

Chapter 3

Financial Management

Abstract In spite of the economic claims made for Agile (e.g., enhanced return on investment, cost risk management), financial and accounting aspects of Agile are a relatively neglected topic (e.g., advice on accounting for capital and operational expenditure, pricing models). Yet value delivery and economic risk mitigation lie at the heart of Agile one of whose central tenet is the use of feedback loops to validate and refine solutions. Moreover, the iterative and incremental structure of agile projects directly contributes to improved rates of return owing to the frequency of benefits enablement which improves the net present value of expected future cash flows. It is therefore prudent to embed classical appraisal thinking into agile projects (e.g., increment level assessment of return on investment) in order to demonstrate value to the customer and to ensure that an appropriately agile contracting framework and pricing model are in place that recognise the unique features of Agile whilst permitting the learning that takes place within such environments to enhance value.

3.1 Introduction

Projects deliver value within an organisation [15] and for projects whose value is defined in terms of revenue generation, project appraisal techniques play an important role. Not all projects, however, are intended to be revenue generation vehicles. For example, in the public sector projects may aim to deliver social benefits and in this context cost, rather than revenue, may be the primary driver. Such assessments usually take place early on in the project (e.g., DSDM suggests that cost-benefit analysis be done in the Foundations phase as described in Chap. 4) and constitute part of project selection at the portfolio and programme levels. There is, however, an inherent uncertainty in such practices since they are based on forecasting future cash flows the purpose of which is to compare the impact of expected future revenues against known costs. To an extent Agile alleviates some of this risk through incremental delivery which permits focus on shorter term certainties (i.e., where sufficient information is

already available on which to base decisions) but otherwise appraisal techniques are the same as for traditional projects, the most common of which include:

- *Payback Period*. This is defined as the period of time a project will take to return funds invested in it. This measure is limited since it takes no account of future profitability of the project beyond the payback period.
- *Net Present Value*. These factor in time value of money to reduce all future expected cash flows to a single point and use this calculation to determine if the project is viable (i.e., if the net present value is greater than zero). This is considered one of the most robust approaches to investment analysis but is subject to the uncertainty of forecasting future cash flows.
- *Internal Rate of Return*. The Internal Rate of Return (IRR) is that effective compounded rate of return which makes zero the sum of all future expected cash flows, discounted to present day. The computation of the IRR can involve some complicated algebra that yields a unique solution only in certain circumstances in order for it to make sense (e.g., a project with an initial capital investment followed by subsequent cash flows relating to costs and revenues but no sizeable decommissioning costs). Projects are deemed acceptable if the IRR is unique and is higher than the required rate of return reflecting the opportunity cost¹ of the funds.
- *Profitability Index*. This accounting based index is defined as the net present value of cash flows following the initial investment divided by the initial investment. Projects are deemed acceptable if this figure exceeds one.

Considered in terms of investments, the return on investment metric ought also to be used to assess emergent returns at regular intervals throughout the project (e.g., on delivery of an increment). Formally, return on investment is defined as the difference between the gains and costs of an investment divided by the investment amount (though there are some minor variations on this formula). The challenge with investments (especially in the IT sector [214]) is the determination of derived benefit since often projects result in evolutionary change that translates into moving targets from an appraisal point of view. Moreover sometimes the purpose of an IT investment is either to reduce costs (referred to as cost displacement or avoidance) or to improve the competitive advantage of business (e.g., creating a decision-making capability based on data analytics) affecting the manner in which value is assessed and evaluated. In general, however, in the commercial sector there is little point in IT investment unless this results in improvements in how business is conducted that lead to improved profits or returns on investment. Thus IT investment must be understood in terms of the business processes and practices they support and this necessitates a partnership of IT and business that is capable of agreeing what the final outcome of a project should be and how benefits are to be measured (e.g., formulation of a Business Case linked to Benefits Assessment as described in Chap. 4). Such benefits may be related to the efficiency of a business process expressed in cost or pricing terms (e.g., more output for the same level of input), improved solution quality or

¹ The opportunity cost is that amount which could reasonably have been expected to be made had the funds not been used for the project.

simply higher morale amongst the workforce. Therefore, whilst an economic focus prevails in this chapter, in practice any number of different metrics may be used to assess benefits and value generation.

3.2 Beyond Budgeting

Parallel to developments in the agile community, there arose during the 1990s a set of accounting based principles and practices collectively referred to as Beyond Budgeting [121] that challenged traditional performance management based on budgetary controls (e.g., formulation of mission statements, strategic plans and programmes and variance analysis). Central to this criticism of the budget process is that it is too expensive and cumbersome and is not appropriate for dynamic and competitive environments. Instead, Beyond Budgeting promotes techniques based on integrated shared goals and values (e.g., Balanced Scorecard) and activity based accounting. Intended to cope with fast changing environments this approach shares much in common with Agile and its own set of principles can be classified as follows in leadership and process terms:

- *Leadership Principles*

- *Customers.* Focus everyone on improving customer outcomes, not on hierarchical relationships.
- *Organisation.* Organise as a network of lean accountable teams, not around centralised functions.
- *Responsibility.* Enable everyone to act and think like a leader, not merely following the plan.
- *Autonomy.* Give teams the freedom and capacity to act, do no micro-manage them.
- *Values.* Govern through a few clear values, goals and boundaries, not detailed rules and budgets.
- *Transparency.* Promote open information for self-management, do not restrict it hierarchically

- *Process Principles*

- *Goals.* Set relative goals for continuous improvement, do not negotiate fixed performance contracts.
- *Rewards.* Reward shared success based on relative performance, not on meeting fixed targets.
- *Planning.* Make planning a continuous and inclusive process, not a top down annual event.
- *Controls.* Base controls on relative indicators and trends, not variances against a plan.
- *Resources.* Make resources available as needed, not through annual budget allocations.

- *Coordination.* Coordinate interactions dynamically not through annual planning cycles.

The connection with Agile becomes clear when one considers organisational paradigm of self-organisation built around, entrepreneurial and empowered teams, customer involvement, autonomy and delegated decision-making including the freedom of the team to select its own quality and performance metrics, solution development methodology and control of funding (e.g., training, equipment). Moreover there is a clear rejection in the Beyond Budgeting movement of planning over long timeframes where insufficient information exists with which to make key decisions (e.g., setting of annual budgets) in favour of more short-term adaptive controls. For example, the annual budget cycle can have a debilitating effect on adaptive planning as the focus shifts towards the tracking of deviations from a plan and away from responsiveness towards customers needs. Crude measures such as the inclusion of a budget buffer to accommodate unanticipated events do little to resolve this issue owing to their fundamental misunderstanding of the underlying dynamics of change.

Performance management, considered here as a subdiscipline of management accountancy, is concerned with the structure of incentive schemes and the evaluation of performance. From an agile perspective, group rather than individual rewards are preferred since the latter tends to distort behaviours within the group that act against the interests of the organisation (e.g., non-sharing of information). Instead schemes based on profit sharing or relative performance evaluation tend to find more favour though their effectiveness does in part rely on positive group dynamics and conflict resolution (e.g., tackling of social loafing). Use of benchmarks, key performance indicators or subjective peer reviews are common in this context. In situations where teams are not competing for the same internal resources there can also arise positive interactions and knowledge sharing at the intra-team level that help improve coordination across the enterprise thereby enabling integrated performance management at higher levels.

3.3 Expenditure and Profit

Since profitability is a central concern of organisations it is necessary to understand what profit actually is. At its simplest level profit refers to revenues less the operating costs (e.g., salaries, facilities, expenses) incurred in acquiring them. However, the accounting of costs within an organisation also makes accommodation for long term liabilities that impact how profit is reported. For example, using well defined financial accounting rules the acquisition or upgrade of a major infrastructural component may be charged over its nominal lifetime. The distribution of charges over longer periods in this manner represents a consistent and fair assessment of situation since otherwise a large charge would appear to wipe out the profits of period in which it was incurred and thereafter seemingly play no further part in the economic fortunes

of the organisation. Thus to determine profit the structure of costs (i.e., capitalisation charges versus operational expenses) needs to be clarified.

Outgoings in projects (in particular those in the IT sector) can broadly be classified as capital or operational expenditures.² Although organisations have some freedom concerning how to classify costs there are rules [126] to which they must abide. Generally speaking, operational expenditure covers non-asset generating activity such as the assessment of whether or not a project should be initiated or costs incurred deploying and operating increments. Operational expenses are incurred within the current accounting period and are recorded on the income statement.³ Capital expenditure, on the other hand, covers work that results in an asset (e.g., software package) or entities that must be acquired in order to support it (e.g., infrastructure), i.e., capitalised costs are incurred on assets that are not expensed in the period in which they were created but rather are depreciated or amortised over time. These are recorded in the balance sheet⁴ and the depreciation costs are recorded over future income statements. Thus the central issue to determining which form of expenditure applies is to consider what the outcome of an activity is and what implications this has for ownership of the underlying asset. This helps resolve seemingly difficult issues that arise in practice. For example, acquisition of software or upgrades to existing infrastructure are capital charges whereas product support and maintenance (incl. bug fixing) are operational expenses. Equally consumption models may impact on this classification (e.g., SaaS is considered an operational expense since the asset is not on the balance sheet of the organisation using the service).

Most agile methodologies have difficulty in determining the point of capitalisation in their projects owing to the lack of clear boundaries that delimit capital and operational activities. In some respects DSDM provides a potential means of addressing this issue since it employs a phased model that enables such a separation of capital and operational expenses. This model, described in Chap. 4, segments the solution development process into Feasibility, Foundations, Evolutionary Development and Deployment phases sandwiched between Pre- and Post-Project phases. Most activities in the Evolutionary Development phase could in theory be considered capital charges whereas all other phases are mostly concerned with operational expenses as indicated by Fig. 3.1. Difficulty arises though in the explorative nature of Agile (e.g., prototyping) whose activities are generally expensed (e.g., prototyping and modelling that occurs during Evolutionary Development) suggesting perhaps that a percentage-based allocation should be used such as capitalising the Consolidation and Refinement subphases of a structured Timebox (see Chap. 4) as illustrated in Fig. 3.1.

² Capital and operational expenditures are often abbreviated to CAPEX and OPEX respectively.

³ The income statement is an account of all revenues and expenses during a specific period of time (e.g., over the course of a year).

⁴ The balance sheet lists all of the assets and liabilities of an organisation at a specific point of time. Assets are resources of net positive economic value that are owned or controlled by the organisation and liabilities are outstanding obligations that imply the transfer of funds or a commitment to provide goods or services.

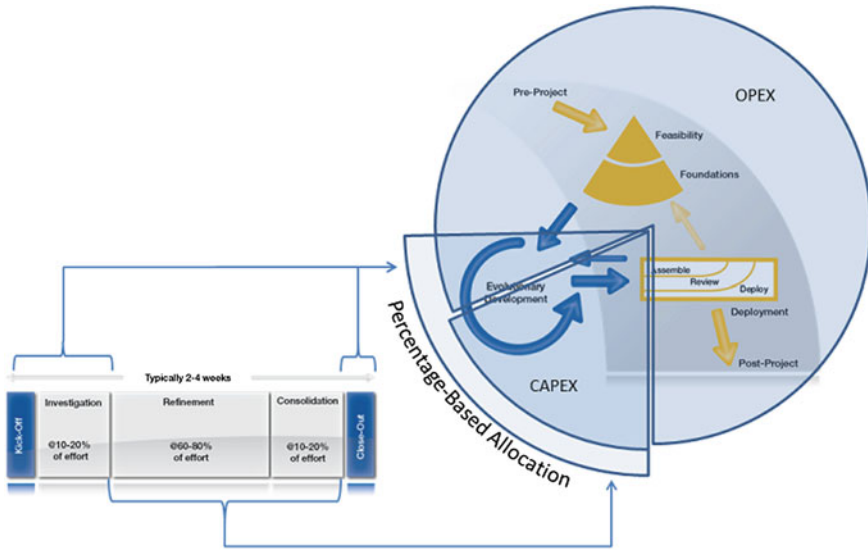


Fig. 3.1 Possible Partition of Capital (CAPEX) and Operational (OPEX) Expenditure for DSDM Projects. Adapted from [73]. Reprinted and modified with permission

The Scaled Agile Framework® argues that most asset evolving activity occurs on the Agile Release Train, a long lived group of agile teams working together to deliver programme level value, to which a number of dedicated support roles (and their related costs) are assigned [225]. Accordingly capitalisation at the Agile Release Train level may be expressed as a crude percentage of overall activity or be broken down to the epic and user story level once initial spiking has concluded that the work should be undertaken. Either story points or time may be used as the basis of allocation. This ensures separation of feasibility from implementation though other activities still remain that require specific treatment depending on the circumstances of the project (e.g., architectural epics and spikes). Applying similar principles to other methodologies (e.g., Scrum, XP) it is conceivable that a means can be found to account for costs though not without some burden on the team in terms of reporting.

In practice most product development organisation simply expense their costs (e.g., software development) whereas internal IT departments may use either form of classification as appropriate provided that this is done consistently. In the final analysis, taxation is often a consideration since expensing costs means that they are accounted for earlier and can be included in the profit calculation on which tax is based leaving some to suggest that capitalisation may appear to give an inflated impression of profits. It is therefore fair to say that profit is a matter of (accounting) opinion and thus care should be taken when using accounting based metrics to assess (agile) projects since these are strongly influenced by changes in the application of accounting principles (e.g., nature of amortisation or use of depreciation model).

3.4 Project Appraisal

Capital budgeting is concerning with the assessment of project viability against predefined criteria (with particular emphasis on the future value generation potential of a project) in order to determine where best to deploy a firm's limited resources and capital [63]. Since investment funds are capable of attracting interest over time, the timing of cash flows becomes relevant for investment decisions. Time value of money refers to the notion that present day funds are more valuable unit-for-unit than the same amount at a future point in time owing to their ability to accrue interest. Thus if an amount is capable of earning ten percent per annum then ninety cents today is equivalent to € 1 one year from now⁵ since ninety cents today invested at ten percent per year amounts to approximately € 1. The premise of time value for money is that there exists an expected rate of return that remains constant for the period in question. In the corporate context this rate is usually linked to the weighted average cost of capital which broadly refers to the average of costs of financing an organisation (or departmental unit therein) based on its capital structure (i.e., the extent to which it is funded through a combination of equity and bonds). It follows that an organisation will therefore want to invest in projects that deliver a higher rate of return than that which represents its own financing or opportunity costs. Accordingly, the timing of cash flows of projects must be assessed in terms of a discount factor based on the weighted average cost of capital though in practice this rate is often adjusted as appropriate (e.g., to account for real rates of interest, inflation or to include a risk premium).

Capital budgeting involves the computation of future net cash flows based on expected revenues less costs (incl. working capital) all of which is discounted back to present day values. Thus projects will be approved if they are deemed to be capable of contributing a net positive value to the bottom line. When considering what constitutes a cash flow from a capital budgeting perspective there are a number of subtle details that must be taken into account (e.g., exclusion of sunk costs,⁶ handling of marginal costs and the treatment of tax). Though important in practice these will not be considered in detail here owing to their technical and operational character and the fact that they are treated in entirely the same manner in agile projects as in traditional ones. The basis of net present value calculations is to divide the future into equal time periods (e.g., iterations) and to discount back net cash flows to the present day. Thus if a net amount of CF_i is realised in period i and the expected period rate of return is r then its contribution to the net present value is

$$NPV_i = \frac{CF_i}{(1 + r)^i}$$

⁵ This calculation is derived by $0.9 \approx \frac{1}{1.1}$.

⁶ Sunk costs are those incurred before the decision-making process and which are not materially affected by the outcome of the decision.

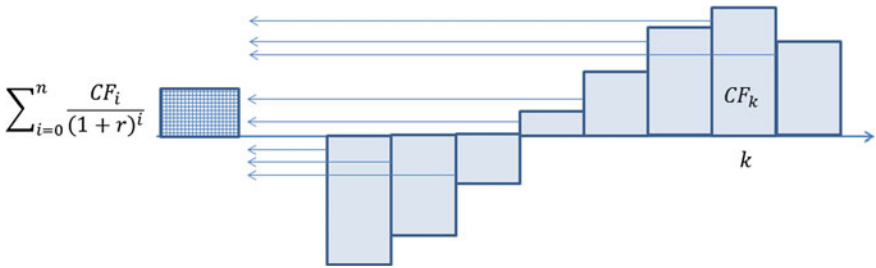


Fig. 3.2 Net Present Value of Project Cash Flows. Published with kind permission of © Alan Moran 2015

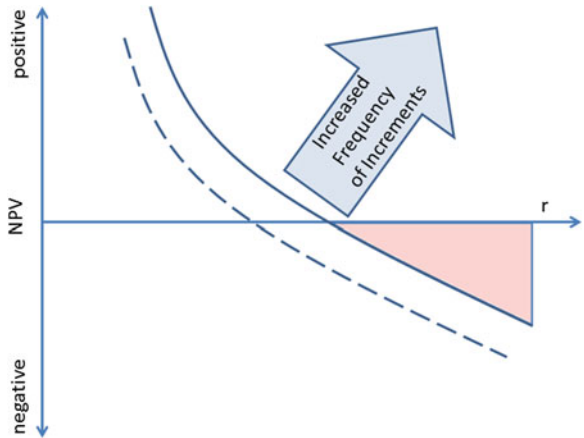


Fig. 3.3 Net Present Value Profile for an Agile Project. Published with kind permission of © Alan Moran 2015

or in other words an amount NPV_i today invested in a compounded fashion for i periods of time at rate r would accrue in value to CF_i which is just an algebraic reformulation of the above expression. Note that the expected rate of return is assumed to remain constant throughout and if this rate is annualised but the periods over which cash flows are measured are not, then the value of r needs to be appropriately adjusted.⁷ The net present value for the project is the sum of all net present contributions of future cash flows as indicated in Fig. 3.2.

Figure 3.3 illustrates the NPV profile (i.e., a graph of project NPVs over a possible range of rates of return) for an agile project with an initial investment, project and post-project net cash flows over the finite lifetime of the solution but excluding decommissioning costs.⁸ Analysis of the capital budgeting structure indicates that

⁷ By way of example an annualised rate of return, r , equates to a compounded monthly rate of return of $1 - (1 - r)^{\frac{1}{12}}$.

⁸ Decommissioning costs for some projects can be sufficiently significant to alter the shape of the NPV profile e.g., costs of taking a nuclear plant out of operation.

the NPV profile is influenced by the frequency of delivery of revenue generating increments and the distribution of benefits that each enables. This suggests that prioritising the most valuable increments first and releasing on a frequent basis will positively impact return on investment. Moreover, this also has the effect of pushing up the internal rate of return for an agile project which means that the decision to invest in such projects may continue be taken under increasingly more demanding expected rates of return thereby diminishing the basis for rejection of project proposals (see the shaded region of Fig. 3.3). By contrast a traditional project that delivers all its benefits on completion of the project (indicated by the dashed line in Fig. 3.3) fares less well and cannot be accepted at higher rates of return.

Another feature that emerges from agile project appraisal is the ability to continually assess return on investment with each increment delivered and to seek validation from the marketplace on the achievement of project objectives. Thus if a project does not appear to be meeting its targets then this feedback can provide validated grounds for cancelling a project rather than committing additional funds needlessly. This requires that there is adequate governance in place (e.g., the use of review points and benefits assessments exercises as outlined in Chap. 6) and that an incremental approach to determining return on investment is included (i.e., computation based on cumulative gains and costs of each increment using realised accounts once these figures have become available). Thus Agile in combination with appropriate governance and financial appraisal approaches provides a means of risk managing the delivery of value [101]. For example, there may come a point in the project where a decision must be made as to whether or not to continue (see the circle in Fig. 3.4) by which time certain benefits have already been realised. Thereafter the solution may remain in service (albeit without further development) and continue to accrue benefits, though it cannot be ruled out that market forces will not act in an adverse manner (e.g., a deterioration in the prospects of the target segment or entrants of

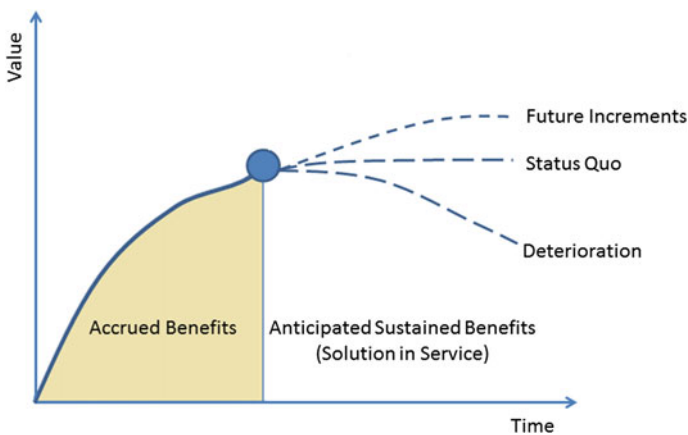


Fig. 3.4 Agile Value Curve. Published with kind permission of © Alan Moran 2015

new competitors with alternative solutions). On the other hand, a decision may be made to continue the project leading to a new increment that may offer additional new net benefits though owing to the prioritisation of value these are likely to be marginal when compared to those benefits already gained. Thus in the context of agile projects it makes sense to continually seek validation for ongoing efforts and to question whether or not there are opportunity costs involved by not engaging in other ventures. Either way, this is the point at which future investments must be reassessed against anticipated rates of return in order to determine if the pursuit of new value is still warranted.

3.5 Agile Contracting and Pricing Models

Inspired by the need to have certainty before committing to an undertaking many contractual arrangements fail to acknowledge the need to incorporate room for learning in projects. Consequently traditional approaches have focused on creating full up-front specifications replete with estimates on the basis of which costing or pricing is to be determined. This places considerable restriction not only on necessary changes that arise as a clearer understanding of project objectives and tasks is gained but also the changing circumstances of the external environment that may force a re-evaluation of the premises on which the project is based. Agile contracting, a topic about which most methodologies are surprisingly mute, must therefore address such matters in a manner that protects the flexibility of the underlying methodology but also points to obligations rather than pre-defined rigid outcomes. Such contracts may place more emphasis on the project outcome and vision, accommodation of learning, governance and risk and the nature of relationships and practices in the project. For example, there may be requirements concerning the formulation of acceptance criteria and obligations in terms of their verification and validation. Finally there should be a capping of total costs and an exit mechanism for situations where the contractual flexibility is unable to cope with conflict resolution.

There are many candidate pricing models available several of which are applicable to agile environments with only minor adaptations. For example, pricing based on time and materials is common and requires no alteration for agile projects whereas unit based pricing merely needs to be framed in appropriate terms (e.g., user story or epics). Alternatively more creative practices can be applied such as linking pricing to the delivery of value based on the end-usage of the increment. Where fixed priced models are applied it is common to add a risk buffer (e.g., ten percent of costs) to cater for unanticipated change which might be linked to team level metrics (e.g., velocity). There is, however, a prevailing view in the agile community that fixed-price contracting is incompatible with the agile approach though much of this criticism is linked to the manner in which scope becomes a fixed project parameter. Using the DSDM approach (as described in Chap. 4), it is, however, possible to fix quality, time and price but leave scope a variable. This admits sufficient flexibility with which to build trust between client and supplier especially given that progress can

be tracked at the incremental level with a sufficiently robust governance and risk management framework. Thus the resolution of the fixed-price dilemma requires more than simply adapting the existing contracting culture and involves ensuring that adequate structure and governance is in place in the agile environment.

3.6 Management Implication

Agile has implications well beyond the technocentric circles of solution development that impinge on how management is understood in terms of performance and financial accountability. It finds resonance with the Beyond Budgeting movement that challenges the traditional budget process on grounds comparable to those that seek to question traditional product development. Together both contribute significantly to the debate on how an organisation should align values, efforts and rewards.

From an accounting point of view the need to categorise costs (e.g., capital and operational expenditure) can impose significant burdens on agile teams that threaten to reduce their value generating potential. Some methodologies, however, admit the possibility of structural classification of costs that may be in line with wider accounting guidelines and practices (e.g., DSDM phased model and structured Timeboxes) thereby offering a non-intrusive means of accounting for costs. Such matters are important only insofar as profitability features in the assessment of Agile (e.g., use of profitability index as a project appraisal technique) though care needs to be taken to ensure these are not conflated with other stakeholder concerns (e.g., investors' desire not to overstate profit by using capitalisation charges or internal wishes to use operational expenses to reduce tax burdens). The use of net present value calculation of anticipated future net cash flows based on percentage enablement of benefits (without reference to accounting constructs) therefore remains a sounder means of appraising agile projects.

An analysis of NPV profiles of agile projects suggest that from a financial perspective prioritisation of value and delivery of frequent (revenue generating) increments afford higher rates of return, contribute positively to the bottom line and improve return on investment metrics. Furthermore, the validity feedback enables sound decision-making in respect of continuation of projects assessed in the light of whether or not the anticipated new net benefits are in line with expected rates of return or if the opportunity costs of deploying teams elsewhere would suggest otherwise. Indeed this is a central principle of the DSDM approach (see Chap. 4) that advocates focus on business need together with on-time delivery. Finally, proactive governance and risk management measures ensure an appropriate balance of risk and reward throughout the project. This enables threats and opportunities to be identified and managed appropriately thereby avoiding wasteful deployment of resources and enabling exploitation of emergent opportunities. Avoiding locking funds in projects that delay the timing of cash inflows means that smaller amounts of funds can be distributed more effectively over multiple projects though the promise of a multiplier effect wherein projects achieve paybacks within the solution development period are

perhaps less convincing in all but exceptional cases. This, notwithstanding, the primary objective of maximisation of value and continual pursuance thereof can still be better achieved by the approach and frameworks offered by agile environments.

Most discussions concerning agile contracting remain framed by the traditional concept of a Waterfall style process wherein feasibility, specification and estimation provide the basis for contractual terms and conditions. This is a search for a false sense of security that is resolved by adapting existing contractual frameworks and pricing models to reflect the reality of uncertain outcomes, changing business environment and the necessity of cultures of trust and learning. Amending such arrangements requires an agile environment that supports iterative compliance measures and thus can only be achieved within an appropriate governance and risk management context. Ultimately, however, the success of project can seldom be found in a tightly worded contract but rather in the trust and integrity built up in the relations of the primary participants derived from a focus on business need, on-time delivery of quality solutions and continuous communication and collaboration.

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