

Driving Project Performance with a Collaborative Definition of KM

Kersti Nogeste

Principal Consultant, Project Expertise Pty Ltd

Melbourne, Australia

and

Doctor of Project Management candidate, RMIT University

Melbourne, Australia

Email : knogeste@projectexpertise.com.au

Abstract

Achievement of organisational strategic objectives is dependent on the development and management of both tangible and intangible assets, with an increasing need for the improved management of intangibles. Therefore with organisational strategic objectives driving project objectives and outcomes, it can also be expected that there will be an increasing reliance on projects to deliver a combination of tangible and intangible outcomes, including knowledge outcomes. With outcomes in turn expected to generate benefits.

Expected project outcomes and benefits can be used to define project success criteria. However, the means by which stakeholders assess project success vary. So, project stakeholders can improve the likelihood of agreement about project success by collaborating to identify and define project outcomes, including intangible project outcomes such as knowledge.

The method described in this paper provides project stakeholders with an efficient, effective, repeatable means of identifying and defining intangible project outcomes including knowledge, by applying a combination of project management, knowledge management and benefits management principles.

The method has been developed as a result of doctoral research case studies that respond to the call for improved visualisation, measurement and management of intangibles within companies. Readers are encouraged to also respond to this call by applying and refining the method on their own projects.

INTRODUCTION

Definitions

For the purposes of this paper, knowledge is considered an intangible asset/outcome, and the term "expected project KM outcome/s" is used to refer to "expected project knowledge outcome/s".

The paper specific definitions are based on the following broader definitions :

- A tangible (asset/outcome) is one in which "the primary value is in the physical artefact. It is the value of the artefact that distinguishes it from other products. A new building is an example of this type of asset" (Wideman 2001).
- An intangible (asset/outcome) is one in which "the value is in its intellectual property. Although there is some physical result, this is not the essence of the asset. The essential feature is new information and its physical aspect is only a vehicle for its conveyance and transformation" (Wideman 2001).
- According to Guthrie, "often the terms, intangibles, knowledge resources and intellectual capital are used to refer to almost the same concepts" (Guthrie 2003).

An Increasing Focus On Intangibles

Organisations increasingly recognise that achievement of their strategic objectives including maintaining and improving their competitive advantage is dependent on the development and management of both their tangible and intangible assets.(Future & Innovation Unit 2001,p1) Intangible assets currently considered to significantly influence an organisation's future include relationships, knowledge, leadership and communication, culture and values, reputation and trust, processes, skills and competencies.(Future & Innovation Unit 2001,p3)

Whilst recognising that "case studies and cross-sectional analyses have provided evidence that intangibles are the fundamental source of competitive advantage for business firms in most industries." (Garcia-Ayuso 2003, p598), it is also acknowledged that this successful management is reliant upon "a new managing approach where intangibles are in the limelight" (Guthrie 2003, p430) and that this form of successful management is reliant on continuing work by researchers and business managers, to develop, implement and disclose methods for the visualisation, measurement and management of intangibles within companies (Garcia-Ayuso 2003, p602).

It is therefore the purpose of this paper to contribute to this need for continued work by describing how intangible project outcomes, and project KM outcomes in particular, can be better visualised (identified and defined), measured and managed (delivered).

Planning For Project Success

The means by which stakeholders assess project success vary. They may refer to different sets of data, or even when referring to the same set of data, interpret it differently, according to their particular perspective, potentially leading to different assessments of the project's success. (Rad 2003,p23)

So, project stakeholders can improve the likelihood of common agreement about project success, including the delivery of a project's expected KM outcomes by collaborating to clearly define and communicate project objectives and outcome success criteria. In addition, project managers and their team members need to ensure that project resources and activities generate deliverables that align with the outcome success criteria so that their efforts satisfy the project objectives.

Expressed in this way, the stakeholder defined project objectives and outcome success criteria provide a top-down perspective of the project and the project team defined activities and deliverables provide a bottom-up perspective of the project. To ensure alignment of both perspectives, the project objectives, outcome success criteria, deliverables and activities need to be linked together. These linkages can be depicted in terms of a hierarchy or network model, with the project objectives at the top of the model, followed in turn by project outcomes, deliverables and the activities and resources that generate them.

Sample network/hierarchy models include the definitions provided by the Guide to the Project Management Body of Knowledge (PMBOK Guide), the logical framework method (LFM), the definitions provided in the UK Treasury department's "Green Book" and two models proposed by Ward and Elvin (refer Appendix 1 for further details).

The principles of these models are summarised in the following diagram :

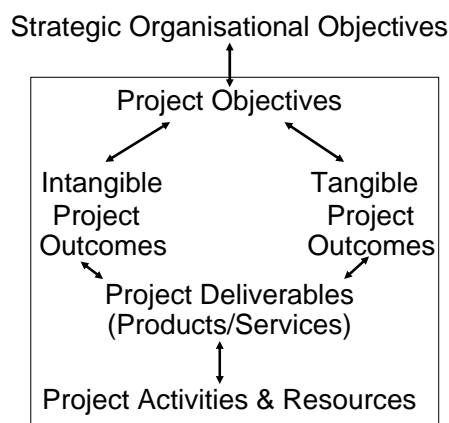


Figure 1: Project Hierarchy Model

Outcomes And Benefits

The relationship between outcomes and benefits warrants particular attention because the practice of benefits management has been identified as an increasingly important (HM Treasury 2003,pv) complementary practice to project management which whilst often neglected (Ward 1999,p198) is capable of contributing directly to project success (Ward 1999,p198).

The UK Office of Government Commerce (OGC) definition of benefits management is "the identification of potential benefits, their planning, modelling and tracking, the assignment of responsibilities and authorities and their actual realisation as a result of investing in business change". ((OGC) 2003) In these terms, a project can be considered a "business change investment", with benefits management placing increased focus on projects delivering the outcomes and related benefits required to achieve project objectives. Focussing attention on benefits highlights the role of project deliverables as a means of achieving specific benefits, rather than the deliverables being "ends" in themselves. (Kippenberger 2000,p29)

So, with reference to the abovementioned models, benefits management provides the means of identifying, defining, managing and monitoring the links between project benefits and project deliverables (because deliverables are used or operated and hence deliver benefits). (Reiss 2000)

The following diagram illustrates the relationship between project deliverables, outcomes and benefits :

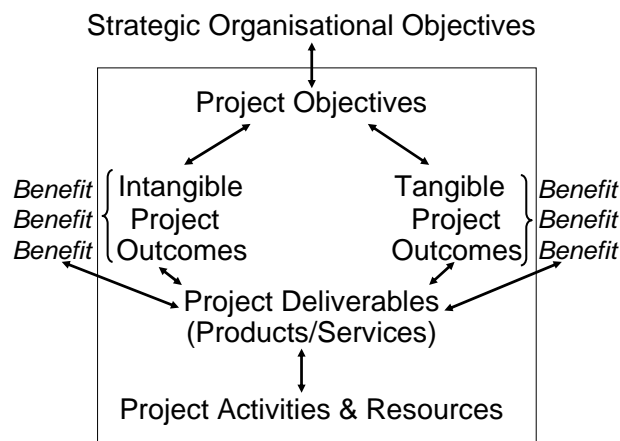


Figure 2: Project Hierarchy Model including Benefits

The initial benefits management step of identifying and defining benefits results in the development and documentation of a benefit profile (Kippenberger 2000,p28) (Reiss, slide 8) that includes a definition statement and identifies the owner, benefits realisation schedule, means of measurement, financial valuation, dependencies and risk estimates.

The collection of documented benefits profiles provides a baseline for informed monitoring (Rad 2003,p23) so that progress towards achieving project benefits and objectives can be managed with the same rigour as costs. (Kippenberger 2000,p28)

Once the benefit profiles are defined, a benefits management strategy should be defined to ensure ongoing benefits management, including assignment of planning, monitoring and realisation responsibilities (Kippenberger 2000,p29). Because of the reliance on operational staff for post-project benefits to be realised/maintained, responsibilities should be assigned to a combination of project and operational staff. (Kippenberger 2000,p29)

Aligning Project Knowledge Management Outcomes

A number of authors (Christensen and Bang 2003, Chua 2003, Dawson 2000, Lang 2001, Martensson 2000) refer to the strong link between an organisation's strategic objectives, its approach to KM and expected KM benefits. Therefore, it can be inferred that based on these references, the relationship between a project's KM objectives, outcomes, deliverables, activities and resources could be defined according to the project hierarchy model proposed above.

An organisation's approach to knowledge management may take a number of forms, depending on the perspective taken. Two sample theoretical perspectives are

- i) The individualistic (Martensson 2000, p213) or personalised (Christensen 2003, p118)
- ii) The holistic (Martensson 2000, p213) or codified (Christensen 2003, p118)

Where the individualistic and personalised perspective focuses on an individual's knowledge (Martensson 2000, p213) and how it is transmitted from one individual to another, and may therefore be managed by an organisation encouraging the creation and sharing of knowledge via social networks, mentors and open/informal meeting areas (Christensen 2003, p118). The holistic and codified perspective focuses on the knowledge itself (Martensson 2000, p213) and does so, by providing a "framework and structure of knowledge sharing" based on the premise that it is preferable for explicit knowledge be to be shared and not belong to individuals (Christensen 2003, p118).

These perspectives may in turn also influence an organisation's definition of KM to be biased towards either information or knowledge management, where information management (the management of digitised information) can be considered to be a subset of knowledge management, "which deals with all aspects of how people in organisations are enabled in performing knowledge-based functions" (Dawson 2000, p321).

So, an organisation's KM perspective will influence its KM strategy, objectives and processes and outcomes and also in turn, those of its projects. Therefore it is important for project stakeholders to clearly define KM within the project context. This is a means of ensuring that the project's KM objectives and outcomes align with those of the larger organisation, since only relevant objectives and outcomes will provide the organisation with the expected benefits (Martensson 2000, p214).

In summary, organisations rely on projects to deliver a combination of tangible and intangible outcomes that support organisational strategic objectives and define project success criteria. However, the means used by project stakeholders to assess project outcomes varies. So, to increase the likelihood of common agreement about project success, project stakeholders should collaboratively define project success criteria, including intangible project outcomes such as knowledge.

The remainder of this paper describes an efficient, effective, repeatable method for identifying and defining intangible project outcomes, with a particular focus on knowledge. The documented project outcomes provide both an input to a benefits management strategy and a means of aligning project activities and resources to deliver the associated project deliverables.

A METHOD FOR IDENTIFYING AND DEFINING INTANGIBLE PROJECT OUTCOMES, INCLUDING KM

Overview

Based on the author's experience to date with a number of doctoral level research case study projects, the recommended method for identifying and defining project KM outcomes comprises the following steps :

- i) Identify Stakeholders
- ii) Schedule & Conduct Introductory Meeting
- iii) Conduct Workshop
 - Identify and Prioritise Project KM Outcomes
 - Define Project KM Outcomes
- iv) Link Project KM Outcomes to Project Deliverables
- v) Define/Review Project Deliverables

Identify Stakeholders

The initial step is to identify the stakeholders who will be responsible for identifying, prioritising and defining the project's KM outcomes. The stakeholders should include the project sponsor, key stakeholders including project steering committee members and "resource managers" (those people assigning their staff to the project) and operational staff representatives. Operational staff representatives should be included in this group because they will be responsible for ensuring the ongoing realisation of benefits delivered by project KM outcomes.

Schedule & Conduct Introductory Meeting

Based on the author's research findings, it is recommended that a meeting be scheduled with the stakeholder group to review, discuss and agree upon :

- i) The hierarchical relationship between project objectives, tangible and intangible project outcomes (including KM), their benefits and project deliverables.
- ii) Project success being somewhat dependent on the delivery of intangible project outcomes, including KM outcomes.
- iii) Benefits profiles providing an acceptable means of documenting intangible project outcomes, including knowledge..
- iv) A date, time and place to conduct the workshop, that comprises the following two steps:
 - Identify and Prioritise Project KM Outcomes
 - Define Project KM Outcomes

Based on the author's research findings, it is recommended that

- i) Both the introductory meeting and follow-on workshop be scheduled as agenda items of the stakeholder group's regular meetings. This approach will increase the likelihood of stakeholder attendance and also send a clear message that the identification and definition of project KM outcomes is part of the group's operating agenda (Thornbury 2003). If the stakeholder group does not meet regularly, then special purpose meetings will be necessary.
- ii) The introductory meeting and workshop be conducted at separate times to allow project stakeholders time to think about project outcomes prior to the workshop.
- iii) A workshop be conducted, rather than project stakeholders being individually interviewed. If the stakeholders are interviewed individually or as sub-groups, their priorities may vary and the facilitator is then posed with the challenge of reconciling the various stakeholder priorities as well as consolidating individual stakeholders' feedback. In the author's experience it has been found to be far preferable to meet the stakeholders as a group, in terms of both generating common project specific definitions of project outcomes and doing so efficiently.

Conduct Workshop

The two-step workshop is expected to generate descriptions of as many project KM outcomes as can be discussed during the available workshop time. These descriptions comprise an input into the project management activities and also the project/organisation benefits management strategy, if it exists.

If it is not possible to collect all of the required information for every project KM outcome during the workshop, then follow-up action items need to be documented and agreed, including who is responsible for providing what information to whom and by when.

Identify and Prioritise Project KM Outcomes

The purpose of this initial step is for project stakeholders to name, briefly describe and prioritise the expected project KM outcomes. The KM Outcome Names and brief KM Outcome Definition Statements defined in this step are used as the basis of the expanded definitions completed in the following step. The main reason for prioritising the outcomes is to ensure that the remainder of the workshop focuses on the KM outcomes of greatest importance to the project.

When identifying project KM outcomes, project stakeholders could choose to consider the following

- i) The organisation's KM perspective e.g. individualistic/personalised or holistic/codified;
- ii) In the absence of a consistent organisational KM perspective, what the project specific KM perspective will be, and from that derive project KM outcomes;
- iii) Whether the outcomes are information management or knowledge management outcomes;
- iv) Depending on the KM perspective, whether the outcomes will relate to one or both explicit and tacit knowledge (recognising that a complete approach to KM needs to address both). Within a project context of limited duration, stakeholders should acknowledge that accumulated experience indicates that it is generally easier to focus on the management of explicit knowledge, rather than tacit knowledge. KM "quick hits" will be more achievable from management of explicit knowledge,

rather than the management of tacit knowledge. Therefore, given the temporary nature of projects, project stakeholders also need to consider the elapsed time available to achieve project KM outcomes. Although this does not mean that the management of tacit knowledge should be ignored – but it must be recognised that it is more difficult to implement tacit knowledge management. (Heath 2003) The recommended means of managing tacit knowledge vary from Heath's recommended step-wise approach (Heath 2003), where a schema is used to capture tacit knowledge (e.g. www.dublincore.org), through to Kreiner's proposal (Kreiner 2002, p113). that tacit knowledge is best managed “in tacit ways” rather than in “conventional terms”.

- v) Whether project KM outcomes are to benefit only the organisation's operations or both its operations and planned and existing projects. (Disterer 2002, p513)

Define Project KM Outcomes

The project stakeholders then use the following list of sample benefits profile criteria to define each project KM outcome :

- i) KM Outcome Name
- ii) Outcome Definition Statement
- iii) Owner (Beneficiary)
- iv) Benefit Description
- v) Benefits Realisation Schedule
- vi) Roles and Responsibilities
- vii) Measures
- viii) Required Project Deliverables
- ix) Dependencies
- x) Risk Assessment
- xi) Financial Summary

i) KM Outcome Name and Outcome Definition Statement

The KM Outcome Name and Outcome Definition Statements are outputs of the previous workshop step.

ii) Owner (Beneficiary)

Benefits profiles conventionally identify a single “management” owner. However, ownership of project KM outcomes needs to be considered from the perspective of the knowledge workers who care about the knowledge and own the means of producing (Kreiner 2002) and/or using the knowledge (Lang 2001).

iii) Benefit Description

Stakeholders should decide if the benefits of the project's KM outcomes are to improve the organisation's operational efficiency or to provide a long-term strategic advantage. (Heath 2003)

iv) Benefits Realisation Schedule

From a project perspective this schedule is important, since it will highlight the short and mid-term benefits expected to be delivered within the intentionally limited duration of the project and also the longer term benefits that will rely on project stakeholders other than the project team, to be realised.

v) Roles and Responsibilities

e.g. Staff members assigned to a project as user/business representatives, provide the project with a means of transferring existing and new/changed knowledge between the sponsoring organisation's operational units and the project. (Disterer 2002, p514)

vi) Measures

The American Productivity and Quality Center (APQC) considers there to be three main types of KM measures (APQC 2001).

- Anecdotal e.g. war stories, success stories
- Quantitative e.g. growth

- Qualitative, often extrapolation of anecdotal measures.

The APQC recommends the following forms of measurement for organisations in the relatively early stages of KM implementation (APQC 2001).

- Knowledge sharing measured by the number of presentations to senior management and/or other internal/external forums or articles in in-house journals or newsletters.
- Quantitative and qualitative responses to the above presentations

The APQC suggests that organisations at a more advanced state of KM implementation apply the following six measures to demonstrate direct business value (Cent 2001b) :

- Business value
- Retention, retrieval and reuse of knowledge contributed by the project to the organisation's knowledge base.
- Cultural impact e.g. Storytelling, number of KM related nominations for reward and recognition awards and also the granting of these awards.
- Effectiveness of sharing communities e.g. Communities of practice
- Economic viability of KM processes
- Project management effectiveness and intended results

vii) Required Project Deliverables

As with all other aspects of the outcome definition, the prevailing KM perspective will also guide the definition of required project deliverables. Sample project deliverables that will support the flow of knowledge between a project, its sponsoring organisation's operational units and other projects, include (Disterer 2002, p515-518):

- Documented lessons learned;
- A project profile;
- Project issues log (including documented resolutions and resolution timeframes);
- Project team members' contact details (during and after the project);
- Contact details of individuals and organisations (e.g. professional organisations) external to the sponsoring organisation who assisted the project to meet its objectives;
- Employee Learning Contracts, driven by employees' professional development goals (Isaacs 2001), (Sullivan 2001) ;
- Contract staff project exit plans that describe how knowledge gained by contract staff will be passed on to the sponsoring organisation's employee/s prior to the contract staff departing from the project/organisation (Stainsby 2001).

viii) Dependencies

The realisation of dependencies can 'make or break' the delivery of project outcomes. Therefore it is important for them to be given due consideration. Project stakeholders may wish to consider the following dependencies :

- If knowledge is to be shared between the project, sponsoring organisation and other planned or existing projects, there will be a dependency on project team members having access to operational and/or other project personnel, processes or systems (Disterer 2002, p512-515).
- Verbal communication competencies capable of supporting the useful flow of tacit knowledge e.g. metaphors (Lang 2001).

ix) Risk Assessment

A relatively simple means of conducting the risk assessment is to assess the effect, impact and probability of each dependency not being realised and then define contingent or mitigative actions to reduce the risk.

x) Financial Summary

As for the definition of non-financial measurement criteria, project stakeholders need to be aware that the definition of the financial summary will be dependent on the organisation's KM maturity.

For organisations in the early stages of KM maturity, the American Productivity and Quality Centre (APQC) recommends that KM related Return on Investment (ROI) be "captured indirectly and by extrapolation" (APQC 2000, p11) and that as per the APQC's Best Practice Report (APQC 2000, p8, p11) "ROI calculations alone are not enough to institutionalise KM as a way of working", so that it is necessary for project stakeholders to support KM as a "calculated leap of faith... not purely a return on investment (ROI) calculation."

To guard against cynicism that project stakeholders might express towards these recommendations, it is important that project KM outcomes are "inextricably linked to improving the business" (APQC 2001a, p11).

Link Project KM Outcomes To Project Deliverables

This post-workshop step of the method links the priority KM outcomes defined in the workshop to project deliverables.

If the method is used in the planning stages of a project, then it will assist the delivery of project KM outcomes to be integrated into the development of project deliverables. If the method is used to review project deliverables, it will assist to evaluate the delivery of project KM outcomes by project deliverables.

Refer to Appendix 2, which is a sample form used by the author to cross-reference intangible project outcomes including KM outcomes, to project and operational deliverables.

Define/Review Project Deliverables

Having linked project KM outcomes to one or more project deliverables, each of the deliverables needs to be defined/reviewed in turn, depending upon whether the method is being used to plan or review project outcomes.

This is the point in the method where standard project management practices are engaged to define/review the activities required to generate each project deliverable, along with the resources required to support the activities such as skill level, time and available budget.

CONCLUSION

Achievement of organisational strategic objectives is dependent on the development and management of both tangible and intangible assets, with an increasing need for management methods that will assist intangible assets, such as knowledge to be visualised, measured and managed.

The method described in this paper, responds to this need by providing project stakeholders with an efficient, effective, repeatable method for identifying and defining (visualising), measuring and delivering (managing) intangible project outcomes including knowledge, by applying a combination of project management, knowledge management and benefits management principles.

REFERENCES

- American Productivity and Quality Center (APQC). (2000). Successfully Implementing Knowledge Management - Best Practice Report - Executive Summary. Last Accessed: 5 January 2004. http://www.apqc.org/portal/apqc/ksn/SIKMexsum.pdf?paf_gear_id=contentgearhome&paf_dm=full&pageselect=contentitem&docid=102668
- American Productivity and Quality Center (APQC). (2001a). Embedding KM : Creating a Value Proposition. Last Accessed: 4 January 2004. http://www.apqc.org/portal/apqc/ksn/Embedding%20KM.pdf?paf_gear_id=contentgearhome&paf_dm=full&pageselect=contentitem&docid=106883
- American Productivity and Quality Center (APQC). Measurement for Knowledge Management. Last Accessed: 4 January 2004. http://www.apqc.org/portal/apqc/ksn/Measurement%20for%20KM.pdf?paf_gear_id=contentgearhome&paf_dm=full&pageselect=contentitem&docid=106946

- Baccarini, D. (1999). "The Logical Framework Method for Defining Project Success." Project Management Journal **30**(4): 25-32.
- Christensen, K. S. (2003). "Knowledge management in a project-oriented organization : three perspectives." Journal of Knowledge Management **7**(3): 116-128.
- Dawson, R. (2000). "Knowledge capabilities as the focus of organisational development and strategy." Journal of Knowledge Management **4**(4): 320-327.
- Disterer, G. (2002). "Management of project knowledge and experiences." Journal of Knowledge Management **6**(5): 512-520.
- Future & Innovation Unit (2001). *Creating Value from Your Intangible Assets*. London, UK, Department of Trade and Industry (UK): 38.
- Garcia-Ayuso, M. (2003). "Intangibles - Lessons from the past and a look into the future." Journal of Intellectual Capital **4**(4): 597-604.
- Guthrie, J. (2003). "Intangibles and the transparent enterprise : new strands of knowledge." Journal of Intellectual Capital **4**(4): 429 - 440.
- Heath, J. (2003). "Harvesting and using corporate knowledge." Work Study **52**(4): 184-189.
- HM Treasury, U. (2003). *The Green Book - Appraisal and Evaluation in Central Government*. Last Accessed: 6th August, 2003. <http://greenbook.treasury.gov.uk/>
- Isaacs, J. (2001) Meeting on 12th September, 2001 regarding Contracts and intangibles
- Kippenberger, T. (2000). "Managing the business benefits." The Antidote(27): 28-29.
- Kreiner, K. (2002). "Tacit knowledge management : the role of artefacts." Journal of Knowledge Management **6**(2): 112-123.
- Lang, J. C. (2001). "Managerial concerns in knowledge management." Journal of Knowledge Management **5**(1): 43-57.
- Martensson, M. (2000). "A critical review of knowledge management as a management tool." Journal of Knowledge Management **4**(3): 204-216.
- Office of Government Commerce (OGC, UK) (2003). *Successful Delivery Toolkit - Benefits Management*. Last Accessed: 6th August 2003. <http://www.ogc.gov.uk/sdtoolkit/workbooks/benefits/benefitsmgt.html>
- Project Management Institute (PMI) (2000). A Guide to the Project Management Body of Knowledge. Newtown Square, Pennsylvania, Project Management Institute.
- Rad, P. F. (2003). "Project Success Attributes." Cost Engineering **45**(4): 23-29.
- Reiss, G. Project Selection and Benefit Management. <http://www.e-programme.com/download/consortium%20intro.ppt>, ProgM, The joint Specific Interest Group in Programme Management of the Association for Project Management and the British Computer Society.
- Reiss, G. A. (2000). *Benefit Management - A Paper for Congress 2000*. Last Accessed: 13 November 2001. http://www.e-programme.com/articles/benefit_management.htm
- Stainsby, T. (2001) Meeting on 4th September, 2001 regarding Contracts and intangibles
- Sullivan, J. (2001) Meeting on 23rd August, 2001 regarding Contracts and intangibles
- Thornbury, J. (2003). *Creating a living culture: the challenges for business leaders*. Corporate Governance. **3**: 68-79.
- Ward, J. (1999). "A new framework for managing IT-enabled business change." Information Systems Journal **9**(3): 197 - 221.
- Wideman, R. M. (2001). *Wideman Comparative Glossary of Project Management Terms v2.1*. Last Accessed: 22 November 2003. http://www.pmforum.org/library/glossary/PMG_O01.htm

APPENDICES

Appendix 1 – Project Network/Hierarchy Models

PMBOK Guide

The PMBOK Guide defines project objectives, outcomes and deliverables as follows :

- Project Objectives are the quantifiable criteria that must be met for the project to be considered successful. Each quantifiable criteria includes an attribute (e.g. cost), metric (unit of measure), and is expressed either as a single value or range of values. (PMI 2000,p56)
- Project Outcomes are either tangible or intangible. The examples cited by the PMBOK Guide are tangible outcomes such as buildings and roads and intangible outcomes such as people who can effectively apply their training. (PMI 2000,p47)
- Project Deliverables are "any measurable, tangible, verifiable outcome, result or item that must be produced to complete a project or part of a project". (PMI 2000,p200)

So, according to this hierarchy, the objectives should be quantifiable, the outcomes may be tangible or intangible and the deliverables are tangible.

It can be expected to be relatively straightforward to link (tangible) deliverables to tangible outcomes and quantifiable objectives. However, it can be expected to be more challenging to link (tangible) deliverables to intangible outcomes and quantifiable objectives.

Logical Framework Method

The logical framework method (LFM) was developed by the American Aid Agency in the 1970s as a means of improving the management of development projects and is described by Baccarini (Baccarini 1999, p26-27) as comprising four levels of objectives - goal, purpose, output and input, where each of the levels is defined as

1. Project Goal Objective, where the project goal is supportive of an organisation's strategic goals.
2. Project Purpose Objective, which provides both a means towards the project goal and also of defining project outputs.
3. Project Output Objective, which is "the immediate, specific and tangible results or deliverables produced by project activities. The outputs explain what the project will produce".
4. Project Input Objective, which is a combination of the resource inputs and activities required to generate the outputs.

According to Baccarini the initial two levels of the hierarchy - Project Goal and Project Purpose "together explain why the project is being undertaken". (Baccarini 1999,p26)

Baccarini describes the LFM as a "how-why" logic chain, with each level of the hierarchy linked together by a combination of the two questions "How is this to be achieved ?" and "Why is this to be achieved?". The first of these questions helps build the lower levels of the hierarchy and the latter question helps to verify the hierarchy, when passing back towards the top.(Baccarini 1999,p27) The asking and answering of these questions, provides both a "step by step conceptualisation of the important elements of a project" (Youker as cited by (Baccarini 1999,p27) and also a clear demonstration of cause-and-effect by confirming that "the hierarchical relationships between the project objectives are logical and viable" and support the strategic goals of the organisation. (Baccarini 1999,p27)

According to Baccarini, the project goal and purpose are defined by senior management responsible for the project, with the project team being responsible for reviewing the project goal and purpose in terms of their linkages to project outputs and inputs. (Baccarini 1999,p27)

UK Treasury Department "Green Book"

The UK Treasury department's "Green Book" (Appraisal and Evaluation in Central Government) describes the relationship between objectives, outcomes, outputs and targets (measures) as a hierarchy. Where objectives are expressed in terms of outcomes, which "sometimes cannot be directly measured". Outcomes are expressed in terms of outputs which are "the results of activities that can be clearly stated or measured" and relate "in some way" to the desired outcomes. Targets define the measures used to assess the outputs.(HM Treasury 2003,p13) This hierarchy is consistent with the PMBOK Guide in that the intermediate layer of

"outcomes" may not always be able to be measured and can be inferred to correspond to the intangible outcomes referred to in the PMBOK Guide.

Ward and Elvin's Models

Initially, Ward and Elvin also propose a linear model that describes intent/objectives, outcomes (and their benefits) and content (changes) as being linked together in sequence, with content/changes delivering outcomes that in turn achieve benefits that satisfy the intent/objectives. (Ward 1999,p202) They then enhance this linear model so that it becomes a "benefits dependency network" capable of depicting many-to-many relationships between content, (enabling and business) changes, benefits and objectives. (Ward 1999,p212) In both of Ward and Elvin's models, benefits provide a detailed description of the implied outcomes. (Ward 1999,p210).

Appendix 2 - Outcome To Deliverable Cross Reference

KM Outcome Name	Outcome Definition Statement	Project Deliverables						Operational Deliverables						
		PD 1	PD 2	PD 3	PD 4	PD 5	PD 6	OD 1	OD 2	OD 3	OD 4	OD 5	OD 6	

AUTHOR DETAILS

Kersti Nogeste (knogeste@projectexpertise.com.au) is a doctoral candidate at RMIT University (Melbourne, Australia) and an independent consultant project manager with industry experience gained in Australia and North America.

This paper is based on Kersti's recent research case studies that have generated an efficient and effective, repeatable method for project stakeholders to use, to identify and define intangible project outcomes, such as knowledge.

The research case studies were conducted with an Australian water utility, the Victorian state government Victims Referral and Assistance Service (VRAS), Victoria Police, the Shire of Campaspe and Campaspe Primary Care Partnership (PCP). Kersti is currently writing up her thesis for presentation later in 2004.

COPYRIGHT

Kersti Nogeste © 2004. The author assigns to SAI Global and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The author also grant a non-exclusive licence to SAI Global to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the author.