CONSULTANT: HELP OR HINDERANCE?

Geraldine A. Kisiel, Ph.D.
Central Michigan University/AKRTI
and
Joseph L. Azarewicz, Ph.D.
AKRTI

ABSTRACT

This paper examines the relationship that exists between the consultant and his or her clients especially when the company is under stress. It is part of an ongoing study of small to mid-sized high technology companies. This particular aspect of the study is centered on companies which have been undergoing strain, and have sought out the assistance of consultants. The analysis is based on a study that uses Mixed Methods to determine what has and/or is occurring in the corporation under study. For each case examined, sensitizing concepts were used to further operationalize the three concepts of high-technology, government policy, and financial implications. Sensitizing concepts were also used to develop lists of informants for each company since the research was being done during and after the consultants had been contracted to assist with corporate issues. Specific techniques such as observation, questionnaires, in-depth interviewing, document analysis and financial analysis were also used. However, this paper focuses on an analysis of the results and does not discuss the specific techniques used or the specific data acquired. The techniques and data are being published elsewhere.

INTRODUCTION

The use of the sensitizing concept deserves comment. It is impossible to study organizations such as the ones designated here without some idea of what concepts ought to influence the research. These beginning, sensitizing concepts are what initializes the study. They do not restrain the research as so often happens with operational definitions. Defining a concept by stating how it will be observed may make the research easier but it can provide prescriptions of what to see, leaving out others which may in fact be very important. If a concept does not begin as a sensitizing concept on the way to becoming operationalized, it runs the risk of becoming irrelevant. The concept must be operationalized from within a relevant setting. The sensitizing definition or concept suggests directions along which to look, and rests on a general sense of what is relevant.

Table 1. CONCEPT OF SENSITIZING

SENSITIZING	Provides the researcher with a general sense of reference and guidance in approaching situations. The sensitizing concept suggests directions in which to look and rests on a general sense of what is relevant and may lead to operational definitions.
OPERATIONAL	Defines a concept by stating how it will be observed in the real world. Hopefully, the concept is operationalized from within the relevant setting. Otherwise, operational definitions provide descriptions of what to see.

The researcher expects that these initial concepts may be changed or even abandoned during the process of the study and other concepts may become more important. Hence, it is often necessary to refine and clarify concepts and examine empirical categories. After all concepts define categories, and the constituents of a category exemplify the concepts that unite them into that category.

The iterative approach of mixed methods also provide a greater level of reliability and validity concerning the source of the technological as well as managerial problems in the corporation. Unfortunately, this is the point at which the methodological illiteracy of many consultants becomes apparent. They are too often wedded to methodologies they have always used, whether action or evaluation research as practiced by Organizational Development consultants or surveys and questionnaires as used by more traditional ones. The information sought must include the most important questions that actually impact the conditions that exist in the company. Consultants should also be able to devise surveys that actually make it difficult for the respondents to give false information. They also should be able to conduct interviews and know when the information they are being given is false. When surveys or interviews are done, the information must be valid and it cannot be valid if this information does not encompass all the areas that affect the situation. It is not enough to ask questions concerning how departments are organized. Questions must also be asked regarding customers and government contracts as well as the effects of technology on the prospects of the corporation. Financial statements and strategies must be considered, as they often are. but so must the effects of technology strategy. In short, mixed methods should be used, as the cases in this study exemplify.

DELINEATION OF CONCEPTS

For the purposes of this paper we have chosen to define, describe, and operationalize the following concepts: high technology, government policy, and financial implications.

High-Technology

High Technology refers to the activities of corporations that are engaged in the design, development and introduction of new services, products and/or innovative manufacturing processes through the application of "state-of-the-art" scientific and technological knowledge. This includes biological, chemical and physical sciences with the accompanying technological basic research programs as opposed to developmental or applied research programs. High technology is generally centered around research and the people involved take great pride in pushing the state of the art as far as possible. High Technology corporations are generally accustomed to change since most their technology changes every two to three years (Moore's Law, 1965.) In some ways these corporations adjust to change rather than creating it. The criteria generally used to classify the high-tech corporation or to operationalize the concept are research expenditures, the use of scientific or technical personnel relative to total employees, the majority of employees holding advanced degrees (Ph.D. and M.S.), and service or product sophistication.

While it is difficult to measure the precise contribution of technological innovation and change to the growth of industries and even countries, there can be no doubt that it is essential to the process (Dodgson, 2000.) This technology has fundamentally altered what is produced and how it is produced, how information is processed, the amount of travel and by whom and what means, how children are educated, how the sick are cared for, how music is composed, how books are written, and on and on. There is virtually not a corporate management of any size, nor any place in the world that does not have to deal with some aspects of technology even if it is only in coping with their Information Technology (IT) department.

The technology strategy of a company should, first and foremost, be based on the core competencies of the company. These competencies should concentrate on what the company knows and what the company can do, not on the products which it produces and the markets in which it functions. Technology strategy comprises the definition, development, and use of those technological competencies that constitute their competitive advantage (Dodgson, 2000.) This strategy is concerned with three things: the policies, plans and procedures for acquiring knowledge and technology, managing that knowledge, and the ability to exploit them for profit. The specific issues to be managed are not only the research and development of new concepts and products, but operations and production, technological collaboration, and the commercialization process, all of which must be considered within an inherently complex and risky system.

With regard to the acquisition of technology, a company can acquire technology in many ways, either through its own research and development function, through purchase or licensing of patents from others, or by participating in the winning of SBIRs, Small Business Innovative Research sponsored by various government agencies. It can also use that technology in various ways. This is important because it puts emphasis on the overall use of a particular technology achieved both by sales of its own products and services using that technology and its direct sales of the technology to others (Ford, 1998.)

Strategy formulation is always a “tricky” issue especially when dealing with technology. An important initial problem is what has been described as “technological illiteracy” on the part of many top managements even at this relatively late date in the post-industrial cycle, at least in first world countries. There are still many chief executives and top managers who have an inability or unwillingness to think in terms of the strategic importance of the technology and even informational basis of their company. These executives almost appear to have surrendered control over this critical aspect of their business either to chance, or their IT departments. In other instances, managers tend to assume that all technology is high technology and so a coherent view of the actual technological base of a company is only necessary for high-technology companies. To quote an expert on the subject of technology strategy, “In fact it is in these apparently lower technology areas where complacency can lead to erosion of an unrecognized technology base and where sub-optimal technology exploitation may be tolerated (Ford, 1998:88.)”

Government Policy

Government policy literally sets the rules of commerce. The most important area of government influence is that of regulation. The instruments of regulation include devices such as taxes, tariffs, capital costs, exchange rates, prices, local ownership requirements, local value-added regulations, capital rationing, hiring quotas, export requirements, and import licensing. Governments can use any of these regulatory instruments to achieve their goals. In point of fact, the tightness of the regulatory environment, is an important factor in the application of government regulatory policy. There are often differences between government policy statements, the embodiment of these policies in laws and regulation, and their application. In addition, the government determines the structure of markets through barriers to entry. Changes in cost structures due to subsidies and taxation are also prevalent. The government literally regulates the offering of goods and services that are permissible and the sizes of markets based on government subsidies and purchases. (Schuler, Rehebein & Cramer, 2002.)

The central role of any government, whether North American or European, in shaping economic incentives is crucial. As a regulator, anti-trust enforcer, and sponsor of infrastructure development, the government critically influences the development of several key high technology markets (McGahan, 2002.) This occurs through laws that govern mergers and acquisitions, control exports, monitor access to information, and enforce tax collection (Sanchez, 2002.) One of the most fundamental areas is a system of patents, which preserves rights to an invention for a specified number of years. This is what makes new products expensive for consumers and the most profitable for their producers. The role of the government as a large-scale buyer of certain products who is willing to pay excessive prices is another area. Of course, state restrictions on imports and exports and state subsidies and tax benefits are also helpful (Wallerstein in Lechner& Boli, 2008.)

There are many nuances and considerations of governmental action with which many high-tech companies must cope (Kisiel & Trepo, 2003). For example, the various modalities by which governments interfere with the virtual marketplace are so extensive that they constitute a fundamental factor in determining prices and profits. Under these conditions there are times when a consultant may solve management problems but fail to adequately address the governmental issues. What is more unfortunate, and particularly concerns the authors, is that there are also times when consultants APPEAR to be giving good advice, but in actuality are failing because they have an inadequate perspective on governmental issues.

Financial Implications

The contracting issues that many corporations must deal with can be very daunting. In the United States, much basic research in the physical sciences is funded by government contracts. The Research and Development efforts (R&D) of corporations result in contracts and programs which may be funded by the Defense Advanced Research Projects Administration (DARPA), Small Business Innovative Research (SBIR) or other government research efforts. These contracts may be Cost Plus Fixed Fee (CPFF) or Fixed Price. Many of these contracts limit the amount of profit that may be charged, usually about 10%. Some of these contracts may include Government Furnished Equipment, (GFE), which includes the provision of access to government facilities and equipment without cost to the corporation. In addition, the R&D efforts can be coupled to product divisions to encourage commercialization. Commercialization can yield significant profits for a corporation, since they do not need to internally fund the initial R&D efforts, and may concentrate on product development. Also included are controls on technology, foreign exchange, restrictions on transfer pricing and the International Traffic and Arms Regulation (ITAR), which controls the movement of technology, equipment and innovative ideas from the U.S. to other countries of the world. In addition, there are contracts from various government agencies, research laboratories, military organizations, pharmaceutical houses and others.

The situation is fairly similar in the countries of the European Union. Although the United States has the highest per capita spending on military/government items, the countries of Europe, particularly Great Britain, also spend a great deal. They also contract with various companies and the contracts tend to be fairly similar to those in the United States. Even for very large corporations, the financial aspects that impinge on international companies are vast. In the case of electronics, there have been competing cross-border production networks set up by the

United States, Japanese and European firms, led by transnational companies that span the entire value chain. For high-tech industries such as electronics, these producer-driven chains must combine cost-competitiveness with product differentiation and speed to market. One of the most striking features of the electronics industry has been this rise of global contract manufacturers. A significant share of the world's electronics manufacturing capacity is now contained in just a few huge contractors such as Flextronics (which acquired Solectron in 2007,) Celestica and Foxconn. These firms are pure manufacturers. They sell no products under their own brand name. Instead, these companies focus on providing global manufacturing services to a very diverse set of firms such as Hewlett-Packard, Nortel, and Ericsson. They tend to drive innovation and create value for global customers. These major world-wide companies design, build and ship complete packaged products and provide field services to support customer end-to-end supply chain requirements. Such global contract manufacturers introduce a high degree of modularity into value chain governance because the large scale and scope of their operations create comprehensive bundles of standardized value chain activities that can be assessed by a variety of lead firms through modular networks, which then can be drawn down to smaller corporations (Gereffi in Smelser & Swedberg, 2005.) In short, the financial implications of contracting issues can lead to some very complicated consulting with these particular companies.

DISCUSSION OF CASES

The results of analyzing three cases will be discussed below.

Case 1

Case 1 involves a situation with Corporation A, a small research company which did approximately $100 million in business which merged with Corporation B, a smaller company which did approximately $25 million in business. This first example is a case where a consultant was brought in to deal with the resulting merged corporation as it began to negotiate its position in the marketplace.

The larger of the original two corporations (Corporation A) had absorbed the smaller and attempted to integrate the business of Corporation B into their own. This corporation (A) was a research organization, concentrating on government contracts and state of the art research programs. This, of course, meant a dictated profit margin of approximately 10%. The second organization (Corporation B) was a commercial operation concentrating on the production of consumer products with an expected profit margin of approximately 20%. However, Corporation B had a technology that the management of Corporation A thought would be an asset to them. This was the stated reason behind the merger. The risks and benefits of the merging parties were definitely unequal and were an important source of difficulty. (Buchel, 2003)

Corporation (A) had never dealt with products or commercial marketing. Top management were all technologists that had risen to their positions through the ranks and had little or no understanding of the cost structure of such a commercial enterprise. Since Corporation A was the larger of the two organizations, its management remained in place and the management of Corporation B was defined as a separate division. Unfortunately, shortly after the merger, Corporation B was discovered to be in financial difficulty and fast approaching bankruptcy. Rather obviously, due diligence had not been adequately performed.

Nonetheless, in an effort to maintain solvency, funds were diverted from the research profits of Corporation A to "shore up" the commercial activities. Company A, which was principally supported by government contracts with the government regulated profit margin, could simply not support the financing that was required to rejuvenate company B, and still maintain the internal research and development as well as proposal efforts required by the structure of government contracts. Management continued this way for about a year but the normal profit margin allowed by government contracts proved insufficient to support such a commercial enterprise.

In addition, difficulties had ensued from the attempt to meld such disparate corporate cultures. The culture of Company A was almost a typical entrepreneurial technological culture. The corporation's relationship with the government was quite good and government contracts were always available. The corporate culture of Company B was more varied, but more similar to that of a Hewlett-Packard. Unfortunately, the status of both the commercial and research operations in the marketplace was already on the decline.

It was at this point that top management called in the consultant to assist with the problems the company was experiencing. This consultant had no previous experience with mergers between hi-tech research organizations and commercial enterprises. To be honest, the authors know of no consultants that do. However the consultant who was hired came with recommendations from a member of the board of directors. Unfortunately, in this particular case, it resulted in a prescription for disaster.

The consultant's principal advice was to move the joint corporation in a new direction by changing the name and corporate identity, and attempting to modify the corporate culture. No consideration was given to the operational problems of the changing marketplace. The turbulent technological product environment was already undergoing change, forcing company B into the trailing edge of their product technology. No amount of management reorganization can compensate for the loss of competency in the required technical field. Nevertheless the management of the corporation took the consultant's advice and tried to integrate the corporation under a new name and even attempted to develop a new corporate culture. A significant amount of money was spent refurbishing the physical plant, designing a new company logo and revamping the corporation's public image. However, the cost of bringing new commercial products to the marketplace continued to exceed the profit margins of the government research part of the business as well as the reserve capital.

Eventually the corporation approached bankruptcy, the CEO was forced out and a third party purchased the corporation. Shortly after this purchase, the commercial part of the business was "spun-off," and an attempt was made to salvage part of the research operations. However, most of the management of the research segment of the company had begun to leave and the new management offered bonus contracts to some of the senior managers to remain with the company during the turbulent days of the takeover. In the interim between the initial actions suggested by the consultant to the original merged corporation and the purchase of the corporation by a new entity, as many as 25% of the employees had left the corporation with complaints of "lack of direction." Several of these employees ultimately were quite successful in the technology and have even founded their own companies within the discipline. The new corporation ultimately went out of business.

Obviously, despite their ability to handle high technology, neither the managers of Company A nor the managers of Company B were capable of making good business decisions. Company A in particular made two important errors: 1) they could have simply licenses the technology they wanted instead of buying the entire company, and 2) they knew nothing about commercial production and simply refused to admit the fact. Company B apparently thought their technology was worth more than it actually was. The consultant seemingly had a solution before he knew what the problem was. The incompetencies of everyone involved becomes apparent.

Case 2

Case 2 involved a mid sized company in the United States which did approximately $500 million in business. It also had a mix of product and government R&D efforts. This company had a history of commercialization of the results of the government R&D efforts. There was a good mix between the commercial products divisions and the R&D efforts that generated the prototype product. Many products that were generated under government R&D efforts were able to be transitioned to the product segments for successful commercialization.

The company was then acquired by a larger primarily commercial organization. This corporation, which was essentially a holding company, had decided to grow by the acquisition of several small high-tech companies. The organization had assessed its opportunities, determined the technological trends, looked at its own technological competencies and the threats to its position and decided to acquire current high technology by purchasing a high-tech company. One of the companies it chose was the mid-sized corporation mentioned above. The purchase of this particular high-tech company was acquired with the stated intension of improving the overall technology level of the corporation.

After the acquisition, the acquired company was left intact for approximately a year. Then the distribution of the segments of the high-tech company began. This process was done by top management with the help of consultants. During this time, none of the managers or the technologists of the acquired company were consulted. The technologists and the managers were simply incorporated into the various divisions of the larger corporation with no knowledge of how or why this was happening. The corporation apparently assumed that the technologists would find themselves in a new environment and simply begin work and "spread the high-tech like perfume." The management consultants, not being technologists, did not understand the nuances of high-technology efforts. They needed to acquire this knowledge from somewhere in order to advise their clients adequately in this area.

The product divisions of the acquired company had been the result of the commercialization of government sponsored R&D efforts. This government funded research division was left intact but had lost the synergism between their efforts and the product divisions. Although their business efforts were sizable, their profit margin was small, since it was limited to 7-12% by government R&D contract regulations. This did not compare favorably with the profit margins of larger than 20% as expected by the product divisions of the overall company. The future of this research division is now not only in question, but its days appear to be numbered.

In this case, top management was technologically illiterate. The consultant was managerially literate but technologically and methodologically illiterate. This case was an example of technologists who basically "outsmarted" the consultant by lying to him. The consultants had only one or two remedies in their "toolkit" and were apparently reluctant to seek data which would indicate that something else might be called for. They were more than willing to take the data from the interviews at face value, with no effort to cross check the results. Whether this was the result of the technological illiteracy of the consultants or their methodological illiteracy becomes moot.

Case 3

In this case, the consultant recognized the problem that the company was facing, and recommended appropriate actions. However the consultant could not break through the fact that the management of the company was too blinded by their own entrepreneurial enterprise that they neglected to make the necessary changes.

This case involves a small relatively low-tech company in Mexico that had a small engineering staff supported by technicians and a production staff. The company did business of approximately 10 million in U.S. dollars, producing commercial products using fiber-optic technology. Their customer base included several enterprises in the United States that produce consumer produces such as optic-optic lamps, toys and other commercial lighting products.

The entrepreneurs had founded the company by developing processes to make a particular grade of optic-optic material. They kept doing so even though the industry in general progressed to more complex materials, and was experiencing a gradual trend to glass fibers particularly for the enormously expanding communication industry.

The company began to lose their customers, but attributed this to their lack of marketing skills. As the company began to flounder, a management consultant was called in. This consultant did all the right things that management consultants do, including an analysis of the industry, the marketing program and the company's financial data. A new Director of Marketing was recommended and hired. This helped a little, but not enough. The consultant also suggested that they begin looking into the many new techniques being developed in the technology of fiber optics as a means of expanding their product line. Unfortunately, this advice was not heeded.

The entrepreneurial corporate structure was similar to that which often occurs in this type of start-up enterprises. Mexico has many competent engineers, technical and production staff, as well as finance staff. However, they suffer from some of the same problems that belabor scientific entrepreneurs anywhere in the world. Engineers and scientists are not necessarily good managers. Furthermore, the management was overlaid with family and friendship ties. This is not necessarily a bad thing, but it can cause problems. The president and vice-president were both engineers as well as brothers. They had started the company, worked very hard, and were competent engineers. But they were not competent managers. Like so many others entrepreneurs, they had the ideas and initiative to start the company, but were blinded by their own allegiance to the product that they had invented. They had the managerial ability to run the company once it began to grow, but not the foresight to change and modify their product as the technology changed. They had enough enterprise to hire a consultant and even to follow some of the consultant's suggestions. Unfortunately, it was not enough. They did not follow the suggestion that may have saved their company.

The consultant, although making the appropriate analyses, and recommendations, could not, or did not, break through the barrier that blinded the top management of the company. In the final analysis, the mangers can either take the advice of the consultant, or ignore it. In this case, the managers took some of the advice and ignored other parts of it, and did what they pleased. The company eventually dissolved and was absorbed by another enterprise.

In this case it was the management of the company that was technologically literate but obstinate and managerially illiterate to the point where they could not see that they were being left behind by the technology with which they were frankly enamored. The consultant was technologically, managerially and methodologically literate, but apparently, not forceful enough.

DISCUSSION

The purpose of this study was to examine cases of small to medium size high technology corporations that have faced management problems in the operation of their corporation, and have sought the assistance of consultants. This type of corporation often finds itself managed by the same entrepreneurial technologists that founded the organization and created the technology that the corporation was built upon. These founders may move into managing the growing corporation but may have little or no skills or training in management. These managers and their technical style may be sufficient in the initial growth stage of the company, but as the corporation develops and grows in size, the founding managers may be ill prepared to take the corporation into the kind of growth that requires hundreds of employees, and hundreds of millions of dollars in funding.

They may be blinded by their early success, and believe that they are equipped to take the organization further. The authors have encountered managers of this type and have heard statement such as: "All I have to do is read a couple of books on management" or, "just give me a few good ideas and I'll take it from there." There seems to be an inbred distrust and lack of regard for the management and social sciences among many of the technology driven engineers and scientists. This lack of understanding regarding management skills has another unfortunate aspect since it often translates into faulty communication with management consultants.

It is not only the technocrat manager that creates problems. Often the management consultants, even after doing interviewing in the company, frequently base decisions on unreliable sources of information and invalid data. One of the reasons for this inconsistency is that smaller growing technological corporations are often staffed by highly educated technocrats, who may be difficult to deal with and perhaps resent and distrust the imposition of a consultant. It has been said that managing and directing such people is like trying to manage a herd of cats (Bennis, 1999.) Cats, like technologists, have minds of their own, and would much rather do what they deem best rather than take direction from anyone. These technocrats, sometimes because of their distrust of the consultant, sometimes just because they feel like it, give spurious answers. Either they think the information they are providing is what the consultant wants to hear, or they wish to put roadblocks in the way of the consultant, or they simply do not care. In whatever case the information may not be what they actually believe. As a result, the consultant is provided with essentially invalid data. What may result is a well managed corporation which is about to declare bankruptcy.

Follow up interviews by the authors with the technologists that left the corporation during the change in Case 1 indicate a number of problems with the interviews. One concerned the information sought by the consultants. Much of the information had nothing to do with the technologies of either party to the merger, nor were there any questions regarding how projects were funded. It was these follow-up discussions concerning technology and finance that provided the authors with insight into this situation. It apparently was obvious to most of the technologists that the expected integration of the two companies was never possible. Corporation B had fallen behind the state of the art and had no contribution to offer to the high tech research programs of Company A. This was obviously a case of the management consultant being ill prepared for the task at hand. It is the belief of the authors that this constitutes a significant problem that needs to be faced by management consultants today, or at least those planning on consulting to high-tech corporations.

Modern technology experiences change so rapidly that even technologists working in the field may have difficulty keeping current. These technologists can be so immersed in their own segment of technology that they may be blinded to advances in other related areas. Some areas may undergo complete change in 2 to 3 years (Moore's Law, 1965.) A corporation that is technologically out of step with developments in their own technical field, as in Case 3, cannot succeed regardless of the efforts of the management consultant. The authors have consulted with organizations that have floundered because they continued their efforts with the existing technology, which the corporation had always successfully used, but without sufficient regard for the more sophisticated technological requirements which currently exists. As a result, the management consultant, when dealing with a high technology corporation, may need to find sources of information outside the corporation to form an unbiased assessment of the corporation's problems.

It is these issues that have been studied in this effort. The final issue deals with something that the authors find particularly troubling: the management consultant who fails to understand the technology and/or the specific governmental or financial exigencies of the corporation. A corporation that is technologically out of step with developments in their own technical field cannot succeed regardless of the efforts of the management consultant. The authors have consulted with organizations that were absolutely unable or unwilling to make the necessary technological changes in their product because the methods presently being used had always been successful in the past. The company was simply unable to see that the more sophisticated technological requirements which would sell the product were necessary.

A corporation that is held to a specific profit margin by government contract must be held to a different standard than for-profit corporations. Without this proviso, the company may very well flounder. It should be noted that these high-technology research organizations have a tendency to "look bad" to other management consultants that have not examined the nuances of government funding. The low profit margin of these corporations when compared to product organizations makes them look ineffective. What needs to be examined is their history and record of achievement. As a result, the occasional failure of the management consultant to recognize this idiosyncrasy of government funding, can severely impact the success or failure of these organizations.

CONCLUSION

This paper dealt with small to mid-sized hi-tech companies that seek the assistance of management consultants. Management consultants are paid to consult with these corporate managers on what is perceived to be management problems. Unfortunately, in many cases the management problem may be severely impacted by hi-tech issues within the corporation. Many consultants, who may be extremely competent in management issues, do not have much knowledge concerning the technology of the hi-tech corporation and the trends in that technology. What primarily concerned the authors is that most consultants have little idea where to obtain that knowledge. In this paper the authors have described three companies, which suffered from the lack of technical knowledge of the consultant who was supposed to guide the company through its problems. The discussion which followed laid out the reasoning behind the authors' contentions.

The cases of three different high technology corporations that were facing serious growth problems have been examined. In the first case, a merger between two corporations of similar technology was attempted. In the second case, a large corporation attempted to improve their technology and research capability by acquiring segments of a successful high technology corporation was examined. In the third case, a small corporation attempted to improve its position without regard for the changing technology. All three of these cases employed consultants to aid in these actions. This paper has argued that all three cases required the consultant to have knowledge regarding technology and government funding as well as management. It is unlikely that management consultants would have the technical expertise or depth that the technologists have. It is therefore imperative that the management consultant seek the advice of technical consultants who have experience across a broad range of the directions of technology. This paper has also argued that the consultant also needs a greater methodological literacy than many consultants apparently have and has suggested the use of Mixed Methods as a solution.

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