The Management of Innovation: The innovator's perception

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Abstract: Much has been written about what innovation is, its purpose and how it is or should be managed. This paper investigates innovation from the bottom up, exploring the views and aspirations of a group of practitioners. Working with a publically funded research and development organisation, the researchers were engaged as consultants to investigate how innovative the organisation was and to consider how innovative it should be. To do this it was necessary to understand the perspective of the engineers, scientists and managers within the organisation.

Detailed structured interviews were conducted with four section managers and eleven of their staff. A widely accepted definition of innovation is "the successful exploitation of new ideas". To this, interviewees added "something new or novel" showing a closer attention to the "doing" of innovation and perhaps closer to a traditional definition of 'invention' than that of innovation above. Views varied across our sample. For some innovation = invention, science is key and specialist skills are all important. To others innovation takes on a broader meaning which can incorporate finding a solution to a client problem by changing the organisation's business model. This might include, for example, improving the capacity for project management while outsourcing scientific/technical activity to Universities or other providers.

The research findings focus on five aspects of the innovation environment. from which were formed four basic recommendations for an organisation that sets out to improve its innovation performance.

First, its internal information strategy must not impede the connections that innovators need to make, including the capture of knowledge, the sharing of ideas and the prevention of silos. The 'silo mentality' which is highlighted by some staff suggests a need for better internal communication and training in two areas. The first is in customer relationship management, and the second is in internal procedures and levels of confidentiality. There was evidence of unnecessary self restriction which could hamper innovation.

Secondly training can be used to develop specific skills particularly where the payback is recognised to be further into the future than for much regular training. Innovators were found to have substantially different training needs than other professional colleagues. The scope of supported training opportunities and flexibility in work direction clearly motivate staff. For professional training, greater use could be made of contracted training focussing on the differing professional needs where there is a mismatch in provision.

The third recommendation was that early innovators need to work with senior managers who understand their professional skills. In an academic environment, young researchers benefit from a subject expert who can steer the scientific content of their research. From the interviews, there is the impression that some new recruits to the organisation, working at a post doctoral level, would benefit from similar support within their discipline. Professional isolation inhibited those who could become resourceful and confident innovators.

The final recommendation is that senior managers need to identify and gain a consensus around what innovation means in their organisation and communicate this clearly to staff before it can become more innovative.

Keywords: Innovation; innovator; Management

Use of name "GOVTECH": In order to preserve the level of confidentiality for the subjects of this research and their work, in this paper we have given their organisation the pseudonym of GOVTECH. The authors would like to stress that this is an invented name. The name and the research reported here is in no way related to the real companies, Govtech Limited or Govtech Solutions Limited.

1. Introduction

Background

Much has been written about what innovation is, its purpose and how it is or should be managed. The more the focus moves to the management of innovation, the greater the risk of loosing sight of the actual practice of innovation. At its simplest level innovation can be thought of as "the successful exploitation of new ideas" (1) . This includes the exploitation of an existing idea in a new context. (2). Often innovation is rooted in a commercial environment and is seen specifically as "the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes, efficiency, effectiveness and quality" (3).

Innovation can also relate specifically to problem solving. Mulgan and Albury (3) bring the focus together by recognising that for any innovation to be successful, it must relate to its intended outcomes. If an organisation fails to determine its own relevant definition of innovation, it may often then confuse its staff by using a variety of performance

measures that obscure the key innovation drivers (3,4). To resolve that potential uncertainty, this paper investigates innovation from the bottom up, exploring the views and aspirations of a group of practitioners.

Working with a publically funded research and development organisation, the researchers were engaged as consultants to investigate how innovative the organisation was and to consider how innovative it should be, essentially was it maintaining a climate in which innovation could flourish. To do this it was necessary to understand the perspective of the engineers, scientists and managers within the organisation. Isaksen and Tidd (5) provide a useful perspective by citing six of the factors that have a bearing on the climate for innovation: trust and openness, challenge and involvement, support and space for ideas, conflict and debate, risk-taking and finally freedom. These factors are referenced throughout the findings.

This paper investigates innovation from the bottom up, exploring the views and aspirations of a group of practitioners. GOVTECH[1] is part of the machinery aimed at delivering UK Government objectives by supporting Ministers, the Chief Scientific Adviser and policy units.

The study allowed the investigating team to increase their understanding of the work of GOVTECH and its structure and to gain an insight into the management of innovation. Of particular interest were those aspects of management and organisation which may provide barriers to innovation, noting that Mulgan and Albury (3) call attention to innovation in the public sector in general being seen as "an optional extra or an added burden".

The paper continues by describing the research method adopted, then turns to the findings, first making some general comments about innovation at GOVTECH and then going on to explore findings through five aspects of organisational life: organisational culture; communication and knowledge management; management decision making; human resource management; and resources and facilities. In a concluding section we discuss the initial recommendations made to GOVTECH's senior management.

Research Method

The research team comprised Dr Keith Randle, Director of the Creative Industries Research and Consultancy Unit in the Business School and Dr Keith Bevis of the Faculty of Engineering and Information Science, both at the University of Hertfordshire. This was a consciously created cross disciplinary team with both an engineering/technology and a sociology/organisation studies background.

The contract with GOVTECH was for an initial scoping study, involving interviews with a sample of both senior and more junior staff from across the organization. In the event 15 staff were interviewed, including the four Sector Managers. Detailed structured interviews were conducted with four section managers and eleven of their staff. The

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sample was composed of 6 from SITE B and 9 from SITE A[1]. Interviews were around one hour long and took place with both members of the UH team present specifically to capture responses through the two contrasting lenses of technology and social science. Interviews were not recorded but detailed notes were taken. The analysis of these notes forms the empirical basis of this paper.

2. Findings

Innovation at Govtech

The research findings are based around five aspects of the innovative environment from which were formed four basic recommendations for an organisation that sets out to improve its innovative capacity.

The study at GOVTECH revealed that the idea of innovation as something new or novel linked the perceptions of most respondents, though these varied in focus and included:

- a new approach or way of doing things;
- a new piece of equipment or product, the application of existing knowledge or materials in a novel way,;
- invention, or the use of novel materials;
- A minority view was that "Innovation is coming up with new science that can be applied to one of our problems".

For most then, innovation at GOVTECH is not about invention, scientific study or the creation of new knowledge; rather it was about taking science and using it in a novel way to come up with answers to real customer problems and requirements.

Innovation does not have to take place in-house enacted by GOVTECH staff, it could involve bringing in outside contractors to work on site, or outsourcing the work. In a sense this is both an example of substantive innovation [the work carried out by the contractor leading to something new] and the process innovation [finding a new way of doing something – i.e. carrying out R&D activity] that some thought unlikely in the organisation. An example of an innovative way of working of this kind was the 'Vision Team' who produced 24 hours of video scenarios which were despatched to Universities and manufacturers to test against their products or technologies. The "translating", "brokering" or "intermediating" role of GOVTECH was seen by some as leading to innovation even if the work was sometimes done elsewhere "we don't just do research, we gear a lot of research".

Interviewees made many references to GOVTECH's 'broker' role, suggesting that the organisation acts as an intermediary between those organisations [e.g. Universities or commercial organisations] that supply knowledge or solutions and its clients. Some spoke of 'translating' the needs articulated by customers for University research

[1] GOVTECH has its staff located on two sites in the UK. The predominant technical expertise is different on each site.

departments and in turn translating potential solutions into operable solutions for customers. This role of interpretation, intermediation or translation means that rather than 'innovation' taking the form of hands-on scientific or technological development work, it may often be contracted out to a University Department or, alternatively an 'off the shelf' solution will be sourced from a manufacturer.

Most interviewees did identify positive aspects of GOVTECH which could lead to in-house innovation, suggesting that it was as innovative as work going on in Universities although it must be noted that this was also directly contradicted by some comments such as "the best work is going on in the Universities".

Mention was made of the existence of an 'Innovation Fund' for new ideas, there to support small projects. Another respondent commented that while getting over the barriers of gaining financial support for new projects might be difficult "once you have the money, its easy".

There was a strong belief among many of the longer standing staff that GOVTECH used to be a more innovative organisation. The type of work the organisation is doing has changed and for example, it was felt that innovation has been compromised where highly qualified scientific staff are occupied in writing standards and protocols. The universal use of new technology was seen as one barrier that has developed in more recent years and with one respondent commenting; "PCs have taken the spirit out of people".

Some felt that GOVTECH could continue to work as it did and that there was not necessarily a pressing need for innovation, but this was qualified by one interviewee who argued "You should always be able to win the last war". Because political horizons are short GOVTECH's customers are not good at looking ahead, furthermore they are largely policy makers and regarded by respondents as having no real understanding of science and technology. In some instances it was suggested there were complex technological issues that policymakers simply saw as database problems.

Among those that were critical of GOVTECH's innovation culture it was described as "not terribly innovative", "change resistant", "not a high energy environment" and less innovative than it used to be.

Respondents suggested a range of reason for this:

- GOVTECH *"is constrained by customer need"*
- *"You cannot innovate to order"*
- *"Only a small number of people are good practical inventors in house, good at bench science"*
- GOVTECH *"does not have a research culture"*
- *"Engineering support is spread too thinly"*
- *"it may be too expensive to develop new machines"* it can be cheaper to modify existing commercial products
- GOVTECH is not good at encouraging innovation for example it is *"difficult for more junior grades to put innovative ideas forward"*

- There are experts in some areas who can pour cold water on ideas coming from others that are in their discipline area, thus expertise can act as a barrier
- Innovation can be stifled by bureaucracy; it takes a great deal of commitment to get an idea over the various hurdles that exist.

There was wide agreement that GOVTECH is risk averse and risky new scientific work perceived as risky was not being funded. This was a source of concern for some who felt that there were less important problems that might seem more attractive such as optimising a process or making it safer. However an alternative perception was that with around 85 projects per year running across GOVTECH a degree of risk was taken and this had to be balanced by 'quick wins', which might come, for example, from off the peg solutions to problems.

There was some perception among respondents of risk avoidance, with it being hard to justify high risk projects. This was identified by some as being negative, with one respondent arguing; "Science is risky, its good to get something out that doesn't work". Others also felt some risks might be taken, pointing out that financial management of projects was good and well controlled, the risk being in not necessarily producing a workable solution. Seen altogether this balanced view of risk is very much in line with Bessant and Tidd's approach to risk (6) – the risk-taking indicator (5).

Related to the idea of 'risk averseness' is the suggestion that there is a tendency to 'cherry pick' problems which are easier to solve. While there were some difficult problems that needed solving, these more complex problems had been placed in the what one respondent referred to as 'the difficult to do pile'. Off the shelf solutions may be available to resolve easier problems.

There was some agreement that GOVTECH suffers from short-termism and to some extent this may be because political horizons are short. An example given was CCTV where a respondent felt that they should have seen ahead and developed standards.

There was further agreement that scientists would perceive the bulk of GOVTECH's work as not sufficiently interesting and there was too much routine "handle turning" or work on the development and specification of standards. Science was a key element in innovation for these interviewees, while others felt that the scientific method could be overplayed and that perhaps 15-20% was science, while 80% was project management".

There was also a degree of scepticism that GOVTECH was populated by innovative individuals, as one commented; "some people are good at it, some ideas are rubbish, others come up with a few ideas occasionally, others no ideas at all". Another view was that some parts of GOVTECH were more innovative than others. Yet another perspective suggests that the capacity for innovation is widespread but that there is a greater need to communicate the importance of innovation as an interviewee suggested "people can be innovative if they understand why they need to be" which chimes with Mulgan and Albury's view.

Interviewees did feel there were some things the organisation could do which might make it more innovative, for example getting people to use free time to think – Freedom (5). One respondent talked about how in a previous workplace the management had laid on sandwiches to get people along to meet each other but added the comment that at

GOVTECH the unions would not like the idea of lunchtime meetings. There was also some concern that administrative changes were too frequent and disrupted innovative work, and people should be allowed to consolidate and get accustomed to change.

Aspect 1. GOVTECH Culture

There is a perception that the two sites have different cultures; however both sites have been described as "very insular" and might benefit from joint project work. SITE A has been characterised as being funded by Head Office, whereas at SITE B funding tends to come more from clients, this leads to, for example, timesheets for each project.

The fact that staff have interaction with both users of solutions and experts in the form of Universities and manufacturers of products was seen as adding to work satisfaction. As one interviewee put it 'people see their work go from "cradle to grave".

Probably one of the most striking findings of the study was expressed in the phrase "making a difference" which came up in interviews, unprompted, time after time as in "you really get a chance to make a difference" or "You feel you are actually making a difference to people's lives". Eight out of fifteen interviewees, asked what is good about work at GOVTECH or why they stay, used the phrase in one form or another, with several others mentioning the opportunity to "do something which will help", "doing something useful", or "feeling like you're helping people". Clearly, this is regarded as rewarding work where there is reason and purpose and the degree to which there are shared goals and values articulated so universally, would be the envy of many commercial organisations.

Interviewees felt GOVTECH was a good place to work, mentioning in particular colleagues as well as shared goals, a good atmosphere, a pleasant physical environment, a high degree of team loyalty and supportiveness and a good personnel policies. Others mentioned the opportunity to work with different people and the variety of the work. Opportunities for development were regarded as very good. This can perhaps be summed up by one interviewee who described it as "A really privileged place to work" – the challenge and involvement indicator (5).

Among the more negative comments about work were that motivation was reduced by the barrier of bureaucracy that there is some laziness and over familiarity and that achievement was not acknowledged regularly enough, particularly through promotion.

Perceptions of degrees of [strategic] autonomy were mixed, with one respondent maintaining that staff would not be satisfied unless they "could do whatever they want". Others believed there should be a greater degree of autonomy by making space within the working week for furthering individual projects and the sense that perhaps this was not the case was strengthened by a comment by one interviewee that they would feel guilty if they read an academic paper at work and so tended to do it at weekends. This perception was balanced by others, usually more senior who felt that there was more freedom than was recognised, but you have to know how to manipulate it – the freedom indicator (5).

In terms of how the work was approached [operational autonomy] a greater freedom was acknowledged and one respondent commented; "The freedom is tremendous, a free reign

to develop programmes, freedom to approach commercial areas, commercial organisations will be open with information for us"

There was a perception that GOVTECH had been a better place to work in the past, more innovative with more communication across the organisation and more interaction between colleagues;

- "In *the early days we got together and threw ideas around a table it doesn't happen so much now"*.
- *"20 years ago there was cutting edge work going on"*.
- *"There was a culture of tea break discussion of science and this came up with answers"*.

However, this was not an entirely universal view, and at least one dissenting voice commented; "In the past we developed brilliant items that no-one wanted, but the pendulum may be swinging back the other way, some of the freer thinking may come back".

This generated a great deal of comment. Overall there was a significant volume of negative comment about procedures;

- *"All staff spend a lot more of their time on bureaucracy and they resent it"*.
- *"Processes are barriers [to innovation], paperwork and signing off"*.
- *"We all have to measure performance, this cuts into the time for work, pendulum has swung too far"*.

Others acknowledged that there was a need for control and that procedures for justifying projects were required but that perhaps they were too stringent;

- *"Procedures are very tightly laid down, we spend a lot of time filling in purchase orders or making business cases. We don't have time to sit back and attach solutions to problems"*.

Yet others accepted the need for bureaucracy and felt that perhaps some staff simply lacked the skills or experience to know how to deal with it;

- *"There is a lot of necessary bureaucracy, we are spending public money. Some are good at writing business case others find it difficult.'*

The climate within the organisation was described positively particularly in terms of relationships between colleagues and the extent of available help and support, good training and development opportunities and the absence of a blame culture. In contrast one respondent described GOVTECH as "a friendly place, but getting less friendly".

Aspect 2. Communication and Knowledge Management

Some respondents referred to a 'silo' mentality within GOVTECH, with insular teams 'stovepiped' limiting any innovative "Culture Space" where ideas flow in a more open organisation (7). Consequently some communication took the form of rumour about the

work of other teams and while solutions to this, such as the creation of 'cross cutting groups', were seen as an attempt to overcome this barrier there was a suggestion that these did not meet frequently enough and were not open enough. It is unclear whether this is related to issues around secrecy/security, but others confirmed that, as one put it; "We find out on a 'need to know' basis".

Relationships with customers formed a significant part of our discussions and it was clear that many GOVTECH staff have a close working relationship with their clients, in the sense of having much direct contact. The fact that the service provided by the organisation is free to a number of clients can be both a source of satisfaction and frustration. Respondents spoke of pressure from customers who wanted work done within very short timescales. Relationships with customers are often informal and more relaxed than they might normally be expected to be in a commercial contract and they are prone to changing the specification for work mid contract.

The perception of customers, spread out as they are across a number of government departments and agencies, vary considerably. Not all customers were forward looking nor well financed, but perceptions of customers ranged from "the nicest people, looking for new technologies", through "touchy with big problems" to "appalling". The UK Government itself, "the mother organisation" was "the most important customer".

The existence of "Cross-cutting groups" was not spoken about very highly by respondents. They were regarded by some as ineffective, irregular, or not relevant to their area of work and we were told that there was an understanding that Senior Management had been advised to disband them. Against this there was a suggestion that the IT CCG has worked well, not in prompting innovation but in establishing needed standards across the sites – conflict and debate indicator (5).

Informal talks on aspects of science and technology had been introduced to encourage communication. Experience was mixed and views consequently were also mixed. On balance it was clear that these could be regarded overall as a success. Interviewees commented on the wide range of subjects discussed and the fact that they were open to all.

On the downside was the fact that these were mainly run at SITE A and while video links has helped, people were less inclined to attend at SITE B. Another criticism was that while the talks were good because they brought people together the subjects were rather generic rather than focussed on the particular issues faced by GOVTECH and were therefore not directly relevant.

Respondents informed us that there was no formal Knowledge Management System at GOVTECH, neither does there seem to be any movement in this direction. Some were unimpressed by KMS in general, others highlighted the difficulties involved with developing such a system for example, While communication about what work was going on across the organisation was important, it was felt that there was no easy of prescribed solution for doing so. In terms of maintaining the organisational memory, one respondent suggested that it may be possible to retrieve reports on work that had been carried out in perhaps the past 5-8 years but beyond this is would become more problematic.

The existing customer relationships probably make GOVTECH unique as a research organisation. The 'silo mentality' which is highlighted by some staff and easy classification of customer style suggests a need for better internal communication and training in two areas. The first is in customer relationship management. GOVTECH is driven by customer requirement, but could benefit from staff being better equipped to handle a range of customers. The second is in internal procedures and levels of confidentiality. There was evidence of unnecessary self restriction which could hamper innovation – trust and openness indicator (5).

A particular weakness is in the area of knowledge management. Both the lack of a formal knowledge management database and the declining pool of experienced tacit knowledge featured in the interview comments

Aspect 3. Human Resource Management Issues

There is a choice of flexible or standard hours working and we have gained the impression that most employees choose to work under the flexitime system. The organisation was felt to be reasonably 'family friendly'.

Interviewees responded very positively to questions about access to training and development referring to "incredibly good opportunities" and the "opportunity to train on almost anything" including MSc's and part-time PhD's. One interviewee described a high level of support while engaged on an MSc, which included financial support, study leave, and help from colleagues.

Professional training was viewed more equivocally with the suggestion that much of the training on offer was geared towards more mainstream UK Government staff who do not do work similar to that at GOVTECH. Some of this training was regarded as very trivial and it was felt that there was a mechanistic attitude to demonstrating that training was taking place described as "a tick box mentality - we can demonstrate training is happening, not that it is the right training, useful, at the right level, what is needed". There was some suggestion that a standard training programme was needed for GOVTECH staff, one which recognised that things change quickly and become out of date.

One interviewee referred to there having been considerable expansion but commented that induction was now less comprehensive than it had been in the past.

There was some concern that new recruits were being brought into the organisation with unrealistic expectations and that this could lead to problems and a higher than desirable turnover. Some mention was made of the need to manage expectations. Turnover among scientific grades was understood or perceived to be average or reasonable, although one respondent was of the opinion that "people are leaving at the moment".

We detected a concern that techniques used in selection were not altogether appropriate to the needs some interviewees felt that the organisation had. Selection was considered to be based on the qualifications of applicants, plus competence based interviews, however these techniques were not seen as able to identify creative thinkers. The Assessment Centres used by GOVTECH are obliged respondents said to use the same system as non-scientific departments within the UK Government. The example was

given of the previous Director only taking on 1st class graduates, but who still had difficulty getting through the assessment centre. A concern was that people selected through this system would leave more often.

Comments on pay and financial incentives at GOVTECH ranged between "pay is ok, but not great" to "pay is a huge demotivator". There is an understanding that there are some non-financial incentives available and that it is also possible for a 'spot bonus' to be given out on the say so of the Director. But also a feeling that recognition for good work is often slow in coming and that good performance needs greater re-enforcement, PRP was not felt to support innovation.

Appraisal was described as "too delivery focussed" and "a blunt tool"

Assessment centres were designed to assess competences, especially technical, aimed at finding all-rounders, good scientific skills, Project Management and technical skills, but Project Management was see as the most important thing

Questions around the existence of skills within GOVTECH led to responses referring to the talent of the staff and level of science excellence within the organisation. However, there was also a feeling that more recently promoted people tended to be those with business skills and that business acumen was now highly valued by the organisation.

There was also some suggestion that qualifications alone were insufficient to ensure a high level contribution and that 'thinkers' were needed, as well as experience, "a new graduate is worse than useless" was one comment.

There was some concern that technical achievement had not been recognised historically as a route for promotion" and that perhaps there should be separate technical and general career streams. Among younger staff there was more openness to the idea that a move out of GOVTECH may be necessary to build a career, perhaps with a move to a more central London based department.

Although bundled together here, these issues range across the role of staff, their career progression and their mid career training opportunities. The scope of supported training opportunities and flexibility in work direction clearly motivate staff. It is in the professional training where there is a mismatch in provision.

Aspect 4. Management Decision Making

There was a belief that management at GOVTECH was risk averse and in terms of new projects lower risk pieces of work would be supported. One explanation for this was that the scoring system may work against high risk projects, although another more senior interviewee explained that by breaking down a project into bits it was possible to minimise risk and therefore, presumably, avoid being constrained by this consideration.

There was considerable criticism of the decision making process around gaining financial support for projects. One aspect of this was the timescale involved and decision making was felt to be slow partly because getting senior managers together is difficult. Another aspect was what was seen as a somewhat opaque system of project approval. There are Project Approval Boards that consider applications for funding and also a Project Appeals Board, however one concern was that although an idea might be good people were not always able to present proposals well enough to get approval from these bodies or it was difficult for staff to justify projects. This was seen as somewhat heavy handed in

GOVTECH's environment where one interviewee commented; "we are vote funded, [CEO] can take risks and approve funding for projects internally, this would not the case if the client was paying".

We were informed that GOVTECH has a strategic plan which is reviewed every two years. However, the need to remain reactive in the event of unanticipated events means that internal plans can easily be displaced.

Management of projects appears to figure heavily in GOVTECH's work and this is perceived to have become more the case recently. PM skills were described as "not so good" and the perception now is that it is that Project Management is now all important. However, there was some criticism of this emphasis, as what was needed, it was felt, was a more light touch system. Heavy duty PM was not appropriate and PM qualifications were not seen as particularly important at GOVTECH. One respondent considered that PM is just about "managing a little job, it is not professional PM, its all about science". The emphasis on having a project management focus "has reduced professional skills development" and specialist skills were more important.

Collaborating to innovate appears to be an important aspect of GOVTECH's work, with a wide range of joint endeavours with other government departments, commercial organisations and University academics, including a number of international partnerships. GOVTECH's role in this case is to ensure that others deliver against project plan. One interviewee commented that this type of work was encouraged and that "line managers are good at getting staff out to meet customers, universities etc" and we were told that in the one sector 14 projects were external and 6 in-house. We are aware of at least one initiative where GOVTECH is developing a call for proposals which will be targeted towards Universities and commercial organisations – Openness (5).

Across the organisation there is a confused view of project management. For some there is an over emphasis on project management that gets in the way of science and innovation. For others it is a tool to expand GOVTECH's capability by leveraging in external expertise.

Lack of clarity about the decision making process reduces effectiveness. Again training and communication are key to improvement.

The need for a rapid response to customer dilemmas has an unsettling effect on resourcing. This would seem to be a question of the loading on Staff and resources.

Aspect 5. Resources and Facilities

Interviewees had qualified views about the facilities available on site which can perhaps be summed up by the comment that they were; "good but not world class" in particular the sharing of labs was criticised, so labs were "good generally, but shared labs are not". There was also a sense that the availability of facilities was uneven across the organisation, so that "some have great facilities" while "I have no laboratory and it's not for lack of screaming and shouting". More negative comments included; "The labs are in a mess, no one takes ownership", "There is not enough storage" and "The labs are 'quaint', one little chemistry lab, therefore how much research can take place?"

Staff resources were acknowledged to be thinly stretched across a large and diverse range of projects and there was more potential work than could ever be done with 200 people.

In addition time pressures for completion of projects meant that sometimes staff were too busy to talk to other people about their work.

There were some issues around the development of expertise. One interviewee commented on the fact that recruits were very bright with Oxbridge PhD's being common, but that they did not get the support they would have experienced at University, at GOVTECH they are 'the expert' and this was not something all were comfortable with. The nature of the expertise required, it was felt, was that it could not easily be 'bought in' and it could not be developed quickly, consequently it had to be 'home grown' over a period of time. Furthermore, individuals with special expertise used to be able to work with different sectors when the organisation was smaller, but now that it has grown a more central support system may be needed.

There was a perception that finance for projects was becoming tighter and that this was constraining the work that could be done. However, another perspective was that it was the management of finance that was becoming tighter and that this was not necessarily a problem. More positively one view was that availability of funding for "trials that are tangential lateral thinking" meant that "some of the free thinking may come back" – support and space for ideas indicator (5).

Resourcing is a good example of where there are widely differing views about allocation and exclusivity, although for the most part the allocation of resources was seen as fair. Having some limited funding for speculative work begins to break the straitjacket on innovative effort but better communication about its availability and training for staff to engage with would help.

3. Conclusions

This pilot study reveals a number of conflicting views among respondents and while a wider study is required to explore these in more depth some initial findings have been reported and tentative conclusions can be drawn.

Many CEOs could only dream of the level of dedication found among the staff who took part in this scoping study, the majority of whom insist that a key motivation for working at GOVTECH is the opportunity to "make a difference". However, that strong ethos is balanced by frustration with bureaucracy and a sense of declining achievement.

Benefits here could be squandered if new ways of overcoming bureaucracy, rewarding staff for achievement and supporting their career development are not introduced.

A widely accepted definition of innovation is "the successful exploitation of new ideas". To this interviewees at GOVTECH added "something new or novel" showing a closer attention to the "doing" of innovation and perhaps closer to a traditional definition of 'invention' than that of innovation above. Views varied across our sample. For some innovation = invention, science is key and specialist skills are all important. To others innovation takes on a broader meaning which can incorporate finding a solution to a client problem by changing the organisation's business model. This might include, for example, improving the capacity for project management while outsourcing scientific/technical activity to Universities or other providers.

There were good examples of innovation taking place and good leverage derived from the translation of customer needs to external research objectives. This must be seen in the context of a sense among staff of declining poor innovative performance.

The pilot study suggested four key issues for management.

First, its internal information strategy must not impede the connections that innovators need to make, including the capture of knowledge, the sharing of ideas and the prevention of silos. The 'silo mentality', together with evidence of unnecessary self restriction and inappropriate levels of confidentiality could hamper innovation. There is no space for the diffusion of ideas, a vital part of Boisot's C-Space (7).

Secondly training can be used to develop specific skills particularly where the payback is recognised to be further into the future than for much regular Civil Service training. Innovators were found to have substantially different training needs than other professional colleagues. The scope of supported training opportunities and flexibility in work direction clearly motivate staff. Just like commercial businesses, the learning process enables the organisation to innovate more effectively (8,9). For professional training, greater use could be made of externally contracted training that would focus on the differing professional needs and counteract the existing mismatch in provision.

Thirdly younger staff need to work with senior managers who understand their professional skills. In an academic environment, young researchers benefit from a subject expert who can steer the scientific content of their research. From the interviews, there is the impression that some new recruits to the organisation, working at a post doctoral level, would benefit from similar support within their discipline. Professional isolation inhibited those who could become resourceful and confident innovators and in some instances led younger staff to move elsewhere. Studies of informal mentoring have shown that mentors can facilitate the development of these talented researchers and at the same time, the organization gains stronger connections among its members (10).

The six indicators preferred by Isaksen and Tidd (5) have appeared at various points in the discussion demonstrating the appropriateness of the interviews to determining whether GOVTECH is fostering an innovative climate. To move forward senior managers need to identify and gain a consensus around what innovation means in their organisation and communicate this clearly to staff before to allow GOVTECH to become more innovative (3).

4. References

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