

Is the EPCM consultant still relevant?

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Background

In the spring of 1980, Dr Wim de Villiers, newly appointed managing director of Gencor, delivered his inaugural address to the senior managers of the new company. For some two hours he captivated us with his revolutionary corporate management theories based on the principle of decentralization. Gencor, the amalgamation of Union Corporation and General Mining, would in future embrace modern management principles and discard the arcane management art upon which the founding companies were built. We were to be taken out of the dark ages into the new world of enlightened business practices.

The strategic goal was a lean company that would narrowly define its core business so that it could become a world-class company, attract and create wealth for investors across the globe, and provide employment for the citizens of South Africa. To achieve these goals the company would have to manage its resources more productively, and that would mean unbundling and unburdening the company of all resources not directly involved in the production of its saleable products.

The concept of decentralized management flows naturally from an approach influenced by the thinking of Frederick W. Taylor, the father of scientific management. The Taylor system is characterized by a high degree of functionality and specialization and more importantly, the allocation of responsibility for the mechanics of management to functional specialists, and the dynamics of management to line management.

Decentralized management limits functionality and specialization and allocates as far as practical considerations allow, the responsibility for both the mechanics and dynamics of management applicable at a particular level of the scalar chain to the same person in the line organization.

This implies that detailed and highly complex functionality must then be sourced outside of the enterprise¹. However, the pattern of decentralization must also make provision for a degree of centralization. Responsibility, authority and accountability must be centralized at certain key positions from which overall leadership, direction and control emanates.

Dr de Villiers was indeed a visionary, as this is the strategy, to a lesser or greater degree, which all major mining houses adopted in the modern era.

First in line to go was the overstuffed and ineffective head office. The head office was the legacy of a drive towards more professionalism in engineering as the technical challenges faced by deep level mining became too much to handle for the 'practical' man of that day. The large demands for capital to develop the deep level mines was directly responsible for raising the required level of education of those who built and operated the mines. Financiers and bankers would not tolerate pouring large

sums of money into an industry that was so poorly managed as to be unable to muster its own professional association.

This need of the financiers for trustworthy and technically educated mining men drove the industry towards forging its own professional identity². Thus was born a management system, the core of which was the 'consulting engineer'. To this new generation fell the task of guiding the industry through the transition to 'managing mines as if they were factories'. During most of the twentieth century South African mines flourished under the capable leadership of the corps of consulting engineers employed by the large mining houses. It was the right management system for the prevailing environment of the twentieth century.

But times change and so do management systems. Towards the end of the last century other more attractive options presented themselves to mine owners. The in-house consulting system became an expensive monster that was not sustainable in the more competitive environment that became manifest in the last quarter of the twentieth century. The monolith created in the corporate mining houses had lost the professional excellence that created it in the first place. It became an autocratic centralized body that tried to make decisions often based on a dearth of solid reliable data and dispensed through a dilatory body of 'yes' men. This led to incredibly slow response times and diffused decision making. Therefore, as Dr de Villiers pointed out so eloquently, competition among the providers of functional services would provide mine owners with a better return on their money. Such competition could be achieved by outsourcing non-core services to specialist service providers outside the company, who would compete on a commercial and technical basis with each other. This became a global phenomenon, driven by the development and sophistication of collaborative technology solutions. Almost all of the major organizations in the world have comprehensive strategies to outsource non-core business across most of the traditional work disciplines, i.e. engineering, finance, business processes, management, training, etc.

I have stressed the vision of Dr de Villiers not only to identify him as a revolutionary and charismatic individual, but to demonstrate that changing circumstances compel leaders to analyse situations and use the best methods to ensure the long-term viability of their businesses. Strategy must be dynamic to keep pace with changing circumstances.

The environment has indeed changed. South Africa has become more industrialized and commercialized. As a result we are producing more highly educated mining practitioners who are continually challenging the status quo.

The premise of this paper is that the process and practice of creating and establishing new ventures for the mining industry has become a highly specialized profession which may, with advantage, be outsourced to specialist service

providers on a competitive basis.

This introduces concepts such as outsourcing, value to investors, and the EPCM model. The emphasis must always be to maximize the shareholders wealth in the long-term.

The outsourcing concept

Outsourcing is not a new concept³, it is simply another name for the longstanding practice of subcontracting.

The use of external lawyers, accountants, technology consultants and engineering contracting firms, for instance, can be viewed as outsourced services.

The reasons for outsourcing are manifold and it is a logical component of any organization's strategic planning efforts.

But first, let us look at the economic theory of outsourcing.

The economic theory of outsourcing

In 1973 Coase⁴ introduced the theory of transaction cost which readily became accepted into classic economic theory. The theory proposes that investments, including investments in outsourcing, help reduce transaction costs and in turn reduce the size of the firm, making it more productive.

Figure 1 shows that a shift in transaction cost from 'A' to 'B' measured by a reduction in transaction costs from 'a' to 'b', results in a reduction in the size of the firm (i.e., employees' physical facilities, etc.) from 'ac' to 'bc'.

Most of the literature uses this economic theory to justify outsourcing.

Another economic theory that applies to outsourcing is agency theory (Laudon and Laudon⁵, 2004, p. 83). Agency theory deals with the impact of outsourcing on employees, or 'agents', who work for owners of client businesses. According to this theory, as a firm grows in size and its supply chains and employee integrations increase, the owners need to increase the number of employees who work as agents to support the complexity of the organization. Thus, an investment in outsourcing saves the firm time, improves control over its business activities by moving non-core activities outside the firm, and requires fewer employees.

As Figure II shows, the agency cost reduction (from 'A' to 'B') moves the agency cost curve from 'a' to 'b', causing a reduction in the size of the firm from 'ac' to 'bc', principally a reduction in employees.

Besides these economic theories, it also helps to consider non-economic theories to gain a more complete understanding of the motivation to outsource.

An example is a social exchange theory proposed by

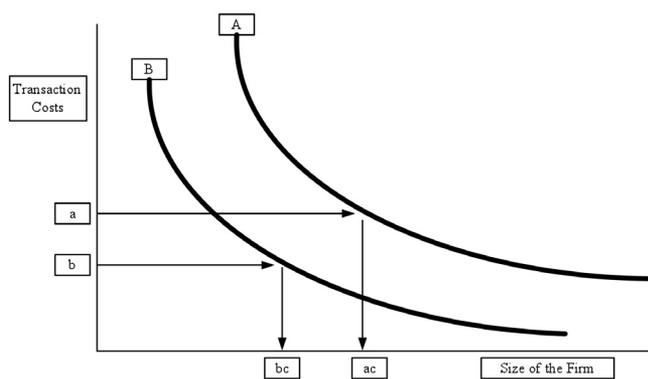


Figure 1. Transaction cost theory and outsourcing

Keven and Willcocks in 2001 (pp. 54–57), and called interorganizational relationship theory.

According to this theory, relationships arise for a number of reasons, each possessing a particular set of behavioural and structural elements. It helps to explain the outsourcing relationships that evolve and change over time, and it is best used to explain the reasons for interorganizational structures (i.e. between client and service provider) in terms of behavioural aspects. Understanding these non-economic relationships allows an economic theory to better explain the efficiencies observed in the outsourcing process.

These, and other management theories, have compelled corporate business to move up the value chain. This implies that either a company increases the overall amount of resources it manages—with the consequent effects on its balance sheet—or it withdraws resources from other parts of the company. Most companies have decided to withdraw resources and outsource some of the activities they were performing at the beginning of the value chain. Thus they are asking their suppliers to take over activities that they no longer want to do.

Nonetheless, in the hard practical arena of our mining businesses, the question always boils down to value, value in the hands of the investor.

Focusing resources to maximize shareholders value

Economic value added—a true measure of corporate

Services

Today, companies are evaluated by stock markets using tools such as economic value added (EVA)⁵. This has led companies to use similar measures internally to evaluate business and activities and to award bonuses to their executives. Consequently, executives constantly ask the question, 'Is this business or activity adding value for our shareholders?' This is a very different question from the traditional thinking of 'buy versus make' or 'Why should the company not keep margins in-house?'

The question now is, 'are we getting the value our shareholders demand from their investment in this business? If the answer is no, then the logic is that shareholders will exert pressure to move out of it. It is important to add that this logic is not generally well understood by corporate management, who tend to look more at the positive lessons coming from having the activity in house and the loss of control that appears to be associated with outsourcing.

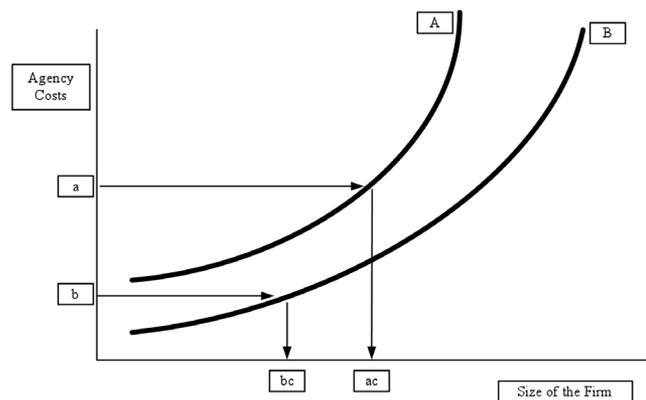


Figure 2. Agency theory and outsourcing

Further, quite often, at this level, the rationale used is to change ‘fixed’ costs into ‘variable’ costs or compare the in-house vs. outsource decision on a marginal cost basis.

The question of value, and more specifically EVA, is often not well understood by mining practitioners. What does an investor really want? As the competition for source capital grows ever fiercer, the cost of ignorance escalates. It is therefore vitally important for management to answer the question: what is the engine that drives share prices?

There are two competing models in general use: the accounting model and the economic model. The accounting model is simple but gives an illusion of precision. Its shortcoming is an utter lack of realism. The accounting model assumes, in effect, that price/earnings (P/E) multiples never change. But, P/E multiples change all the time—in the wake of acquisitions and divestitures, changes in financial structure, commodity prices, accounting policies. In short P/E multiples, adjust to changes in the quality of a company’s earnings and that makes EPS a very unreliable measure of value⁶.

The competing model—the economic model of value—holds that share prices are determined by smart investors who care about just two things: the cash to be generated over the life of the business and the risks of the cash receipt. What truly determines share prices, the evidence proves, is the cash, adjusted for time and risk, that investors can expect to get back over the life of the business. What the market wants is not earnings now, but value now. The question is how can discounted cash flow, which truly is at the heart of market valuation, become the integrating force behind the decision making process.

The answer is actually quite straightforward. Management should focus on maximizing EVA, i.e. net operating profits after tax less the cost of all the capital employed to produce these profits. EVA is the only performance measure that is entirely consistent with the standard capital budgeting rule: accept all positive and reject all negative present value investments. Earnings per share, on the other hand, will increase as long as new capital invested earns anything more than the after-tax cost of borrowing, which is hardly an acceptable return.

The fact is, if the discounted EVA is positive, the company has added value to the out of pocket resources drawn into the firm; if EVA is projected to be negative, value has been destroyed. EVA, in short, it is the fuel that fires up a premium in the stock market value of any company or accounts for its discounts. That is EVA’s greatest significance and it is the property that sets EVA above every other financial performance measure, including cash flow.

The cash flow myth

However important cash flow may be as a measure of value, it is virtually useless as a measure of performance. So long as management invests in rewarding projects—those with returns above the cost of capital—the more investment that is made and the more negative the immediate net cash flow from operations, the more valuable the company will be. It is only when it is considered over the life of the business and not in any given year, that cash flow becomes significant.

EVA, on the other hand, is both a measure of value and a measure of performance. As a matter of fact it is the only measure that can link forward – looking valuation and capital budgeting procedures with the manner in which performance subsequently can be evaluated. The conclusion is inescapable but perhaps shocking: Abandon the practice

of discounting cash flow and discount EVA instead. The valuations will be the same, that’s true, but comprehension and communications will be dramatically strengthened.

For these reasons and more, EVA is the right measure to use for setting goals, evaluating performance, determining bonuses, communicating with investors and yes, on which the outsourcing decision should be based.

EVA is the only reliable measure on which to base the insource/outsource decision because among other factors it discounts long-term risk. EVA requires that the basics of economic risk analysis involving trade-offs and opportunity cost be fully understood before a meaningful result can be produced.

Opportunity cost is the value of the next-best use of a resource, where value is measured as foregone alternative benefits. Risk-reduction resources are being used wisely if it is impossible to reallocate those resources to produce more risk-reduction benefits.

In the world of projects research has shown that the most important risk-mitigating factor is project management maturity⁷.

This concept will be more comprehensively developed in the next section when the EPCM model of contracting is discussed.

The engineering, procurement construction and management (EPCM) model of contracting

‘Before crossing the river don’t insult the alligator’s mother’—West Indian Wisdom

The South African Mining Industry, has over the last two decades, preferred to outsource their projects to service providers based on some form of the EPCM model. This model embraces elements of project management and design (PM&D) but lacks the comprehensive and integrating framework of PM&D. Whereas PM&D has a formalized body of knowledge and a recognized professional institution, EPCM has no such professional underpinning. EPCM is totally dependent for its definition and legal interpretation on the specific contract agreed between the client and service provider. The elements of EPCM could therefore be subdivided and fragmented, which will inevitably lead to increased risk to the client.

Furthermore, in the EPCM model, service delivery to the client is input based on time elements at specific unit rates for each discipline that the client thinks should be allocated to an activity. Once again the risk moves subtly to the client in that a particular output remains undefined and therefore unaccountable by the service provider. The service provider’s risk is confined to acting with diligence and a duty of care, a risk that the service provider can mitigate by some form of professional indemnity insurance.

On the other hand, the client has greater flexibility and more control under the EPCM contract in that only detailed activities that the client identifies and defines may be let to the EPCM. Obviously under these circumstances, the client will require a stronger owner’s team that will become involved in the day-to-day operational issues and therefore in the long-term, higher overheads. Very often this situation leads to duplication, if not wasted effort, as the cost of control tends to exceed the control of cost. The result is a significant reduction in EVA. This poses a compelling philosophical question—does the EPCM model lend itself to the ideals of outsourced project management or is it just another way of outsourcing skills to a consultant or worse

still, is it not just an employment agency dressed up in professional clothes? It remains debatable how far mining houses can or are prepared to go along the outsourcing route. Can we fully embrace the holistic approach of Dr De Villiers's vision of a narrow focus on core functions or does the syndrome of layered and diffused management still predominate top management thinking?

The main driver of these and other aberrations of the project model is the current credit collapse of the world economy. The view of modern economic researchers is that our interpretation of the free-market system has an inherent propensity for cycles of boom-and-bust. The biggest boom in seventy years turned straight into the biggest bust—the very theme of this conference.

Leaders are constantly trying to buy time as they wait for the cycle to turn. Short-term quick-fix models, some with merit, others that are quite frankly absurd are being implemented with a sense that any change is better than holding the status quo.

Now, more than ever, only a soundly reasoned approach will deliver a sustainable answer. The over used, 'back to basics' approach is advocated by the author. At a fundamental level two questions need to be asked:

- What do clients want from their EPCM consultants?
- What do EPCM consultants want from their clients?

The answers to these questions will form the basis of a more successful project model.

What do clients want from their EPCM consultants?

The simple truth is that in many cases clients have become frustrated if not disenchanted with EPCM consultants who do not live up to their own extravagant self-promotion. This is not to deny that there are many reputable and solid EPCM consultants who constantly deliver on their commitments, there are also many who know that they should do better to justify their fees. Worse, there are some very mediocre EPCM consultants who believe high fees can hide poor quality. As supposed expert specialists, it is amazing how often EPCMs provide inadequate value to their clients.

Typically, to meet a client's cashflow constraints, the EPCM consultant will reduce the underlying support resources to produce a deliverable that has a very low probability of meeting the required result. Most EPCM contracts are based on an input model of charge-out rate times aggregate personnel hours plus a fee. Therefore, the most obvious variable to reduce the overall cost to the client is to reduce personnel hours (the other variables are more market related). It should also be obvious that this practice will dramatically increase the risk of not achieving a successful outcome of the project. Furthermore, as said before, cost should not be confused with value or more appropriately EVA, a point that is frequently missed by the role players, to the detriment of investors.

The boom conditions of the previous cycle resulted in a huge strain on the available supply of skills to the project industry. In many instances EPCM consultants resorted to recruiting from the pool of operations personnel on the mines. To convert these skills from an operational background into a project orientated resource requires much training and mentoring. This fact is not often appreciated by both the EPCM consultant and the client.

Mine management is based on a command and control structure with well-defined levels of authority. The hierarchical principle is embedded in a sharp division of labour, driven by a top-down approach.

Project management, on the other hand, is a matrix orientated concept which, if applied incorrectly, leads to systematic contradictions, role confusions, resistance to instructions, a lessened sense of ownership, and to accountability without authority⁸. The matrix organization demands unprecedented cooperation within today's industries and organizations. If project management (which requires the coupling of collaboration with imagination) is to succeed, the answer lies with the radically alert mind with a highly developed leadership intelligence.

There are also paradoxical demands on the qualities of a project manager. Officially, the project management system endorses generalists—people who can take advantage of their broad experience. The truth is, however, that it rewards specialists, people who put their lifelong focus on only one type of organization. For the non-leader the paradox is difficult to manage. For the leader whose mind is spacious, there is ample room, as the leader's mind thrives on paradox.

In our company (RSV) we have found that it takes between five and eight years to transform an operational manager into a project manager. It is therefore axiomatic that in today's highly competitive market the project management organization must be specialist and mature to succeed.

The concept of project management maturity assesses an organization's probability of successfully executing a project⁹. This model provides best practices to ensure management organizations' effectiveness at performing project management tasks. Therefore, it gives investors and their agents the assurance that their projects will realize the benefits that were the basis for undertaking the project in the first place.

Implementing the nine PMBOK[®] knowledge areas allows a project management organization to measure its maturity at five distinct levels. The higher the level of maturity the higher the probability of achieving the client's project goals. The client may therefore specify the minimum level of maturity required from the service provider, thereby lowering the risk of project malfunction and it also makes for more equitable selection in the tendering organizations.

A key reason for the negative perception of EPCM consultants is the fact that too many are focused on what they have to offer and how they make money, rather on what their clients need. Too many consultants provide context-free and generic service, whereas what clients need is service, tailored to their specific culture and context. Overall, too many EPCM consultants waste time trying to be clever, rather than asking themselves what actually makes a good consultant.

This means EPCM consultants must provide a more client-centric service¹⁰ and strive continuously to put this in the context of the client's organization. The consultant must have an intimate knowledge of the client's operations so that ideas and concepts are relevant to the success of the client. Advice and implementation of concepts must have a higher probability of success otherwise the client/EPCM consultant relationship will not be sustainable. However, to be successful the EPCM consultant must serve without being servile.

What does the EPCM consultant want from the client?

Project definition

At the essence of project failure is inadequate problem definition. As J.M. Juaran, doyen of quality management

says, 'a project is a problem scheduled for solution'. If the problem is not well understood, then we make the classic error of developing the right solution to the wrong problem. This can be overridden by attempting to understand the real reason for doing the job, then writing a problem statement to reflect that objective. The more time spent at the beginning of the project defining exactly the project to be solved, the higher the probability of creating a successful solution. The client and project teams must continue the process of redefining the problem as new information becomes available. They must be ever mindful that project variables can only be predicted at an error level associated with a probability of realization. The four project variables are interdependent and forms the basis of the project equation, namely

$$C = f(P, T, S)$$

where C = cost or budget constraints
 P = desired performance or quality level
 T = time or schedule allocation
 S = magnitude or Scope of work

The exact numerical solution of this equation is difficult but both client and EPCM teams must, at all times, be aware of the interdependence of these variables. Values for any three of the variables can be dictated, but the value of the fourth one will be determined by the relationship among them. The project equation will be the basis of all trade-offs among the variables. It is of the utmost importance that the client establishes the trade-off constraints at the outset of the project.

Trust

The concepts of decentralization, outsourcing and more specifically the matrix structure of project management is critically dependent on the level of trust that exists among the role players. Trust facilitates decentralization, it facilitates increased truthful communication and leads to collaboration over the allocation of scarce resources. Consequently, organizations with high levels of trust are more likely to successfully deliver projects and negotiate crises as they arise¹¹.

Supply chain managers are acutely aware of the benefits of developing close relationships with service providers. This way they collaborate to create superior value for the extended stakeholder value chain. The rationale behind these practices is that service providers, being specialists, have competencies that develop superior projects. Developing close relationships with service providers will result in mutual benefits and reduce the cost of transactions. This will allow project managers and others to concentrate on creating a more efficient supply chain.

For Bobby Godsell (address to graduates of St Augustine's College of South Africa—2008/2009)¹², the rebuilding of trust goes further than training methods, programmes and knowledge. It goes to the root of the value system that determines our interpersonal relationships. He rightly points out that true knowledge lies not in a pit of detailed information, nor in the mastery of laws and formulas, but in identifying those sheer anchor values that govern behaviour. He asks some pertinent questions: How do we find the way back to honest money? How do we make markets work for society? How do we replace executive greed and unaccountability with service, duty and real wealth among business relationships?

Ethics is the way human beings choose between alternative morally significant courses of action. Here we

come to the essence of rebuilding trust between service provider and client, and the client being the dominant party in this relationship must lead the way.

The partnering model currently proposed by the supply chain divisions of the major mining houses is the first step to return to good business ethics.

Owners team

The concept of an outsourced service provider—the EPCM model—is driven by an increasing trend towards specialization and a need to draw specialists from outside the client's organization. Like any other function in the organization, the service provider must be managed and to do this effectively requires a dedicated owner's team¹³.

In the first place the owners' team must ensure that the client's corporate strategies, initiatives and goals are thoroughly embedded into the EPCM consultant.

This will be achieved by proactive definition of deliverables, methodologies, specifications, standards and corporate culture. It is therefore critical that the owner's team comprises experienced individuals who understand not only the culture and ethos of their organization but also the processes, procedures and protocols of project management. But, more importantly, it is the executive assigned to the role of project sponsor who plays a key role. According to research and also the author's personal experience, 'the number one contributor to project management success is visible and effective sponsorship' (Englund and Bucero, 2006)¹⁴.

Complex projects need sponsors who are leaders rather than managers. This means people who are able to establish directions for the future, communicate through vision, and create aligned high-performance teams, people who are highly focused on planning and shortening horizons.

Complex projects need leaders who inspire people and fuse them into a motivating performing team driven by a common vision.

One of the first roles the project sponsor must play is to form a buffer between his organizational politics and the project team. Politics are present in any organization and particularly when an attempt is made to turn a vision for change into reality. It is a fact of life, not dirty word that should be stamped out. Negative politics creates a win—lose environment in an underhanded or covert manner.

Manipulation of people has undesirable results. Secret discussions become more prevalent than public ones. Reciprocal agreements are made to benefit individuals rather than organizations.

The client must appoint a sponsor who can create an environment of positive politics. In a positive political environment people operate with a win-win attitude. All actions are out in the open. People openly work hard toward the common goal. Outcomes are desirable or at least acceptable to all parties concerned. Good, smart people trust each other, even if they do not always agree. When people get together to solve clearly defined and important issues, guided by effective, facilitated processes, with full disclosure and all information out in the open, they can accomplish almost anything.

The good project sponsor has a broad world view that embraces the objectives and needs of all the parties throughout the project life cycle and even beyond to the product life cycle.

The demands and requirements are extremely demanding from the project sponsor and require that the utmost

discretion be applied on selecting the right person. On this individual, more than any other, depends the outcome of a project.

Conclusion

In our desperate search for more frugal methods of project implementation we must be careful not to reintroduce methods and philosophies that have failed in the past. By promoting sub-core functions to core functions, focus and effort is diluted thus reducing opportunities and fostering mediocrity which will eventually lead to a dramatic collapse of all the good intentions. This obsession with a short-term solution alternative, as it might seem from the immediate cost-reduction imperative, will have a dramatic long-term eroding effect on the yield of investment. History is rich with such examples, both local and global.

We need to find ways of greater cooperation between client and service provider, if necessary, by trial and error and by risk taking.

New institutions of cooperation must be established to meet the ever changing domestic and global business environment.

No solution that involves fragmentation of the effort or project can be sustainable. Only total integration of the efforts of all parties will lead to a sustainable solution. To this end we must develop an enabling environment of meritocracy, trust and leadership across all aspects of Client/EPCM consultant/client engagement.

The essential theme of this paper is to develop an understanding of the value that is created for stakeholders, across the board, when a rational approach is adopted to creating new mining ventures. The fundamental theory of the paper is that the value an organization realizes is a function of the contexts it operates in and the project management implementation that is undertaken. Neither dimension alone, therefore, would be sufficient to adjudge an optimum framework for the measurement of value creation.

While tangible measures such as cost, performance, EVA, and ROI can be reduced to metrics; the intangibles such as satisfaction, alignment, process and business outcome have significant influence in which model to choose and how it must be implemented.

Nonetheless, one is extremely comfortable to conclude, that in the realm of tangible measures of value, the economic value added (EVA), is worth considering. Intangible value is manifested by, improvement in decision making; enhanced collaboration and communications; alignment of approaches and values in organizations;

overall effectiveness of the organization and its management approach; improved transparency; clarity of structures; and accountability. The best assurance of achieving these intangible values lies in the maturity of project implementation.

There are many areas of further research to fully develop a project implementation that would meet the demands of an ever changing business cycle. This would suggest that the process is continuing.

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