Why KM is Hard To Do: Infrastructure, KM and Implementing Change

By Patrick Lambe

We recently did a small information management/knowledge management internal initiative at Straits Knowledge. The relative ease with which we did it, compared to the problems faced by several of our clients (much larger organisations) has got me pondering on the way that existing infrastructure impacts an organisation's current effectiveness, both positively and negatively.

On and off, I've been thinking about the effects of organisation infrastructure on organisation effectiveness for about five years. I'm also finishing a book right now on how taxonomies impact organisational effectiveness (Organizing Knowledge: Taxonomies, Knowledge and Organizational Effectiveness, Chandos 2006), and that brings me right up against taxonomy's role as an element of infrastructure.

By infrastructure I mean more than the "hard" IT infrastructure. It includes "soft" infrastructure like the web of explicit and implicit ways of doing things, policies and procedures, organisation structures, power balances and the availability of resources, the kinds of tools that are available, patterns of thinking and doing and collaborating. More than getting staff buy-in, leadership support, or adequate resources, infrastructure issues account (I firmly believe) for the biggest change management challenges facing KM implementations – because you can have all of the above, and still fail.

I guess I started thinking about infrastructure as a knowledge and effectiveness issue when I left my job working for a large, mature, global organisation with semi governmental status, where pre-existing infrastructure imposed immense friction on change and innovation (ie infrastructure manifested itself as bureaucracy and had a real cost in terms of limiting the capacity to change). I moved to a dot com startup where we had no infrastructure and where for a while, infrastructure was considered evil (because it inhibited flexibility in a tough market), but where eventually, we realised that without infrastructure we couldn't make money.

In the high infrastructure organisation I was a rebel, ready to dynamite the stifling infrastructure to fragments. In the no-infrastructure organisation I was a neo-conservative bureaucrat busy putting rules and standards and templates in place. Naturally I became curious as to why I exhibited such strangely opposing behaviours.

Put simply, infrastructure is what enables us not to have to keep reinventing the wheel every day, so we can channel your energies on

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innovating in new areas. This is what you can call "infrastructural capital" – ie it has a real commercial value. But it can also have a downside: if infrastructure grows too big and complex, it can inhibit innovation and change. More about this in a little while. First a little more detail on what "infrastructure" involves and why it's tough to deal with.

What is Infrastructure?

As knowledge managers, we are especially concerned with those bits of infrastructure that directly relate to the flow and use of knowledge and information. By knowledge and information infrastructure we mean all the things that combine to facilitate the flow of information and knowledge in support of the myriad tasks and actions and decisions that comprise organisational activity.

Hence, information infrastructure does not just mean the technical IT infrastructure, although it includes that. It also encompasses human, social and organisational elements. Within your information infrastructure you will normally find information management policies, process and practice routines, standards, arrays of tools and resources that are visible to their users, conventions and assumptions, shared vocabulary and categories (eg taxonomies).

Infrastructure is composite, integrated and intertwined, which means that one component can never be disentangled from the rest. It has grown historically, which means that any changes are always done on an already installed base, and will take time to "grow in". It has an overall maturity level, so that it will generally not easily accept elements that are discontinuous – "too advanced" or "too outdated" for its overall orientation.

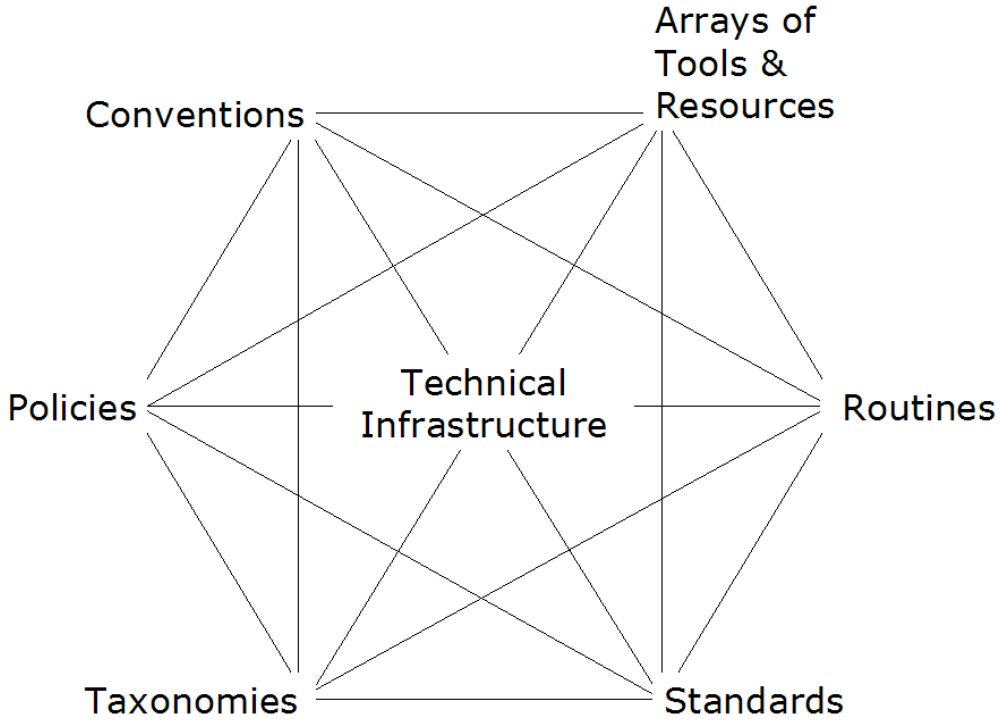
It is arranged for a wide variety of use, so is complex and complicated to manage. It is pragmatic, and since it balances many needs, it is always a product of negotiation. It's not uncommon for infrastructure to have incompatible elements facing off against each other. Infrastructure is always in uneasy equilibrium.

Most of all, infrastructure is taken for granted, and remains invisible unless it fails. It's like the colour scheme in our office which we are so used to, we simply don't notice it any more. In fact, failures and problems are often the only way we become conscious of infrastructure's impact on our effectiveness. Major inquiries into disasters such as the Challenger or Columbia space shuttle disasters, the 911 attacks in the USA, or inhouse disasters closer to home, will almost always focus at least as much on the way that systems and processes are failing to work, as on individuals and their mistakes.

This invisibility, together with the way that it is a complex interplay of elements built up and negotiated over time, makes it very easy to neglect,

but more importantly makes it very difficult to implement conscious, radical or rapid changes in infrastructure.

Infrastructure is like one jumbled mass comprising several tangled up balls of string: it's hard to figure out what's connected to what, where all the interdependencies are, and what we need to untangle and realign if we want to make a particular, significant change.



Some Elements of Information and Knowledge Infrastructure

The Value of Infrastructure

Now there's obviously a reason why human groups such as organisations make infrastructure. It's all about reusing effort, reducing thinking time and reducing costs. Let's take a wonderful example from Tim Harford's book *The Undercover Economist,* looking at larger scale infrastructures. We may think that a Starbucks barista knows how to make a cappuccino, but actually when we think about it, they only know how to bring together a number of ingredients into the final product. No one person can make a cappuccino from scratch.

"Who, after all, could boast of being able to grow, pick, roast and blend coffee, raise and milk cows, roll steel and mould plastics and assemble them into an espresso machine and, finally, shape ceramics into a cute mug? Your capuccino reflects the outcome of a system of staggering complexity. There isn't a single person in the world who could produce what it takes to make a cappuccino." (Harford, 2005 p.1-2)

So how do cappuccinos get made? In one word, infrastructure. In slightly more words, many, many, distributed, localised routines and components that contribute to a larger, purposeful activity and very regular, consistent

outcomes. And even though the big picture conspires to produce almost identical cappuccinos in all Starbucks outlets day in, day out, the mysterious thing is that infrastructure is not consciously managed at all, at the big picture level. Infrastructure is full of accidental, provisional, variant improvisations as well as regular routines, that somehow connect to their neighbouring routines, and somehow mysteriously conspire to produce remarkably consistent products all over the world.

There's no question that this is very powerful. It's also very valuable, because the effect of infrastructure is to reduce the cost of transactions and products to a marginal cost. The real value of infrastructure is the difference between what a can of Coke actually costs in the store and what it would cost to make it from scratch – including building aluminium smelters and growing sugar cane.

This is where the implications for knowledge management become obvious. Infrastructure creates this kind of value only by giving the capacity for information to move from one localised component to another, in some cases to propagate through the whole infrastructure system, and in many cases to allow the reuse of one piece of information or knowledge again and again and again – at marginal cost. All without the need to centrally manage or even think about the individual transactions that need to happen for that to occur. Think once, do many.

Now as we've seen from my earlier example, infrastructure can be effective (by increasing repeatability and reducing cost) or it can be ineffective because it inhibits change, innovation and adaptiveness (by being so complex and tangled and unconscious). How do you know which type you've got?

Well, it seems to me that the difference between effective and ineffective infrastructure is **regret**. Good infrastructure helps you avoid regret over:

- Major failures
- Negative margins
- Greater cost of transactions and products than competitors
- Mistakes, especially coordination and communication mistakes
- Missed opportunities

If you're feeling regretful or fearful (from a manager's perspective, fear is anticipated regret) about any of these things, then you have infrastructure issues to worry about.

Infrastructure and KM

So let's bring this down to the level of a KM project. Here are two of the key reasons why KM projects in large, mature organisations are so fiendishly difficult:

(a) KM projects touch infrastructure at many different points (people, culture, structures, roles and responsibilities, power, availability of

resources, established norms and routines, arrays of interconnected processes and workflows, historical negotiations, technical infrastructure and tools, pre-existing scripts and variant goals)

(b) such organisations usually have large, complex, especially tangled, inherited infrastructures to deal with, that nobody really comprehends.

We've been working this week with good friend and colleague James Robertson of Step Two Designs (www.steptwo.com.au), and at dinner the other evening he put the problem in a really interesting way (I'm paraphrasing from memory) :

"Here we are, we keep coming across clients, who have clear business problems and needs, they can identify their issues, and they know what they've got to do in general terms, but when it gets down to specifics, how to make a change, what to pay attention to first, which capabilities are required, which tools to deploy, things are much less clear. External consultants help with approaches and knowledge of good practices, but if the issue is internal capability, and if even the client can't see the full extent of their issues in practical ways they can address, what can we do to help them?"

James is describing all the main problems with infrastructure: its invisibility, its resistance to top down, planned "management", and hence the difficulty in breaking down goals into identifiable, do-able tasks with any confidence of success.

"Green Field" Infrastructure Projects

Now it so happens we at Straits Knowledge have also been doing a little internal knowledge and information infrastructure development of our own. Obviously we're very small, so by comparison with many larger organisations, it's been relatively easy. It struck me that it might be useful to figure out whether there were specific things that made our project easy, that we could apply to larger organisations that find it difficult. Some of these things are pretty obvious, but they are instructive nevertheless.

But first, a description of our internal project. Last year Straits Knowledge comprised two people. This year, we've grown to four, and we're doing more projects and bigger projects, several of them in parallel. We're also collaborating on projects with other specialist colleagues in Singapore and overseas (eg Maish Nichani, Marita Keenan, James Robertson, Gary Klein).

When we were two people, we were able to coordinate quite well with meetings and discussions. Now we are feeling the need for more infrastructure to keep us all on the same page: who's doing what, when, and how; how the different pieces fit together, how we accommodate changes to plans. We're also getting into a rhythm of using particular approaches and techniques and we need to stabilise those so that

whichever of us delivers them, delivers them consistently. All these things are classic deliverables of infrastructure.

We've already done a few things to enhance our infrastructure in support of these needs. We now have a wireless LAN in the office, with a shared drive for common documents. We've started writing project guides for regular tools and techniques, partly for internal guidance, and partly to help our clients prepare for different stages of the project, and manage their own internal stakeholder expectations.

In the past we had two static websites which we almost never had the time to keep updated: www.straitsknwoledge.com (corporate) and www.greenchameleon.com (my articles). There was no real synergy between them.

As various needs arose in our business, we had improvised by taking out a number of subscriptions, so by end 2005 we had a haphazard mix of different tools which were becoming unwieldy to manage and integrate: we had a weblog account with Typepad; some open source wiki software; an account with Constant Contact for contact management and newsletter communications; another with Basecamp to run web-based secure project spaces for collaboration and document sharing with clients on projects. This was all getting a bit messy to manage and keep track of.

So we sat down with our good friend Maish Nichani and tried to figure out how to simplify and integrate our infrastructure. He helped us redesign and link our two websites, and installed Expression Engine to manage them both. For the needs of a small enterprise, with not much time to give to infrastructure maintenance, this was all extremely user-friendly and affordable (ask Maish for a quotation www.pebbleroad.com !).

Inspired by our friends at www.anecdote.com.au and www.steptwo.com.au , we now have a shared blog placed as the centrepiece of how we present ourselves to the world, show our clients what we're thinking about, and test ideas with anyone who's interested. Sharing the blog has also turned out to be a really useful way of having slow, reflective internal conversations about what each of us is thinking about, that we would never otherwise have had in the daily rush of project work. The two sites are much more tightly linked, I think we project a stronger professional image, and keeping the site alive is a distributed, and easier task.

All this was phase 1 of our plan, the public-facing infrastructure. Our plans for phase 2 involve migrating from our various subscriptions to contact management, wikis, and project collaboration to an integrated inhouse service based on our website. We plan to run our contact management, secure project collaboration, wiki-based collaboration, research project data collection, image galleries, and much much more, off our Expression Engine software.

The only thing we haven't yet figured out is how to put our master project calendar onto the web: this is still occupying a huge, colour coded

whiteboard in our office. It changes all the time, so when we're travelling, any scheduling requests have to be called back into the office for checking and entry. Not very satisfactory. We want something that can give us a complete overview of our activity, but also filter down to filtered project specific views so that our clients can see only what concerns them, inside their own secure project spaces.

Now I said earlier this was relatively easy. It didn't *feel* easy to do phase 1 (and phase 2 will be more complex) because we had to do all this in the fringes of running full tilt at several projects. It probably took us four months to complete, where a couple of weeks' solid attention would have cracked it. But in comparison with most of our clients undertaking knowledge and information infrastructure initiatives, this was a walk in the park. Here's what helped:

- We had very few decision makers involved
- We had a very clear scope and defined deliverables (we don't have the luxury of time to consider our needs more than once a year, we have to get it right first time and run with it)
- We had minimal inherited baggage to deal with
- We had complete ownership of the timeline
- Our supplier (Maish) had an intimate understanding of our business needs (he's worked with us on several projects)
- What we didn't know internally, either Maish or Edgar (who has a wonderfully practical network of friends) were able to find out
- We remind each other to use the new processes and tools whenever we slip back into old habits
- We saw the results quickly, and got immediate feedback on how well it was working

"Overgrown Jungle" Infrastructure Projects

If we think about it, these are all the things that big, mature organisations handle much less well, and they are all functions of pre-existing infrastructure:

- Too many decisionmakers, focus is not maintained
- Lack of clarity about the scope and objectives because the needs are complex and the possibilities not well understood
- Lots of inherited baggage, lots of invisible dependencies
- Other factors such as budgeting, funding agencies, stakeholders, related projects, impact and pressure the timelines
- Long learning curves for external consultants and suppliers (even internal people don't understand the infrastructural frictions)
- A tendency to prefer slower, mechanical channels for information gathering, and a corresponding mistrust for personalised social networks
- Too few people who are committed to and aware of the project goals and who act as vigilant "wardens" of the change, reminding their peers on a day to day and localised work level

- Impact for stakeholders gets lost in the mechanical performance of project tasks

To change infrastructure, you have to negotiate infrastructure. The more you have, the harder it is to negotiate.

However, it strikes me that bigger organisations can learn from the relative nimbleness of small organisations like ours. The first step, obviously, is to acknowledge that infrastructure exists, and must be understood and negotiated. Beyond that, each of the areas we've discussed above, needs clear strategies to overcome the inherent friction that mature infrastructure provides.

Consult intensively, but keep decision-making simple: we need to make a clear distinction between the activity of *involving and consulting* stakeholders throughout an infrastructure project, as compared with *distributing and confusing* the decision-making responsibility. Consultation is critical, for obvious reasons, in anything that affects infrastructure, because your changes will impact lots of different work areas. However, after the initial needs analysis phase, the core project team needs a clear mandate and delegated authority to proceed with key operating decisions. Get the scope and objectives right, and any further consultation is more about validating detail than blowing the project in different directions every time stakeholders are brought in. This means strong leadership, a strong mandate, and constant effort to keep the project focused on its original goals.

Establish and maintain clarity of purpose: success in keeping the decision-making simple depends in part on clarity about project goals. If you have a strong set of goals that meet real business needs identified by your infrastructural stakeholders, then you have something that you can keep your team focused on, and remind your stakeholders of whenever you go back to them for validation or support. An approach with an evolving, provisional set of goals that emerges as the project team learns, might work in small-scale "guerrilla warfare" type projects, but it will not usually work in anything that needs to orchestrate and align changes at several points in an infrastructure. Get the purpose clear, link it to business needs, get your mandate tied to that purpose, keep the focus tight, and refuse distractions along the way.

Acknowledge the baggage: whether we like it or not, the inherited baggage, in the shape of existing tools and systems, work processes, leadership attitudes and experience, policies and priorities, previous project outcomes, will all conspire to slow us down. To ignore it is to gamble blindly on success, where a prudent eye will survey the ground and identify the most likely friction points well in advance. Choose the ones that will likely have most impact on your change, and involve the relevant stakeholders early on – whether or not you think your project will tread on their toes. Plan the necessary infrastructure changes at one step removed from your direct project, with those stakeholders. In military terms, don't just fight the enemy troops, disrupt their supply chains and communications as well. In gardening terms, have an eye to the whole

ecology of your garden, and your cultivation of individual plants will be much more successful.

Manage the timeline: it's rarely possible in large organisations to completely own the timeline of a project, because infrastructure is all about inter-linkages, dependencies, and distributed effort. However, timelines can be influenced by involving, again, timeline stakeholders, those who own the timelines that pressure your own. Notice how important it is with both baggage and timelines, to identify and map the most important stakeholders right at the beginning, engage them early, and communicate intensively with them, in order to influence their bits of infrastructure positively in your favour. This will require flexibility, and a modular as opposed to a monolithic approach to project scheduling.

Shorten and leverage learning curves: this is a tough challenge to meet, because tendering and procurement guidelines often force organisations to engage people who are strangers to them. If you can work with regular suppliers and service providers, all the better. If you can engage suppliers for extended durations during an infrastructure project, you get more leverage out of what they've learned about you. With new suppliers, it's terribly important to understand and provide for learning curves in your project planning. It's also terribly important to maintain your internal project team continuity throughout the lifetime of an infrastructure project, particularly at the decision-making and leadership level. I can't tell you how many projects I've seen fail simply because of leadership changes along the way. It's too many, and it's nothing to do with the competencies of the successor. It's about the infrastructural learning the core team has picked up along the way.

Use social networks: using informal networks both inside and outside the organisation can be a powerful mechanism to learn about what needs to be done, get your possibilities well defined, identify the technical knowledge you need to acquire, figure out the friction points in your infrastructure, and pick up tips and strategies from other organisations' experiences. Frankly, there's no earthly reason I can think of why this practice shouldn't be encouraged and acknowledged. You're not awarding contracts based on informal networks, you're learning. That's what informal networks are for. Use them.

Provide for habit-changing strategies: existing habits and routines are among the hardest bits of existing infrastructure to change. Not even persuasion helps, because habits and routines are largely unconscious. With the best will in the world in support of change, habits trump persuasion every step of the way. Cultivating and supporting a pool of change activists is one step you can take. You can make them more effective by identifying a few key, specific habitual behaviours that need to change for your infrastructure project to work, and running a campaign to change them, with your activists stationed as warders to give reminders and acknowledgements where they are needed. It's an old language teacher's trick: don't try to correct all the language errors a student makes, just correct one error a day, in the order that they need to build their language. We need to get granular and specific about where

habit change is needed, and tone down the preaching about "mindset change". Most of it is irrelevant.

Demonstrate impact to stakeholders: you will have engaged your stakeholders at numerous levels and numerous points in your project. As we've seen, you don't just need input from them, you need their collaboration so that they adjust and realign "their" bits of infrastructure in your favour. Because infrastructure projects frequently span years, you need to keep your stakeholders nourished, and show them benefits along the way. This goes back to the project objectives you establish at the beginning: this statement of purpose needs to be linked very closely to business benefits for them, and the benefits can't all be delivered right at the end. You'll need a programme of benefits. It's like a small business that needs to watch its cash-flow. You'll need to watch your "benefit flow".

Patrick Lambe, June 2006

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