Hammers and Nails - Some Pragmatic Views of the Spatial Information Industry

Bruce DOUGLAS, Australia

SUMMARY

Spatial technology has been used by a number of government agencies for many years – but has it helped them meet their business goals, or has it been an over-rated and over-priced technology that has not delivered on promises of better management of assets, improvement in customer service and assistance to meet business goals.

In this technology-led industry, does a schism exist between users, particularly government, and technology providers? Have the major government agencies really embraced spatial technologies and achieved the benefits, or is the technology all just hyperbole.

This paper will draw on the author's recent book "Achieving Business Success with GIS", published by Wiley & Son, London as well as the results of Corporate GIS Consultants Spatial Best Practice Survey undertaken annually over the last 7 years with some startling results and in so doing, expose a few myths.

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One of the problems with the spatial information industry is that it is an industry promoted as an industry, generally focused on what it does rather than what it can or should do for the people who use this technology. That is, this industry is generally focused on the technology or the tools in the tool-box and in a lot of cases the GIS is used to solve problems whether it is needed or not. In a number of cases, this is referred to as "toys for the boys" – generally resulting in the GIS team encountering increasing difficulty in gaining funding approval, because senior management, in my experience at least, can see this happening and know that the focus is not appropriately on business issues. Consequently they reduce funding not increase it.

It is often mentioned that over 80% of all government business is spatial and that "location is everywhere" as the reasons why there needs to be an investment in this technology. But what does that actually mean? Doesn't this just mean that government writes a lot of correspondence which is posted using an address. At least for the last couple of centuries this is the way that it has worked, and this has been done without a GIS.

Is there a similar claim about the email industry and how over 80% of all government business is transacted by email. Or do we hear about the spreadsheet industry. No, of course not. Those technologies are just tools that everyone uses to get on with the job. But for some reason, most practioners in the spatial information industry seem to what to continually point out that spatial is special and those in control of the purse strings just "do not get it", otherwise "we would have lots of budget to do lots of really great things".

Indeed, in many recent conferences, much has been said about need for those in decision making positions to understand the importance of spatial systems and spatial data.

But the people that are saying this have often shown that they themselves do not understand the business application of spatial technologies and that they cannot explain it to senior management in a form that the executive will understand.

So there appears to be a schism:

- On one side, there are a lot of spatial practioners saying that the GIS tools in the tool-box are very good and if management embraced them, then there would be a lot of good results.

- And on the other side the management people ask why time is being wasted playing with toys which have little applicability to the business at hand – that is, what will it do for the business?

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In a number of presentations that I have made over recent years I have drawn on the results of our annual Spatial Best Practice Surveys to highlight that the majority of practitioners in the industry don't have a plan or a strategy for GIS and, of those that do, they don't communicate that plan in a fashion that is understood by those in management positions above them.

So on the one hand people in line management positions are saying "we need a GIS" but on the other hand they are unable to show senior management why that GIS is needed in terms that senior management can understand.

Part of the problem of course is that senior management receive a lot of requests to purchase software and other technology and unless there is a demonstrated business improvement that can be gained by spending this money, they are quite rightly reluctant to spend money which could be better used elsewhere.

To give you an example, recently I was asked to do a GIS Strategy for a very large utility in Australia. A year previously they had paid a major GIS Vendor to do a study to tell them whether they needed a GIS of not. Quite rightly, this might seem a bit like paying Dracula to do an audit of the Blood Bank or paying a used car salesman to provide advise on whether a car is needed. And of course the outcome was that the GIS vendor said that the organisation needed to buy a GIS and that their GIS was needed with all the bells and whistles. This was reported on page 2 of a 200 page report which then spent the remaining 198 pages discussing the benefits of their technology.

Of course this was all quite wrong and after a half million dollars later the company realised this and asked us, being independent consultants, to re-do the study, this time to focus on the business issues. Sure the GIS was probably needed, but it was just one of many problems that the utility had and the GIS did not fix any of the other issues. And it didn't need all the bells and whistles.

This was a bit like a supplier who has a toolbox containing a really good hammer, therefore all problems look like nails that could be fixed by this hammer. That is, no one was focusing on business issues or organisational issues, and because the vendor was so fixated on selling really great hammers, all the problems looked like nails. And because the vendor was a technology company, they saw all the problems as technology problems – they didn't understand business issues and because they believed all their own propaganda, they thought that the technology could solve the problem. Hammers and Nails again.

Of course, the approach by the vendor was totally wrong – sure they got a $1/2 million sale, but they missed the really big dollars that they could have made if they worked with the utility to participate in their business improvement journey, rather than just selling them a GIS. That is, they focused on the trees and didn't realise that they were standing in the middle of a potentially much larger forest. And that's OK for consultants like us, because the more that these type of vendors focus on their hammers without really trying to address the endemic issues in organisations, the more consultants like us are asked to rectify these problems.

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So the vendor got the $1/2m sale, the organisation got a GIS which did not address most of their business problems and senior management were left feeling "suckered" by a flawed process, all of which will make it that much more difficult for them to do anything which includes GIS in the future.

And this works against those who would say that spatial technologies are really important just because location is important. Email and Spreadsheet technologies are arguably more important than spatial technologies to the majority of business and government. But we don't have an "Email Industry" like we have a "Spatial Industry" – email is just a tool and we get on and use it. But it seems that because we have this really great hammer in our toolbox, called a GIS, then we regard everything as a problem that can be solved by this hammer, ie we look at most of the problems as if they are all nails.

Sure location is important. Location is known to represent a major component of government information, but this location is typically based on addresses. Addresses have been around long before GIS and are the primary tool that postal workers use to deliver mail and people use to visit friends and conduct business. Sure GIS can offer some good back room functions, but it is a fallacy to say that because an address is based on a location that therefore there must be a GIS involved in the process.

This is just hammers and nails again. Just because a really great hammer exists (ie a GIS) it doesn't mean that all problems have to be solved with them.

The key to getting the spatial correct in an organisation is to focus on the business and the information needed to support that business, rather than to focus on the technology just because it may be a great hammer.

In my book "Achieving Business Success with GIS", I talk about the need to develop an effective Business Focus and an Organisational Focus as integral components of developing an effective GIS Strategy.

Indeed, the methodology that we have developed over the last couple of decades is based around the following:
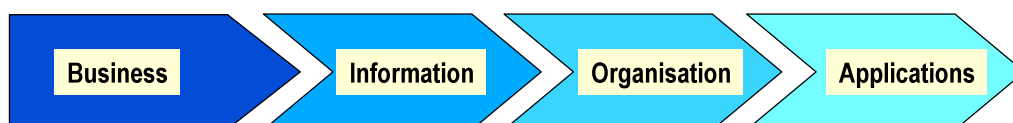
Any discussion on business drivers and the development of strategies to implement GIS systems should also include a section on organisational structure, since the structure of the organisation has the potential to severely constrain / impact the implementation of the technology-based strategy. This is particularly important for a GIS strategy which requires access to spatial data which is typically corporate in nature but held in is diversified locations across an organisation.

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Because GIS is "data-centric", it needs a considerable amount of data to be loaded in order for it to be able to function and provide information which is required to meet business objectives. This data is usually derived from a number of areas within an organisation and if the data is incorrect or poorly maintained, the decisions resulting from the use of this information will be less than satisfactory, and in some cases, may be quite erroneous.

Therefore access to data which is corporate in nature, but held by individual business units, is critical for any GIS strategy to be successful.

In all organisations, while the broad business directions and drivers are set "at the top", the "carrying-out" of those business directions is undertaken by "line managers", and as obvious as it seems, the nature of most business unit line Managers is to manage their business unit so that they meet their Key Performance Indicators (KPIs).

Therefore, a good business unit manager is most often primarily focused on his/her objectives and, in some cases, is not all that interested in assisting other business units to meet their objectives. This is exacerbated by competition between business units in some organisations, and "helping the opposition" is not always at the forefront of the mind of a successful manager.

An outcome of this undercurrent of competition between business units in large organisations is a tendency for line Managers to feel that "this is my data – I've collected it with my hard fought budget, we maintain it, so why should I give it to you". And then if they do provide it to other business units, or to the corporation as a whole, they often want something back in return, such as payment, increased budget, access to other capabilities etc, which are not always forthcoming.

In this manner, the structure of an organisation can help the GIS to be successful, or it can severely impede the progress of the GIS. As such, the structure of the organisation is absolutely crucial to whether the GIS will be successful or not.

If the organisational structure helps the GIS to access data which is corporate in nature, but "owned" by individual business units, then the GIS will have a higher chance of being successful. Conversely, if the organisational structure is such that accessing data (which is corporate in nature) is made difficult, then the GIS will almost always not be successful. And none of this has anything to do with technology.

While I don't want to go into a detailed discussion on organisational structures, suffice it to say that a good organisational structure is absolutely critical to the success of GIS. In addition, most research on organisational structures generally highlight that the focus of any good (organisational) structure should be "on outputs" rather than "on inputs" – a concept which I would readily endorse.

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Therefore, having said that a good organisational structure is absolutely critical to a good GIS, it might be useful to have a look at the business units of a typical organisation that might use GIS.

For example, an organisation might comprise the following business functions:

- – Operational Services
- – Corporate Governance
- – Finance
- – Engineering
- – Planning and Environment

If these business functions are appended with their major focus, it can be seen that there may be a possible potential conflict with implementing a GIS, ie:

–	Operational Services	→	output focused
–	Corporate Governance	←	input focused
–	Finance	←	input focused
–	Engineering	←	input focused
–	Planning and Environment	← →	input / output focused

Note that only two of these five business units are focused on the customer, the other three are focused on the work going into the process, not out of it. Therefore, the employees are "inward looking" rather than being "outward looking". Their focus is on the ingredients in the recipe, not whether the cake being cooked looks good or tastes good when eaten. And as any cook will tell you, anyone can put all the ingredients together in a bowl, but very few can make a cake taste really good. Therefore, just as the cooking should focus on "the cake" and not the ingredients, the business focus should be on "the business outputs" not the components which go to make up that business.

In organisations such as these, a customer with a question will be directed to Engineering if it is an engineering question, Planning and Environment if it is an environmental question etc. Not only is this confusing to the customer and confusing to the organisation, more importantly (from a GIS perspective), it means that Engineering have to keep engineering data; Planning and Environment have to keep environmental data etc, all in their own "silo's" and almost always not integrated and / or in conflict with one another.

A consequence of this type of structure is that it is difficult for a GIS to be effective because it will have to integrate data between different business units, and the biggest impediment to this happening will be the organisational structure, rather than the technical issues associated with the data or the technology.

Why is this important? For GIS to be effective in an organisation, it is generally used as a "corporate tool" – therefore requiring access to data held across the organisation, often from

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different business units. Therefore, for a GIS to be successfully implemented, considerable effort must be given to:

– the creation and/or capturing of the required data

– the maintenance of that data

– putting in place the organisational arrangements or structures which will support this concept and provide corporate access to the data and systems

This is also not helped by many large organisations and government agencies that continually reorganise their constituent departments in the search for better organisational structures to meet their changing business goals. This then results in work departments, or parts of departments, being split to join with other departments or sections from other departments, all of which makes it difficult to maintain access to changing organisational silo's.

Therefore, because organisational structures generally actively work against the successful implementation of a GIS, other arrangements have to be put in place in order to ensure that the GIS does get access to corporate data and can be used in a corporate manner.

An outcome that one could readily draw from this discussion is that in any GIS Strategy and Implementation:

– the technology (and GIS) issues are often "the easy bits"

– the organisational issues are generally "the hard bits"

This is because a lot of organisational structures often do not facilitate the easy integration of data (spatial and aspatial) across an organisation, which is absolutely essential for a spatial environment to be successful.

But because the spatial industry has a lot of really great and sexy looking tools, and because the industry is largely vendor-driven, a lot of people focus on the technology issues and forget about addressing the really "hard bits" that will make GIS successful. That is, the focus is on the hammers again with the assumption that everything else is a nail, whereas in fact this completely misses the point.

And this goes hand-in-hand with the other great misconception in most of the industry that there needs to be an "Internal Champion" within an organisation to promote the need for spatial technologies, otherwise it wont be accepted. This is often discussed in a manner suggesting that there is a need to "convince" the CEO or senior manager to make him or her understand how useful this technology really is.

I would argue that this is a wrong presumption and is indeed counter-productive to the successful implementation of spatial information environments.

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Spatial Information technologies need to stand on their "own two feet", so to speak in an economic sense, and be provable in a business case that it is required to meet a legitimate business purpose. That is, there must be a genuine business case for implementing spatial technologies otherwise this should be discarded as an option in any technology implementation.

That is, there needs to be a competent and provable Business Case built on a Cost/Benefit analysis and a Return on Investment strategy if spatial systems are to gain the acceptance of management and they must be able, as part of this process, to address and solve real business problems and issues.

And it's always easy to spot the novice in this process – they are usually the people talking about the need to have an internal champion or the need for the CEO to understand how this can be really useful, that is "we really need to convince him how great this is".

To that I'd say "sorry guys, you have the wrong focus". It's not relevant that the CEO has to understand how an internal combustion engine works just so that he can haul goods around in his truck. It's the job of the GIS Manager or Business Analyst to understand the business as viewed by the CEO and then to interpret the business requirements so that a plan can be developed and presented to the CEO in the business context that the CEO understands. Then, and only then, will he or she be able to appreciate how spatial technologies may help the business.

And to make matters worse, we have found that if there is an Internal Champion for Spatial in an organisation, they are often regarded by management as being on a "hobby-horse" and are often dismissed as being too one-eyed and having lost their objectivity, the outcome of which is that they are often not listened to. That's why if spatial really is useful for the business than it must stand on it "own two feet" and the only way to do that, in a business sense, is to make sure it has good returns for the business or operation.

As a CEO of a major electricity utility said to me recently "We have 3 major systems which are critical for our business. GIS is one of them. I don't need to know how it works but I do know why it is vital for our business. So it must operate 24/7."

So the question should be not that "we must have an internal champion" so that we can brainwash the Executive, but that "we must be able to prove that the GIS is financially beneficial in management speak" because ultimately all success in government and the private sector is measured by being able to undertake specific business processes in a financially effective manner, particularly in difficult financial times.

So how do we measure whether we have a "financially beneficial" spatial information environment – quite simply by doing a strategy which includes a Business Case and Return on Investment Analysis and presenting that in the language that a CEO or Departmental Secretary can understand.

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So why isn't this done more often? Because most people who manage Spatial Information Environments are technologists. That is, they focus on their really great hammer and either don't understand what they are doing in a business sense, or are unsure how their Spatial Information Environment will stack up financially, and so they wing it, often hoping that no one will notice.

Indeed our research shows that less than a ¼ of GIS implementations have a Strategy or Roadmap (that is less than a ¼ know where they are going) and, not unsurprisingly only 8% indicate that management understands what they are doing. As obvious as it seems, we would suggest that if they had a plan and communicated that plan to the organisation, then maybe others would know what they were doing.

In addition, only 13% have KPI's or goalposts for their spatial business. So is it any wonder that no one understands GIS Managers when they don't understand themselves.

In my experience, the senior executive of most organisations and government departments will eventually notice that the GIS Manager doesn't have a plan. So my advice would be that if you want to make sure that your Spatial Information Environments stacks up, then you need to get your house in order – find out if your Spatial Information Environments are cost-effective and make sure you have a business plan and a strategy – just like having a house plan so that the house you build actually stays standing and meets your long term needs.

And if your Spatial Information Environments is not financially viable, then work out what should be done to make it so, to make it more responsive to meet the needs of your stakeholders and to be more productive.

But in doing this you must adopt a position of financial prudence, that is, "tell it like it is" and not "blue-sky" the situation because ultimately senior executive are not silly – they will find out and you will suffer in the fallout process.

So in summary, the myth of saying "we need an internal champion" is not only just that – a myth – but it is actually worse, because it hides the need for a proper business plan and ROI analysis to be undertaken which will show the issues that need to be addressed, and it also propagates the "hammer and nails" misconception that because the industry has some really great technology, then all problems can be solved by using this technology.

Therefore there are two take-home messages that I would like to leave you with:

–   The first is that practioners in the spatial information industry need to stop focusing on the technology and start focusing on the business. That is, they need to stop playing with the tools in the tool-box and start looking at what they can deliver to the business that they are a part of. And just because they have this really great hammer, called a GIS, doesn't mean that every problem has to be solved with it. In some cases, the best solution may be to use other techniques to expedite a business process.

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– And the second point is that practioners in the spatial information industry need to stop focusing on the need to have an Internal Champion to make it successful. This is a wrong assumption and just avoids the need to have a solid business reason that the CEO or DG will understand as to why resources and budget should be put into spatial technologies. That is, focus on the business.

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BIOGRAPHICAL NOTES

Bruce Douglas is the founder and a Director of Corporate GIS Consultants, an independent Strategic Management consultancy in the Spatial Information Industry. He has worked as a consultant for the last 25 years specialising in developing business-based strategies for the spatial information industry where a high correlation of the technology to key business drivers is required.

Bruce is a Past President AND Director of the Geospatial Information and Technology Association (GITA) Australia & New Zealand and a past Federal Councilor of AURISA (now Spatial Sciences Institute).

Bruce has written a book "Achieving Business Success with GIS", published by Wiley & Son, London

CONTACTS
Bruce Douglas
Director, Corporate GIS Consultants
Sydney
Australia
Tel. +612 9709 3022
Fax. +612 9709 3055
Email: bruce.douglas@corp-gis.com.au
Web Site: http://www.corp-gis.com.au

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