledge. Indeed it is perfectly possible to embed PowerPoint slides within the Crystal Mapping system.

By using Crystal Mapping software to make presentations to colleagues and clients they often express as much interest in the software than in my contents and several colleagues have been so enthused they have become users of the approach as well. In an era where the media and other forms of communication seem to want to dumb things down into simple packets of information Crystal Mapping helps embrace the inherent complexity of the world we live in and allows us to make sense of it and help others achieve this goal as well

Crystal Maps in Business Training

Crystal Mapping can be used in many ways to improve training outcomes within an organisation. From using the system as a delivery mechanism for sales training to using Crystal Mapping as a form of improved communication itself, its basic hierarchical design and presentational qualities make it a useful and practical method of delivering any type of training information. A good application is to use crystal mapping for induction training.

Induction Training

From the point of view of new starters the first imperative upon the company is to reduce the time it takes to get new people 'up and running' and productive. One way to help cut this non productive time is make sure new employees 'understand' the bigger company picture and how it all fits together. On the basis that the sooner a new starter feels that he fits in to the company the sooner he will start to be productive, it makes absolute sense to provide a bigger picture view of the company so that he can 'see' how he fits in and what is expected of him in relation to the objectives of the bigger team and organisation as a whole.

Today's job market as we have said earlier is comprised of workers who have torn up the old company / worker contract that committed the former to offering job security in return for employee loyalty. These days due to the lack of job security, employees and potential employees need to know far more about what they are getting into before they decide to put their loyalty and livelihood on the line for a possibly uncertain future. Given this new contract scenario (again, I'd refer you to Paul Turners book - Organisational Communication, The role of the HR Professional for a much deeper analysis), people need to understand what motivates the company and what makes it tick so that they can decide whether they want to stay for the ride or not.

Therefore, it is the job of employers to provide this information and do a much better job of making new starters and old hands alike, feel that they understand the bigger company picture and where they fit into the overall scheme of things. This goes right to the heart of my own beliefs about what makes good organisations great and is intrinsically linked to Crystal Mapping. If everyone truly feels part of the team and can see how they fit in, everyone will do a better job and the organisation will thrive.

So the old style of induction where a new starter was given a quick walk around (if lucky), a company handbook made up of basic HR information such as expenses policy, absenteeism and sickness policy and told to get on with it just won't wash anymore. They want to know how the organisation is structured not just by looking at an organisation chart but by really getting to grips with what the people in the org. chart boxes actually do, how they contribute to the whole and how they relate to them.

Crystal Mapping is an ideal resource for delivering bigger picture company information for use in induction and general organisational communication. All its core principles, context, unity and the

power of three can be brought to bear on creating the information resource in the first place and then in delivering it across the workforce.

As one Crystal Mapper puts it:

" As the owner of a small fabricating company, I am writing to express my extreme satisfaction with Crystal Mapping. As an element of my strategy for the past year, providing a method to improve communication with my employees was key. Part of the paradox of having a smaller number of employees (although large per capita production) is that one can form the mistaken impression that individual communication takes place everyday so the need for a central, integrated source of communication is not necessary. How far from the truth! Using a Crystal Map as the source for "total communication," all employees are informed and on the "same page." Through the use of a Crystal Map this has been accomplished in a short period of time. Because of a short learning curve, the ability to easily create, maintain and keep current a primary source of communication while having fun in the process is possible." (James S. Iams, Esq. President, Taylored Industries, Inc., Pittsburgh, Pennsylvania USA)

A second imperative incumbent on the organisation regarding induction training relates to the current legislative environment covering HR, social and working policy. Reducing the risk associated with employment is a major factor driving the training and HR functions in many of today's businesses. The increasing burden of employment legislation from health and safety accountability to anti discrimination and workplace harassment policy means that untrained or uninformed employees are a major risk and therefore cost to the companies employing them. Organisations need to ensure employees understand their rights and entitlements and have access to all required information. This is equally true not just for new employees but also for existing staff. A method of ensuring everyone understands these issues is critical for the company to keep employee risk to a minimum. Again Crystal Mapping provides a practical and easily deliverable solution.

As a general comment on delivering HR information in the form of a Crystal Map here is what Nicole Andrews, Managing Director of Carrot Consulting and an experienced big company practitioner has to say.

Making content come alive
Nicole Andrews

I have to begin with a confession. I love writing reports. In a career spanning 20 years, I have written hundreds of them, initially as a HR practitioner and latterly as a HR consultant. I research them beautifully. I take pride in drafting and re-drafting to produce exquisite clarity and depth. I present them with pride and confidence, anticipating the huge impact they will have on the audience.

However, in truth, I know that the vast majority end up gathering dust in someone's drawer. The initial impression may be good, and may indeed justify the effort exerted in producing the report – but over time, inevitably, the written word gets left behind. This isn't just true for reports. I've had the same experience with business plans, job description, resourcing plans, Employee Handbooks etc. People quickly move on and the detail gets left behind. As a "hands-on" Personnel Officer, in a big blue-chip company, I remember being inundated with queries which could easily have been solved by consulting the readily available information sources – the Policy Manuals, the Managers Guidebooks, the Employee intranet and so on.

So why is this? Perhaps it is the fast pace of business change. What's true today is unlikely to be true tomorrow. "Oh that was written before we started expanding overseas – it's meaningless now". Maybe it's linked to the new relatively short dwell time in senior roles. As soon as a new boss comes in, they want to commission a new report and the old stuff becomes redundant. Perhaps it's just that the average worker doesn't have the time, or indeed the inclination, to take an interest in anything that's beyond their immediate zone. By the time they have got through their " to do" list, there's no capacity for anything else; the "quick-fix" wins through.

Maybe it doesn't matter. Maybe the value is in the preparation of a report not in the final document. As long as a Company has a set of Employee Policies, does it matter if nobody outside the HR team looks at them? Perhaps it doesn't in some cases – but surely this is not true in all cases. There's a huge opportunity here to communicate differently and more effectively. The

challenge is to make the written word come alive – so that it carries a momentum and engages people way beyond the initial "first hit".

For me, this is what Crystal Mapping is all about. It offers the HR practitioner a new way of influencing and connecting with people. If you have something novel to say, why not attract people's attention by saying it in an innovative way? Otherwise they may be forgiven for assuming that you have nothing original to offer. To embrace Crystal Mapping you need first to break down your paradigms about how information should look. A Crystal Map won't fit neatly into an A4 folder and it challenges our own constraining assumptions about how to convey information and offers something radically different.

Let's think about the mapping analogy. If you were drawing a map, you'd want to help people navigate quickly to the places of most interest to them. They need to be able to do this, whilst still keeping their bearings and sense of scale. They'd need to be able to find their route easily, within the context of the overall plan.

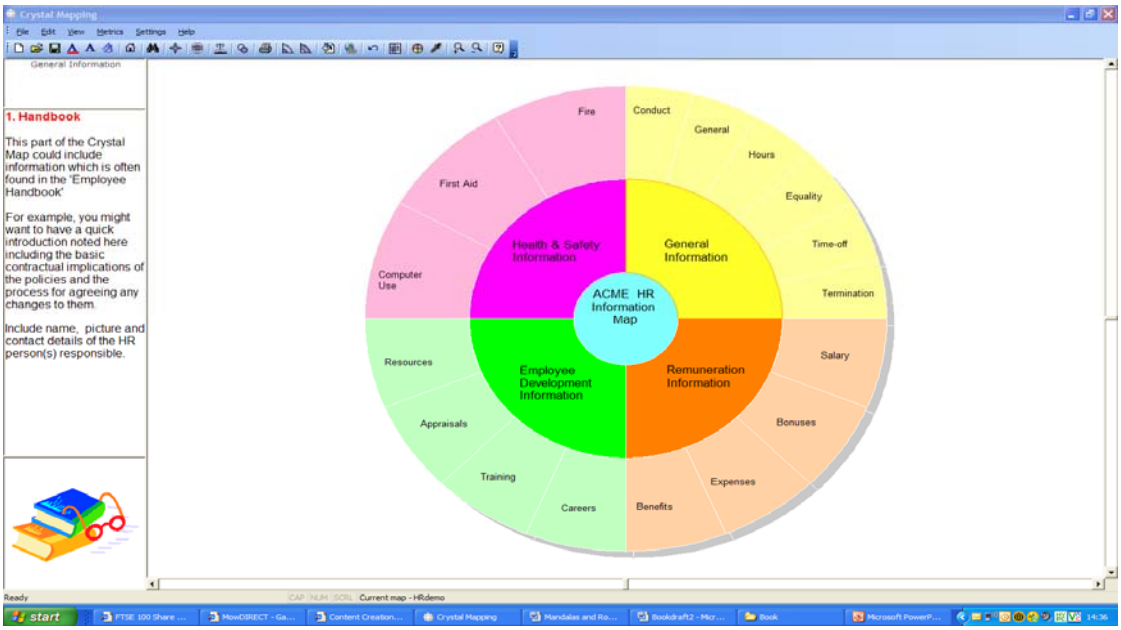
Maps rely on images rather than prose. Pictures and visuals can be more quickly assimilated and committed to memory than words. If you are trying to find your way somewhere for the first time, which works best – a visual representation of your route or a list of written instructions? It has to be the former, unless of course you have someone sitting next to you in the passenger seat reading out an instruction line by line as you go. (And we all know how unrealistic that is in business?).

Maps have boundaries, but they don't follow a linear progression – they don't have a beginning and an end. You can glance at them at any time and investigate a different place. You never finish reading a map. You re-visit it when you need to know something and it always leaves a print behind in your mind.

This is how Crystal Mapping works. It enables people to extract the information they need to know quickly, whilst keeping them in touch with the framework in which it belongs – the bigger picture. It gives ideas shape and form, showing how everything fits together and entices you to explore and re-visit.

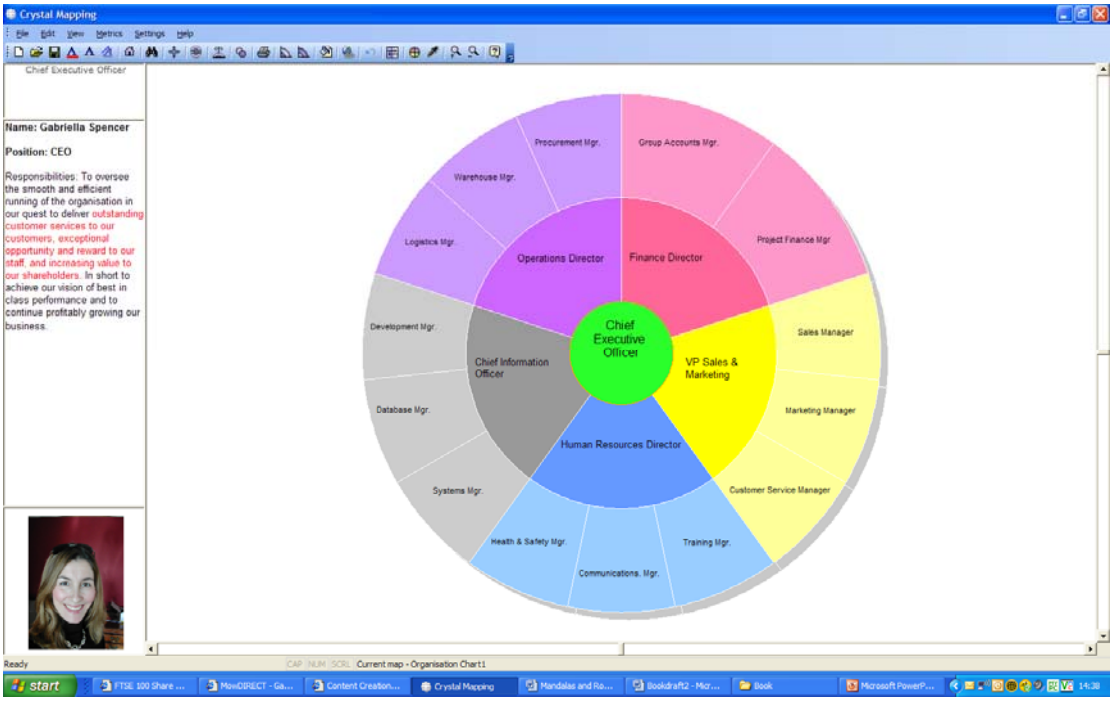
So perhaps there is, after all, a way to escape that seemingly inevitable "bottom drawer" death for that perfect report? A Crystal Map isn't conventional. An organisation chart or a set of performance targets conveyed via a Crystal Map won't look like any you have produced before. It will, however, give people a route to the information they seek, whilst always keeping in view the broader context. It will create an image rather than a set of words. People will remember what they see, they will want to go back and see more, and maybe, just maybe the content will come alive and stay alive.

Figure 22: Example HR Employee Policy crystal map



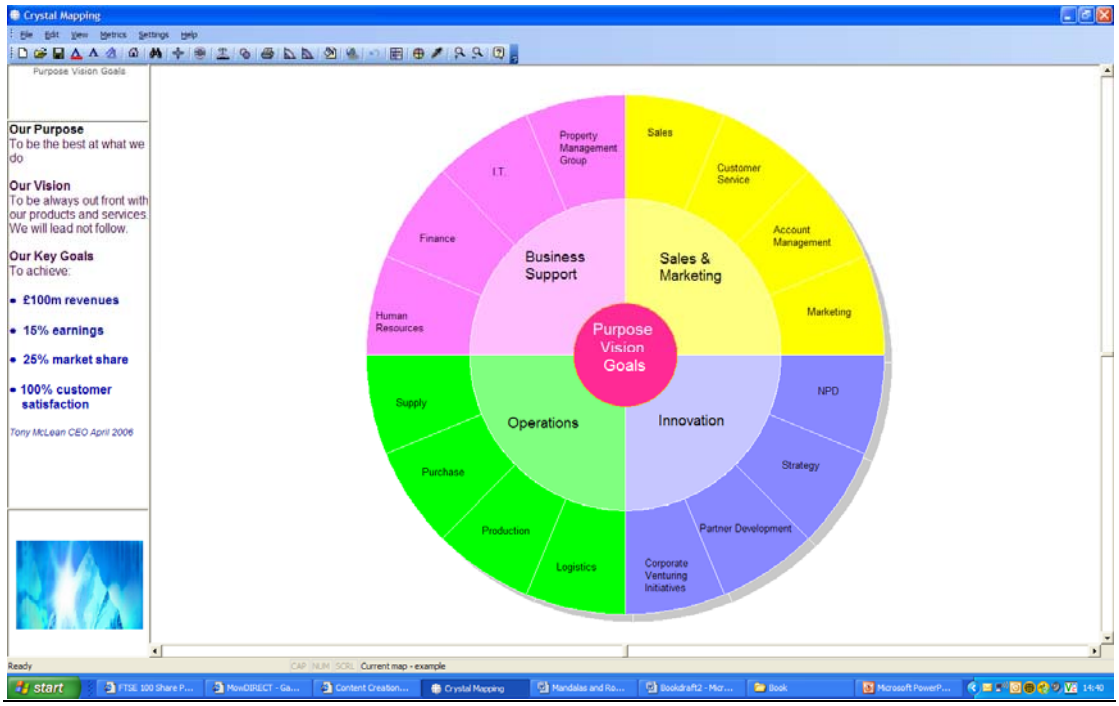
Having such an accessible HR policy 'handbook' such as the one above on your company's intranet or network will help all employees navigate their way around the world of HR and help you reduce risk. Having an organisational map such as the one below will help new starters in particular but everyone in general to understand the structure of the business and how they fit in.

Figure 23: Example Organisation



And finally having a Mission and Goals map will help to make sure they know how their individual efforts relate to the overall goals of the business. Just having these three maps which you can easily combine, opens up a whole world of bigger picture information to everyone in the team

Figure 24: Example Organisational goals map



Summary

Due to its highly visual nature and unified context, crystal mapping enables just about anything to be presented in a simple and easy to understand manner.