Chapter 5: Bureaucracy and Treacle

Driving change in a carrier

Carriers have an image problem: they are widely perceived to be bureaucratic, slow-moving monoliths. The apocryphal sales pitch 'Buy from us, we suck less' (than our competitors) was attributed to an executive from a North American carrier. Sadly, only the better operators could plausibly claim that they perform to the level of 'sucking less'.

Senior telecoms executives share this perception. They see the organisations they are meant to be leading as opaque and unresponsive. Their failure to drive change often results in a regular turnover of senior, accountable staff. We used to joke that new CEOs were like the pilots of huge jets flying across the Atlantic. Everything is fine while the plane has to fly straight and level, but as it enters a region where it has to manoeuvre, the pilot discovers to his horror that the controls do not in fact connect to the aircraft.

All organisations have a tendency to bureaucratise. An organisation's ability to function is grounded in its processes, which should be independent of the idiosyncrasies of the people concerned. Good processes represent the intelligence of the organisation - it's often said that good processes are the way we get superior performance from average people. As organisations get bigger, processes solve the coordination problem between multiple agents across different times, geographies and skill sets. Processes are partially implemented in computer applications and telecoms networking: the rest comes down to people playing the roles the process stipulates.

Process normally evolve in a bottom-up and incremental way. Some new situation arises which the existing process cannot handle: the people most concerned fix it using the easiest means to hand. The way problems are solved in organisations is by way of projects - smaller projects are faster and easier to get approved than larger ones. So processes most often change by small fixes.

Like the similar evolution of software code, the result of years of incremental process maintenance is a heap of *process spaghetti*. Arcane rituals which make no sense to the outsider, obsolete methods which could easily be replaced by something much more efficient ('it ain't broke, so why fix it?' say the staff). When scaling a process, it is almost always easier and pleasanter to add some more people than to fundamentally improve the process and thereby disrupt things. It is in few people's interest ever to remove staff subsequently, which is why mature processes have a bloated headcount. Often there are so

many people involved in running processes that inter-process coordination becomes a significant internal problem, requiring the construction of further ‘meta-processes’: steering boards, coordination committees, internal public relations and communications staff, internal client managers. More headcount and further impediments to change in the resulting 'veto network'.

Being bureaucratic and immobile creates market unresponsiveness: the input-process-output loop grinds slowly due to internal friction. This looks to customers like stupidity, and opens a market opportunity to nimbler competitors who can give the market what it wants. This of course assumes the market is deregulated, and that the barriers to entry are not too severe. If competitive pressures matter to the bureaucratic organisation, it will respond to lost orders and falling revenues by reviewing its internal processes and attempting drastic surgery. At best, this *could* amount to major process-re-engineering, and new cycles of automation. A volatile commercial environment and the fear of competition keeps companies lean and responsive. As soon as the pressure is off, bureaucratisation starts again.

Telecoms market structure

The telecoms sector has not historically faced the levels of competition that other industries have experienced. During most of its first hundred years, telecoms was considered a natural monopoly and was regulated as a utility (regulation is not normally very effective in combating bureaucratisation).

When the telecoms sector was liberalised, the structure changed to an oligopoly. Oligopoly is a market structure where there are only a few players (2-8, typically 3-5) and significant barriers to entry. The players *could* set up a cartel, price-fix at the monopoly price and share the revenues, but in most countries this is illegal, and in any case there is a temptation to cheat and lower prices to win market share. This can lead to ruinous price wars which bankrupt the weaker players. Oligopolists prefer to implicitly collude on price and differentiate on other attributes such as service quality or product characteristics. If one of the players is significantly larger than the others, it can ‘punish’ weaker players by predatory pricing or even ‘dirty tricks’. As a result, the other players are often content to let the dominant player set the market price, and then to adopt their own non-threatening price and services strategies around it, simulating a competitive market. Because of the appearance of competition, regulators are often less aggressive towards oligopolies than they are to a clear monopoly supplier. The customer usually experiences an oligopolistic market as one with high prices and intense sales and marketing activity on secondary issues (e.g. complex price plans).

Telecoms suffers from two problems which make the pressures to bureaucratisation worse: *service stability* and *process-intensiveness*. These two problems unfortunately potentiate each other.

Service Stability

Many industries have to innovate or die. Products have a limited lifespan and are then replaced by something quite different. Product turnover churns the organisation and breaks up sedimented structures. But carriers are not like this. The chief product of carriers, and the one which still generates the bulk of their revenues, is the voice call - a product which has not changed substantially for the customer in more than 100 years, despite underlying technology changes. Other products have similar longevity. Once the transmission networks were digitised in the late 1960s, for example, it was possible to offer bit transport services. Apart from higher speeds and better reliability, these services have not changed fundamentally since then. Service stability means little outside pressure to change.

Process-Intensiveness

Process-intensiveness means that carriers depend upon a staggering number of routine and interlocked processes. Carriers are meant to be stable organisations, and with a conservative product set, they achieve this stability by a deep attachment to the processes they've got. Even discontinuous technology change such as the transition from analogue to digital switching, and from PDH to SDH transmission, left many processes unchanged.

This is true psychologically as well. Many carrier employees have a vocational sense of their jobs. Keeping the network going is a profound public service duty. When very senior managers present initiatives for change, often in very broad-brush terms, the reaction of many lower and middle managers is to interpret these as ill-informed, ignorant and sometimes malevolent initiatives whose only outcome will be to damage services. Their consequential defensive manoeuvres usually succeed. Senior executives talk of organisational immobility and sabotage.

How carriers responded to the Internet challenge

The reader may be puzzled as to how such conservative organisations responded to the challenge of the Internet in 1998-2002. Apparently they all succeeded in becoming IP companies, didn't they? The truth is somewhat different.

Carriers were aware in the late 1990s that the Internet was becoming a new market, and many of them set up divisions to carry Internet traffic. These new groups installed large enterprise routers, all that were

available at that time, which were usually connected into the carrier's ATM network as a provider of scalable bandwidth and inter-router virtual circuits for IP traffic engineering. The new Internet division did not impact any of the carrier's other divisions and processes, of course. The Internet division became the carrier's ISP, offering services such as dial-up internet access, email, web hosting and a portal. Staff often operated at arm's length from the regular divisions, dressed and ate differently, and worked unusual hours. They were tolerated by carrier management, and this toleration was met with disdain for 'the suits' in return.

As the Internet became a dominant force in the world, its impact gradually became existential for the carriers. Around the year 2000, at senior executive level, it was finally realised that Internet technologies, products and services were the future. This meant that the hitherto standard response to the Internet challenge - treating Internet platforms as yet another overlay network with an incremental set of products - was not acceptable for the future. This was not Frame Relay all over again. Instead a more profound scenario presented itself: that on a foreseeable time scale, most of the current carrier networks and services would vanish and would be replaced by new IP based networks and services. For the existing networks and services, the Internet was not simply an 'add', but a 'migrate and remove' as well.

Options for change

Senior executives faced two options for change:

- Create a new IP start-up with a new CEO, a distinctive management style, new processes, new IT systems and a network platform, new staff. Gradually transfer customers across, eventually shutting down the current business.
- Set up an internal programme to organically transition the organisation from its current set of products, processes and networks to the next-generation network, and *its* products and processes .

Based on the discussion on bureaucratisation above, it might be concluded that this is a 'no-brainer': only the first option, to create a new business, has a prayer of success. It is therefore interesting to discuss why almost every carrier nevertheless opted for the second approach, attempting to change organically.

Senior telecoms executives live in a world of projects and programmes, often large scale. They are used to spending significant amounts of capital on innovation. Most of the time, these programmes are additive, bringing new networks or products into being. Executives seem to have considered transition to

the new IP base - which was now being called the 'Next-Generation Network' - as a similar kind of project.

Executives at the VP and SVP level, owning major departments, had a career interest in participating in the creation of the NGN and could marshal some plausible arguments. The SVP for Product Management already had IP products and could argue that the process of migrating between 'old-wave' traditional products and 'new-wave' IP products (table 1) could best be carried out within one department, his own, rather than between two different companies. Network Engineering and Operations could similarly point out that issues of transmission equipment, space and power in equipment rooms, and many network operation systems were common between the old and new waves, so there was no benefit in splitting them. In addition, the complex customer migration from the old platforms was best handled within one unified organisation.

Old Wave product	**New Wave product**
Internet Access over IP/MPLS	Internet Access over IP/MPLS
BGP/MPLS VPN	BGP/MPLS VPN
IP Security	IP Security
Voice	Voice over IP
Call Centre	Contact Centre
Frame Relay/ATM VPN	FR/ATM over MPLS Virtual Private LAN Service BGP/MPLS or IPsec VPN
Leased Lines	TDM traffic over MPLS
Fibre, wavelengths, Ethernet	Fibre, wavelengths, Ethernet

Table 1. 'Old Wave' and corresponding 'New Wave' products

At the corporate level too, it was felt that close surveillance was required over both the present and future businesses. As the Internet boom faded in 2001-2, revenues were dropping away, CAPEX was becoming less available and the timing of the transition more problematic. With so many interest groups in favour of a 'business-as-usual' transition, and no real champion of change-via-spin-off, organic usually won. This partially explains why we have seen so little progress in transformation to date. However, if there *had* been such a champion, this is what he or she might have said.

"The SVPs have all made good arguments. Transition would indeed feel more comfortable and would be made administratively easier by being carried out within an existing management structure. The people are used to working with each other and have good lines of inter-departmental communications. Notice that another way of describing what I have just said is: 'The recommendation is to execute the transition using our current processes for managing change'.

"But our current change-management processes are *completely incapable* of the fundamental *process re-engineering* and *IT systems innovation* which is a prerequisite for success. The level of investment needed to create a new competitive business with modern processes, web-based customer and partner self-service, end-to-end flow-through automation, and IT application integration is just about imaginable. But the business case for such a root-and-branch transformation of the current, now legacy, organisation, would never fly.

"Instead, the legacy organisation should be locally optimised and run for cash. The new cannot fit into the interstices of the old. That is why the new IP services organisation must be separate, must make its own decisions without having to integrate with the legacy of the old. If we don't do this, essentially nothing will happen."

It is not quite accurate to say that nothing subsequently happened. As 2001 progressed and the Internet bubble collapsed, there was a dramatic cut-back in market demand, as customers slashed their IT budgets, and ceased their previously frenzied acquisition of leased lines, Internet VPNs and outsourced hosting platforms. Telecoms revenues fell away, and impelled by the need to cover operational costs and the enormous debt repayments on their capital expenditures for network build-out, companies engaged in fierce competition, forcing prices down to near short-run marginal cost levels, way below total costs. Bankruptcies followed.

The carrier stock response to cash flow problems is to cut costs, and many companies shed labour in brutal waves of redundancies. It was surprising to many people how many staff could exit a telecoms company with no apparent impact on services - in some cases they even improved. What was happening was that processes were being pruned of surplus staff by competent and informed lower to middle managers, who were getting blanket headcount targets and who used all their knowledge and creativity so as not to allow the company to fail. Clearing out the slack was everywhere a *local* optimisation since capital to fund major process re-engineering or IT platform regeneration was in short supply. Consequently, it did not move the NGN transition forward significantly.

As the industry recovered in 2004-5, the problems of transition to next-generation networking came back onto the agenda again. The carrier currently making the running is BT. Its '21st Century Network' programme (21CN) is the most ambitious programme of any carrier in the world at time of writing. BT might appear to be attempting the transition in the 'organic' fashion criticised above, but appearances can be deceptive.

BT has made an organisational separation between BT Wholesale, which runs its network platforms, and BT Retail and BT Global Services, which offer services to customers and which buy network resources from BT Wholesale across a regulated interface. The 21CN programme is within BT Wholesale. This insulates the transformation programme from the customer-facing process and system complexities in BT Retail and Global Services.

BT had already launched a major programme to modernise its Operations and Business Support Systems (BSS/OSS), moving away from its existing complex and monolithic proprietary applications to the world of standardised COTS (Commercial Off-The-Shelf) applications integrated by middleware. This provides a necessary precondition and driver for effective process re-engineering.

Finally, BT has committed to the programme very publicly at CEO level. Like publicly giving up smoking, such authoritative, senior and open commitment guarantees a powerful impetus for change.

It is too soon to judge 21CN, which will not complete its roll-out until almost 2010. The 21st Century Network programme is described in more detail in chapter 13, which includes an interview with BT's chief architect.

Transformation: how carriers fail

I now recount three case studies, based on my own personal experience, where carriers tried to solve real transformational problems based on their in-house culture of expertise and process - and failed. The failures are instructive.

New processes for a new network

In the late nineties I was technical architect of a major carrier network transformation programme, part of which involved migrating from the earlier PDH transmission, ('asynchronous' in North America), to SDH. PDH (Plesiochronous Digital Hierarchy - don't ask) and SDH (Synchronous Digital Hierarchy) are standards and technologies for carrying (multiplexing) many simultaneous voice and data connections onto high-speed links, usually fibre, and were discussed in chapter 2.

PDH was the earlier technology, usually deployed in a tree and branch configuration, with primitive instrumentation for monitoring and control. By the nineties, electronics and computing had advanced so that the new generation of more accurately timed SDH equipment could support automatic provisioning, failure detection and automatic recovery. Deployment was usually in rings: following a link or node failure, traffic was routed the other way round the ring. The new SDH network allowed far more automation of circuit management, both for circuits connecting the carrier's own voice and data switches and for leased-lines sold to customers, so clearly new processes were required.

I remember a meeting, where the urbane and civilised SVP in charge of Operations called his staff together to discuss how new processes could be designed and established to get the benefit of the state-of-the-art SDH network we were so expensively installing. There must have been at least 40 transmission middle managers in that large conference room. The SVP adopted a bottom-up facilitative management style, encouraging ideas, answers and solutions to come from the floor. Two hours later, after much opinionated turf-protecting and lack of engagement with the real issues (which hardly anyone at the meeting actually understood, anyway), a series of irrelevant action points were agreed for the next meeting. Subsequent meetings over a period of months predictably advanced matters not at all.

The change management procedure which actually solved the problem was to establish a separate group from scratch to take customer orders and provision SDH circuits. Roles allocated within this small group were designed to exploit the power of the new automation systems, creating a streamlined division of labour not possible with the existing primitive and mostly manual PDH processes.

Management lesson

When faced with discontinuous innovation, a bottom-up consensus-driven procedure based on the existing accountability holders, with little preparation or top-level direction, does not work.

Strategic transformation towards an IP services company

I was also, a little later in my career, privileged to watch the opposite management style. Detailed directives for change from a hard-driving visionary senior executive, given as specific action points to his subordinates. But his attention immediately returned to high-strategy: he was completely uninterested in the daily hard grind of programme execution and the need for continual oversight of problems and progress. Of course, none of his hapless subordinates were able to force change through their own sub-bureaucracies. Only a combination of ingenious excuses and the opportune arrival of numerous attention-diverting crises kept them safe. Finally the visionary executive was forced out by the greater failures of his organisation.

It has been popular in recent years to identify *execution* as the single most important factor in business success. The basis of execution, however, is to understand *what has to be done to prevent the existing bureaucracy subverting necessary change*. This is the *hardest* problem, but the visionary guy thought that exhortation would do it, and that the details could be delegated. This is an all-too-common response.

Management lesson

Management by vision and will-power alone is not enough. Supervision of execution is vital.

IT Outsourcing

One of my consultancy assignments was with a carrier which had outsourced its IT to a large systems organisation I will call Bravura. Under the new regime, Bravura was responsible for desktop support, server management, the IT roadmap, and transitioning the IT infrastructure towards the state of the art. In exchange, the carrier paid Bravura extremely large sums of money both on a rental basis, and for jobs done. When the deal had been agreed, most of the carrier's IT staff had moved across to Bravura as employees.

Why had the carrier done this? Around the time of the deal, it had been hard to miss the deep smiles of satisfaction on the faces of the COO and his colleagues. They had wrestled for years with intractable problems of IT service quality and modernisation. The only results had been regular service outages ('the

email is down again') and appalling service from what was euphemistically-termed the 'help desk'. The truth was, IT was out of control and unfixable, and now they had made it Bravura's problem.

The first change the carrier noted had nothing to do with IT service quality, it was the quality of the Bravura staff they were dealing with. While the deal was in play (and it was financially enormous) the COO had been dealing with Bravura's A-team. With the contract done-and-dusted, it seemed that the A-team had gone off to fight for other deals in other parts of the world, and that Bravura's post-sales B-team had arrived to actually do the outsource. It did not feel good.

Pre-contract, if you had an IT problem, for example ordering new PCs, fixing a desktop fault, or installing new applications, you would get onto the help desk, get a ticket number, and wait, ... , and wait. Under the new regime, the waiting was relatively unaffected, but you now had to fill in forms. Lots of them. Since Bravura charged for work done, everything had to be documented in detail, and then signed off both by carrier staff and by Bravura managers. IT-related activities slowed to a crawl while user dissatisfaction reached new highs.

The IT transformation part of the contract was likewise not in the healthiest state. Bravura had assigned a chief architect and team to its outsource organization. They had spent quite a bit of time, and of course money, preparing an IT roadmap and transition plan. I know, because I had the privilege of looking at it. But few of the carrier's staff seemed that interested: the document was merely motherhood and apple-pie. Bravura's architects had no access to senior business thinking within the carrier and had little to no idea of its business, product and network strategy. They also found it difficult to inventorise the enormously complex set of legacy applications and interfaces, many of which were undocumented and some of which ran on bootleg servers under people's desks. It was unsurprising that they had served up a bland, standard industry roadmap with no touch points to the carrier's IT reality at all.

After a few years of poor service, huge bills and IT immobility and endless legal wrangling the carrier managed to terminate its contract with Bravura and brought the whole mess in-house again. Where it remains.

Management lesson

- Don't outsource a mess.
- IT is a core competence for a carrier. Only outsource those functions which are clearly commodities.

On doing it right

My conclusions over the years have remained unchanged. Successful change management requires:

- A clear idea of what the objective actually is.
- Support from the most senior executives.
- A programme team with process re-engineering, architecture and design, and programme management expertise.
- The programme team must be full-time, and distinct from the line organisation.
- The programme team needs authorised touch points at all levels with the line organisation.

And most importantly, find exceptional people to fill the programme team roles, critically the senior positions. These points are explored more fully in chapter 7.

Reorganisation

It is traditional in discussing the problem of organisational change to talk about reorganisation, and to display the apt quote below, fallaciously attributed to the Roman satirist Petronius Arbiter, but apparently penned by a literate British soldier in Germany after the second world war, [1].

"We trained hard, but it seemed that every time we were beginning to form up into teams, we would be reorganised. I was to learn later in life that we tend to meet any new situation by reorganising; and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency, and demoralisation."

In fact I have found reorganisations, both useful and pointless, to be more of a feature of vendor organisations than carriers. Nortel used to cycle its global business structure every three to four years. Take an arbitrary point in the cycle where power was with the country and regional sales and marketing organisations. They had control of spending, and accountabilities for profit and loss, and they placed orders on the back-office product divisions. Over time, they would grow fat and comfortable, recruiting endless sales support staff and constructing lucrative private empires. SG&A costs would soar.

After a few years of this, Nortel would abolish the structure and would give control of marketing and sales to the product divisions. The switch guys would sell globally, as would the transmission guys, the data guys and the wireless guys. Marketing was separated out with only a thin overlay of corporate

strategic marketing. Account teams were in common, but were normally owned by the lead product division for that customer.

This cyclical reorganisation was always intensely controversial internally, but had the effect of smashing up empires and bureaucracies, and reducing overmanning. After three or four years of watching sales and marketing duplication emerge in the Line of Business model, with product division SG&A remorselessly increasing, Nortel would switch back to its original model, and lose another set of people and costs.

Carriers don't reorganise enough. The stability of their markets and products, already alluded to, seem to give them little incentive to change how they do their businesses. Individuals often get switched into and out of jobs, but the underlying structures and processes are unaffected - senior executives too often are 'in office, but not in power'.

For most of my career dealing with carriers, I was strongly of the opinion that that the answer was to break the carrier up into smaller, market-facing units with P&L responsibilities, where competitive pressures would counteract inefficiency and bureaucracy. Unfortunately the laws of economics are against such a strategy. Telecoms is all about economies of scale, and a naive cottage industry approach doesn't really work. But perhaps something similar does.

One of the most encouraging developments of the last few years has been the rise of the virtual operators. With the process-centric factory functions of running networks off their hands, they can organise around the principles of customer service, and the results are often exceptional. As the provision of network services continues to commoditise, an industry model which more sharply delineates between wholesalers and retailers can result in more efficient and competitive companies which each serve their specific customer types better. This is a future worth fighting for.

Summary

In this chapter we have looked at the problems of carrier bureaucratisation and resistance to change. This is partially due to the concentrated nature of the industry and partially due to the nature of the telecoms business itself. We then looked at the challenge of the Internet, and how two responses were possible: either to spin-off a new IP company, or to attempt an organic transition to the next-generation network. We discussed why almost every carrier decided upon the latter course.

We then looked at three failure scenarios: SDH process innovation, strategic redirection and IT outsourcing, and drew some lessons, and finally we looked at reorganization - often considered as wholly negative - and considered whether the problem might be that carriers don't in fact reorganise enough. Finally, it was suggested that the wholesale-retail split we already see with virtual operators may promise considerably improved operation and greater flexibility in the future.

Appendix 1: What do carriers actually do?

A friend of mine once told me that telecom operators are secretly delighted when the staff go on strike. Only about one job in ten in a carrier is actually dedicated to providing day-to-day operational service to customers. Operation is, in any case, pretty automated and middle managers, most of whom were promoted through the ranks, can usually step into any gaps. The operator saves a fortune in wage bills.

So what are the other nine out of ten people doing? Planning for the future, mostly, manning the functions shown in figure 1.

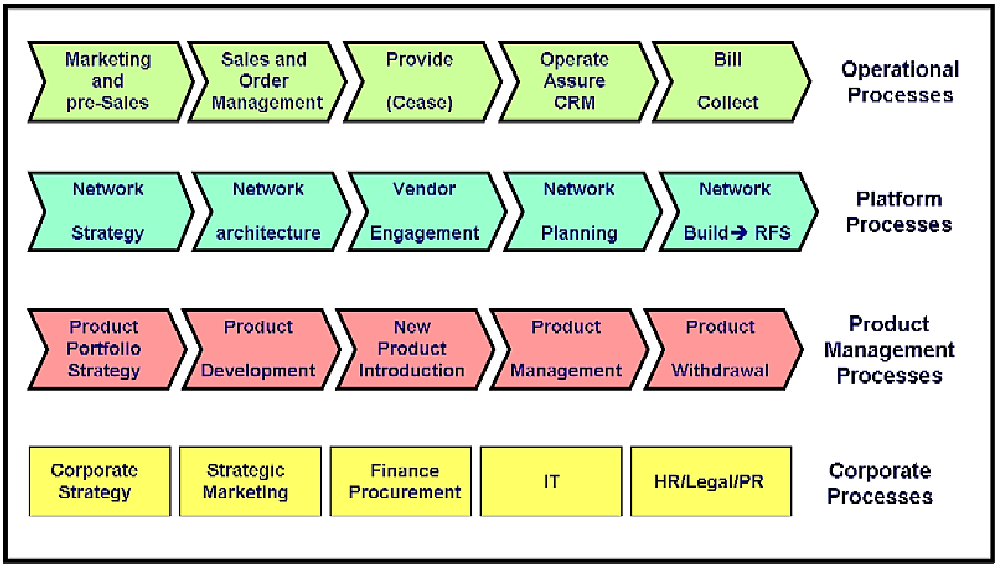

Figure 1. Telecoms Operator Processes

Operational Processes

This is what the customer - residential, corporate or fellow operator - sees. The carrier markets and sells its products, takes orders, provisions the service onto its network, operates the service, fixes faults, and bills the customer. Call centres for customer care are included here.

Platform Processes

The carrier's main asset is its network. As technology develops, there is a continual process of:

- identifying new technology opportunities (often suggested by vendors)
- developing a network and systems strategy
- designing an architecture appropriate for the carrier's network
- engaging with the vendors through RFIs, RFPs, RFQs (see below)
- running a procurement process for vendor selection (this is an *auction* - see chapter 10)
- finally planning the new platform or network in detail, and installing it.

Many of these functions can be carried out in partnership with a preferred vendor, or even outsourced to it through a longer-term frame agreement.

Product Management Processes

Products go through a lifecycle like anything else, and not all products are successful. There has to be a way of identifying new product possibilities, and of managing new products into service. Similarly, when a product's costs outweigh its revenues as it comes to the end of its life, there has to be a way of retiring the product and managing its remaining customers off the service, often by putting the price up prior to simply withdrawing the service.

Corporate Processes

These are the standard support functions: corporate strategy, strategic marketing, finance, procurement, HR, legal, PR and IT which are often organised centrally across the group.

Standard models of telecoms processes

Constructing carrier process models is not so easy - it amounts to defining a theory of carrier organisation. It is so difficult in fact that specialised consortia have come together to define best practice. Organisations such as the TeleManagement Forum (http://www.tmforum.org/) have developed complex models such as eTOM, the enhanced Telecom Operations Map®, to standardise carrier process models via layers of process abstraction.

In my experience, these are more talked about than actually used by executives who take charge of reorganisations.

Appendix 2: RFIs, RFPs and RFQs

When I first entered the telecoms industry I had been doing computer science research for most of the previous decade. I suddenly had to learn a whole new set of acronyms and processes. One area which was completely new to me was the intricate choreography between vendor and customer which orchestrates the sales process.

The process of engagement between a carrier and a vendor often starts with the carrier perceiving it has a problem. Perhaps it ought to do something about Video over IP, for example. If it genuinely wants to better understand the potential opportunity, it can solicit some free consultancy from potential vendors, by issuing an RFI (Request for Information). This document describes the carrier's perception of the problem or opportunity, and asks for information from the vendor as to how the vendor suggests the carrier might address it. The account team within the vendor organisation put together a task force and staff it with the appropriate expertise under a project manager to put the document together. Quite often a vendor has developed a new technology and thinks it would be interesting to the carrier, so makes an unsolicited bid. So carrier-pull is blended with vendor-push.

Once the carrier has a clearer idea of what it ought to want, the next stage is to assess the capabilities of different vendors' equipment. An RFP (Request for Product) is issued, and the carrier can compare the responses from different vendors.

As we get nearer an implementation project, the carrier invites vendors to bid for the business through an RFQ (Request for Quote). The response will describe the vendor's proposed solution, and include a commercial section detailing pricing. The collection of received RFQs, together with vendor presentations, serve to narrow the field down to a final short list. Then real commercial pressure is applied to negotiate prices down still further.

It would be quite unusual to see a closely coupled sequence of RFI-RFP-RFQ as part of a defined sales sequence because of the overheads involved and the overlap in content between the deliverables. What tends to happen in practice is that some part of the carrier organisation, often low in the hierarchy, is alerted to a new opportunity and issues an RFI to create a framework for discussion with their vendors. After the RFI process has completed, the issue then diffuses within the carrier and either dies, or accumulates momentum so that a tentative decision is made to do something in this area. An RFP or RFQ process is then launched in parallel with a business case being put together. For larger projects, a formal

RFQ process is the mechanism of choice for vendor selection. In the last lap, it's all about cutting deals and sometimes it's not very pretty.

References

[1]. Sullivan, J. P., *Petronian Society Newsletter*, Vol. 12, No. 1, p.5, May 1981.
http://www.dtc.umn.edu/~reedsj/petronius.html and
http://www.chss.montclair.edu/classics/petron/PSN1112.5.GIF.