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The Ergonomy of Communication in Project Management

*The Case for an Integrated
Project Management Platform*

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Abstract

This study thesis has the title "The Ergonomy of Communication in Project Management: The Case for an Integrated Project Management Platform". It addresses the intersection between the theoretical study of communication, its adaptation to human psychology and, the context and tools for high-performing project management.

Using a number of examples, the paper explores how the communicating aspect of the tools can be adapted so as to create lasting links between people in support of long-term project management.

The issue of the optimisation of communication is demonstrated by two case studies. These actual management consultancy missions practiced by the author show the extent to which improvements are possible aswell as the positive impact on project performance. They also underline the simplicity of the possible optimisations.

A methodology of approach to the optimisation of project management, called in3co[®], is presented which attempts to formalise the key value of communication.

A conclusion, which can be felt throughout the paper, is the opportunity for the development of a platform which integrates and federates the techniques described with a view to optimising and perpetuating the management of projects in the context of multiple teams.

Synthèse

Ce mémoire s'intitule « L'Ergonomie de la Communication dans la Gestion de Projets : Le Besoin d'une Plate-Forme de Gestion de Projets Intégrée ». Il s'adresse à l'intersection entre les études théoriques de la communication, leur adaptation à la psychologie humaine, et le contexte et les outils de la gestion performante de projets.

En utilisant plusieurs exemples, il explore comment adapter l'aspect communicant des outils afin de créer des liens durables entre les hommes et soutenir une gestion de projet pérenne.

La problématique de l'optimisation de la communication est montrée par deux études de cas. Ces missions réelles de conseil en gestion de projets pratiquées par l'auteur permettent de montrer l'étendue des améliorations possibles ainsi que l'impact positif sur la performance du projet. Elles soulignent également la simplicité des optimisations possibles.

Une méthodologie d'approche à l'optimisation de la gestion de projet, appelée in3co[®], est présentée, et qui tente de formaliser la valeur clé de la communication.

Une conclusion, qui revient tout au long du mémoire, est l'opportunité pour le développement d'une plate-forme intégrant et fédérant les techniques détaillées pour optimiser et pérenniser la gestion de projets dans des contextes à multiples équipes.

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This work is dedicated to Simon and Sarah and to their children, as yet a mere whisper of a concept, whose projects we are consciously and unconsciously preparing and whose future is built on the communication of today.

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Preface

A project is, at its heart, all about communication. The project manager has to communicate requirements, constraints and other criteria to members of the team; people within the project need to keep stakeholders and other interested parties up to date; individuals need to interact with others as they carry out the tasks which, ultimately, add up to the strategic goals of the project. The key to project success is “divide and conquer” – by breaking down a large project into smaller parts, it is possible to achieve great things. However, each level of decomposition results in new dependencies and imposes additional communication requirements.

With good communication, a complex project can succeed in a way that can make people wonder whether it was all too simple. With poor communication, even the simplest of requirements can become impossible to meet. Years ago, when I worked with Jurgen on a number of projects, we saw both situations arise in equal measure. Since then, I worked with a number of people that have taught me that the most profound truths can be the simplest – “keep it simple” is one and, so is “answer the question”. Such truths are simplistic enough to appear trite, even glib; but how often are they forgotten in the heat of the moment, or eroded as a project schedule slips beyond its original timescales.

There is an adage which runs something like, “no war was ever started because of too much communication”. In this paper, Jurgen has documented what is communication, its role in the context of projects and the mechanisms we have available to us. His examples may appear straightforward – the humble email for example, or the telephone conversation – in documenting these, he explains what it is that makes such techniques so useful when other far more powerful technologies have been tried and rejected.

I do not see this as a finished work, though it is complete in itself. This paper is a starting point for exploring, documenting and therefore aiding

the development of how we use technology to communicate, not just in projects but in the wider, collaborative online world that is developing in front of our eyes. His 3-Co models should be used as a reference for anyone approaching the fourth "Co" – that of collaboration, in what Sun's CEO Jonathan Schwartz would call "The Participation Age". In this brave new world, the age-old challenges of language, of relationships and making the most of feedback will not go away, indeed they can only grow in importance. By documenting how things stand today, Jurgen has added to the corpus of knowledge about the essentials of good communication, inside and beyond the project framework. I wish him all the best of luck for the future.

Jon Collins is a Principal Analyst with Macehiter Ward-Dutton. Jon has worked as an IT consultant, network manager and software engineer for companies such as Admiral Management Services Ltd, Alcatel and Philips Electronics. Jon has worked as an industry analyst for over 6 years for companies including Quocirca, Bloor Research and IDC. He has acted as an advisor to leading vendors including Cisco, EMC, IBM and Microsoft, aswell as large IT user organisations in the Government, Telecommunications and Financial Services sectors.

Préface

Un projet tourne avant tout entièrement autour de la communication. Le chef de projet doit communiquer les besoins, les contraintes et autres critères aux membres de l'équipe ; les personnes impliquées sur le projet doivent tenir informées les parties prenantes et d'autres intéressées ; les individus doivent interagir avec d'autres pour accomplir leurs tâches, qui, en fin de compte, constituent les buts stratégiques du projet. La clé du succès d'un projet est de « diviser pour conquérir » – en découpant un grand projet en plus petites parties, il est possible d'accomplir de grandes choses. Néanmoins, chaque niveau de décomposition engendre de nouvelles dépendances et impose des besoins en communication supplémentaires.

Grâce à une bonne communication, un projet complexe peut réussir d'une façon qui peut faire croire que tout était trop simple. En communiquant mal, même le plus simple des besoins peut devenir impossible à satisfaire. Il y a plusieurs années, quand j'ai travaillé avec Jurgen sur plusieurs projets, nous avons rencontré les deux situations à parts égales. Depuis, j'ai travaillé avec plusieurs personnes qui m'ont appris que les vérités les plus profondes peuvent être les plus simples – « il faut que cela reste simple » en est une, également « répondre à la question ». Ces vérités sont suffisamment simples et peuvent paraître banales, voire trop faciles ; mais combien de fois sont-elles oubliées dans le feu du moment, ou rongées au fur et à mesure que le planning du projet glisse au delà des délais prévisionnels.

Il y a un dicton qui ressemble à « aucune guerre n'a été commencée par faute de trop de communication ». Dans ce mémoire, Jurgen a documenté ce qui est la communication, le rôle de la communication dans le contexte de projets et les mécanismes de communication dont nous disposons. Ces exemples peuvent paraître très simples – le modeste mél, par exemple, ou la conversation téléphonique – en les documentant, il explique ce qui rend ces techniques si utiles quand d'autres technologies bien plus puissantes ont été testées et rejetées.

Je n'aperçois pas ce travail comme terminé, même s'il est complet en soi. Ce mémoire est un point de départ dans l'exploration, la documentation et, donc, l'aide au développement des façons dont nous utilisons la technologie pour nos communications, non seulement dans des projets mais dans un monde plus large de collaboration en ligne qui se développe devant nos yeux. Son modèle 3-Co devrait être utilisé comme une référence pour tous ceux qui cherchent le quatrième « Co » – celui de la collaboration, dans ce que le Président de Sun, Jonathan Schwartz, appellera « L'Ère de la Participation ». Dans ce beau nouveau monde, les challenges antiques de la langue, des relations et de la bonne utilisation des informations en retour, ne disparaissent pas mais, au contraire, augmentent en importance. En documentant l'état des choses aujourd'hui, Jurgen a contribué aux connaissances sur l'essentiel de la bonne communication, dans et au delà du cadre des projets. Je lui souhaite bonne chance pour l'avenir.

Jon Collins est un Analyste en Chef chez Macehiter Ward-Dutton. Jon a travaillé en tant que consultant en informatique, responsable réseaux et ingénieur logiciels pour des entreprises telles Admiral Management Services Ltd, Alcatel et Philips Electronics. Jon a travaillé pendant plus de 6 ans comme analyste industriel pour les cabinets Quocirca, Bloor Research et IDC. Il a porté conseil aux grands fournisseurs comme Cisco, EMC, IBM et Microsoft, et également aux grandes structures d'utilisateurs en informatique dans les secteurs du Gouvernement, les Télécommunications et les Services Financiers.

1 Introduction

There is much material about management by project and the facility this brings by breaking down a change process into manageable units. There is also much material which identifies the importance of communication to the success of a project. A mastery of communication is key to anticipating risks and managing unexpected events throughout the life-cycle of a project.

The objective of this paper is to identify how the human aspect of project management communication can be optimised.

Regardless of the technology, communication involves creating links between people. By adapting these links to the human being, that is, by improving the ergonomics of the communication process, project management efficiency is improved and the project experience enriched.

1.1 The Structure of this Paper

The paper begins by analysing aspects of human interaction with respect to the project environment. A model approach for the project manager is presented as well as the advantages of using consultancy in this context.

Practical examples of the application of the project management approach are identified in chapter three. Particular attention is paid to the role of the consultant project manager as facilitator and mediator on projects involving multiple diverse teams and also, to the use of technological means for communication and information processing.

Chapter four is the last of the main chapters and presents the author's experience in applying ergonomic improvements to various aspects of the communication in two recent consultancy missions.

1.2 *The Scope of this Paper*

This paper is not an exhaustive analysis of project management methods but focuses on the adaptation of communication means to the needs of the human participant.

It does not go into the ergonomic details of the Human-Machine Interface, nor does it present a detailed analysis of Communication Theory, Neuropsychology or Behavioural Science.

This paper deals with the *intersection* of these different fields within real-world projects. It deals with the adaptation of technology so that it can be forgotten and we can concentrate on *enabling* project management and bringing *value* to the project results.

2 The Need for Communication in Project Management

This chapter explores some basic features of human interaction and their relation to human cooperation in the accomplishment of projects.

2.1 Why Manage a Project?

The European Union is experiencing a period of unprecedented change requiring the ability to manage change effectively and efficiently^[P13]. This change is accompanied by investment in IT¹ and deployment projects in response to business and social collaboration needs or to enforce governance policies. The complexity of the innovation deployed is ever increasing.

2.1.1 What is a Project?

An activity which we call a project has some basic characteristics which are shown in figure 2.1. The project is represented abstractly as an oblong.

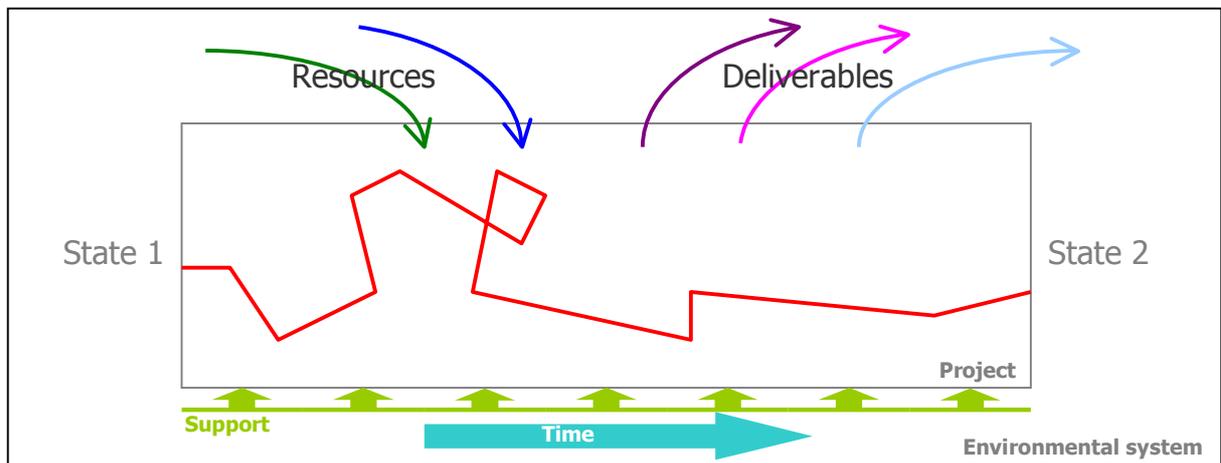


Figure 2.1: Project Model

We put resources in and get deliverables out. The whole process takes time and needs support, taking the environmental system from a former state to a different state after the end of the project. Everything which

¹ Information Technology

crosses the project rectangle represents a communication, for which a communication mechanism is needed and the rectangle is either a barrier or an opportunity.

Almost any human activity can be represented as a project^[P22]. More abstract analysis of what a project is^{[P23][P24]} includes characteristics such as *Cost*, *Scope*, *Time* and *Quality*. Communication could be described as a facilitator of quality, with an associated cost investment but, the analysis itself requires communication, a very human aspect of projects.

2.1.1.1 Example: Adapting the Communication of Time

Even tracking the effect of timeline on the progress of the project needs a communication mechanism. As an everyday example, most mornings there is a short project which runs, called "getting ready for work and school". The time-tracking communication is provided by all of the clocks in the kitchen and bathroom. The particular context of getting ready in the morning is that of being "half-asleep". To keep this project safely on track, all the clocks are adjusted five-minutes ahead of local time and this is called "Kitchen TimeZone", or KTZ. Adjusting the project timezone in this way enables the objective of being at school and at work on time to be attained. The project management tool has been successfully adapted to the specific user needs!

2.1.2 Basic Project Management Tools

Many tools exist which address certain aspects of project management (PM). For instance, the audit of the project context may involve forms^[P21] of a particular kind, such as questionnaires. Many PM tools address the tracking of events and task progress, such as Gantt^[P34] and PERT^[P35] charts. Resource planning and tracking tools can be quite complex^{[P37][P36]}. Some very unergonomic tools exist for monitoring projects with 100,000s of tasks. They will not be referenced here because even the slides which describe the tools are not ergonomic and crammed with detail, as though the presenter were paid by number of words.

Communication is often identified as a key element in project management^[P28]. Since the project is performed by people, the need for such monitoring tools is more a human communication need than an abstract object tracking need. This makes the choice of tool less important than the way it is used. The tools are merely a communication medium to help decision making.

Key PM tools are available as computer applications. As Jon Collins points out, Microsoft may have a poor reputation in certain areas but they do understand how people work together: "While the enterprise software vendors [...] treat project management as a problem to be solved on an enterprise scale, Microsoft will be solving it on a human scale."^[P16]

The success of a project depends on the people^[P17] and how good the communication is between them. Projects are human constructs and their communication requirements are an image of the people behind the projects^[P29].

"The PM tools are merely an aid to decision making. Nothing replaces the intelligence of the Project Manager"^[P15]. "You cannot replace a good project manager by a good project management tool. [...] Project management quality comes down to the quality of the project manager"^[P16].

2.1.3 Evolving with Project Management

In IT, the current trend is for the big projects of the previous century to be broken into manageable units of smaller projects which are decorrelated so as to reduce risk and ease the coordination between multiple diverse teams. There are no more "big bangs" and project-based change has become a constant^[P17] element of the business and cultural environment. The smaller projects are linked as programs^[P18] placing them in the foundation of the guiding strategy, be it national or corporate.

Many texts do not mention the people behind the projects. They refer to "total project life-cycle", "asset management", resources and assets being

“consumed” by projects, in a very abstract sense^[P20]. This may be because in the big projects of the past, the individual was isolated from the *communication interface* (figure 2.2). In the networks or *programs* made up of smaller projects, more individuals are exposed directly to the communication interface (figure 2.3).

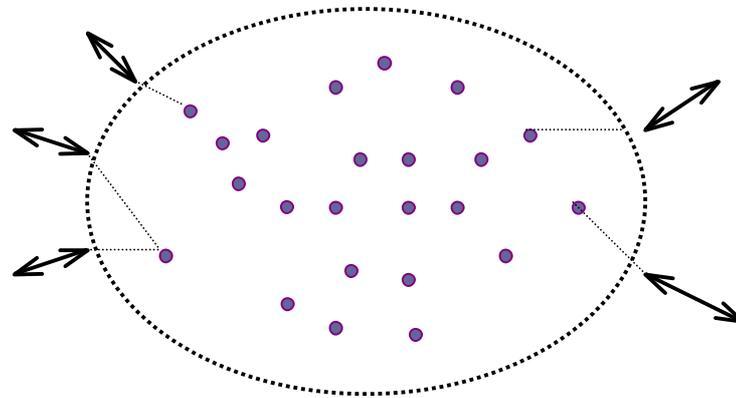


Figure 2.2: Big Project with Participants far from the Communication Interface

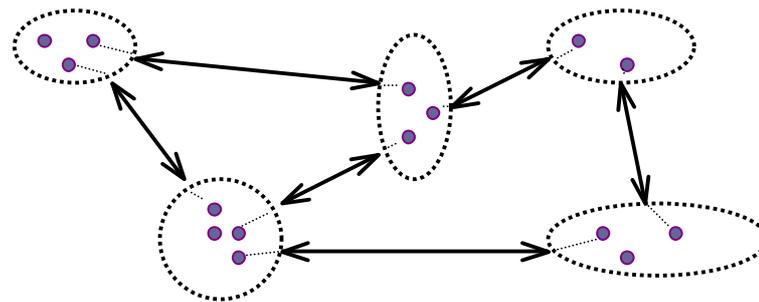


Figure 2.3: Network of Smaller Projects with many Communication Interlinks

Organisations are happiest implementing change as a sequence of projects^{[P17][P5]}. These multiple smaller projects share resources in the same *environmental system*, making the project a popular tool for managing change. Strategic operational and development management is broken into concise, manageable units. The project is a more **ergonomic**^[I32] management tool than the former non-project oriented management method and, projects networked as a program provide a more ergonomic communication environment, facilitating consolidation and collaboration.

To help aligning business requirements with IT deployment, portfolios of IT projects are managed at a strategic level. Project Portfolio Management

(PPM) is the new name invented for this strategic program management, which aims at validating and prioritising projects within the portfolio according to their business pertinence at a particular time. The fact that such methods are needed shows that some serious mis-alignment must have occurred in the past, probably due to poor communication between financial decision makers and project teams. Indeed, only 25% of enterprise projects reach their expected results^[P19].

Implementing PPM is a more transverse process and new tools need to be developed by the major players, such as Microsoft and IBM. The communication content of these tools is increased compared with the project-only tools. Whilst many isolated project management tools such as Microsoft® Project and even Excel, in many cases, are used for little more than planning purposes, such as creating Gantt² charts, these charts need to be shared manually. For instance, to support director-level decision-making, corporate financial strategy needs to be worked into the program manually. A global vision of a number of different projects needs to be prepared manually. These collaborative aspects are missing from today's project management tools.

2.1.4 The Key Role of Communication

Participants in projects today spend less energy on the project as a means of expression or of asserting their skills and concentrate more on the factors which limit the performance of projects^[P7]. Given the power of communication to facilitate the management of risk and of unexpected events throughout the life-cycle of a project, poor communication can be a severely limiting factor to the performance of a project.

Communication plays a significant role in every aspect of the management of a project, including the following non-exhaustive list:

- Control, monitoring and supervision;
- Negotiation (client, supplier, team participation, ...);
- Reporting (creating reference documents, explaining progress, ...);

- Defining responsibilities (governance, legal framework, ...);
- Analysing risk (task by task, resource by resource, ...);

Communicating information effectively is almost as important as the information itself^[P33]. The ability to master the semantics of interaction at the right time and with the appropriate tools, formally or informally, is key for project success^[C41]. This paper explores how to adapt the communication aspect of tools to create durable links between humans and thus support the lasting project management so important in projects running over a number of months or years.

Given the importance of the human factor, it seems obvious that PM tools need to be adapted to the team and project requirements. However, this way of talking about the project often gives way to the unfortunate approach of adapting the team and project to the tools, simply because satisfactory tools are not available, are incorrectly audited or adapted, are not adaptable or, are outside of the budget range available for the project^[P8].

Communication technology has a mediation role between the teams of participants on a project. Enabling the added value of communication concerns the management of the relationship between the human and the tool by *adapting the tool* to the needs of the user. However, rather than talking only about the Human Machine Interface^[C50], it is more relevant to analyse the role of technology as an interface in human to human communication^[I18] and the methodology behind the choice of a particular tool for a particular project management task.

A successful technological tool must be socially acceptable and must allow a significant degree of control by the user^[I22]. Poorly designed, inappropriate or incorrectly used technology can harm the communication link between people.

² **Henry Laurence Gantt** (1861-1919) developed this technique in the 1920s to show progress on projects.

2.1.4.1 Communication Tools in PM

The project manager uses many different basic communication tools to turn the key which unlocks project efficiency:

- technology, such as telephone, email, IM³ and web site publication,
- face-to-face meetings,
- visual presentation tools (slides, Gantt charts, relational team structure charts, project organisation charts, ...),
- written reports such as meeting minutes and action tracking.

Getting the ergonomics right and the tool adapted correctly to the user requirements is simply the art of helping and *letting* the user specify their own requirements^[P10]. It may also be important to know when *not* to deploy a particular communication tool, so as to encourage the project participants to express themselves.

For projects whose teams are spread out geographically, communications technology can be of significant value by reducing the need for travel and facilitating information sharing for distributed teams. Collaborative tools can have a significant impact on team performance even in the same building^[I17]. Tools need to be carefully evaluated to ensure performance improvements correspond with tool investments⁴.

2.1.4.2 Example: Adapting Terms

When computers appeared, so did the term **IT** and, when computers started talking to each other, the term became **ICT**^[I1]. The term refers specifically to technological means of communication and *misses* the human factor. To begin adapting the PM tools to focus on the human user's needs, a better term is **ITC**^[I3] for **Information Technology and Communication**. This small change in word order now refers not only to communication as a *technology* but, more generally, to *any* kind of communication, such as the communication of *meaning*. That is, not between machines but between *people*.

³ Instant Messaging, see section 3.1.3 : "Tools for Overcoming Distance".

⁴ See section 2.4.1 for decision aids on evaluating tools.

2.2 *The Human in the Communication*

The team is a tool^[P15]. The real source of power on a project is the individual^[P25]. The team is linked by human communication. This becomes particularly significant in international projects or situations of inter-team conflict.

The ergonomic improvements in project communication need to be centered around tracking every detail of the exchanges between people. People are the *receptors* who perceive what is most important and relevant to the success of the project. They do this naturally because they are most interested in what is important to them and what touches their work and effort directly. They prioritise information on what is important to their work.

The project participants provide information on the health of a project which is more accurate than any measurement which does not take their opinions into account. Many references cover project management with an abstract tone, separating their analysis from the human player and never mentioning the communication “life blood” of the project^[C29]. If they do mention it, they offer training for the *mechanical* aspects of PM but go around the communication aspects without touching them.

2.2.1 **What is Communication?**

Like behaviour, communication has no negation since non-communication also communicates a message^[C48]. Communication is irreversible^[C49] since a signal cannot be taken back. The past hundred years has seen an extraordinary amount of work on language and communication^[C23], fed by the need for computer languages and computer communication models.

Most traditional research on the process of communication^{[C47][C45]} is based on a model involving a **sender**, a **message** in a **channel** and a **receiver**^{[C19][C21]} (figure 2.4). This model works well between computers but may actually be misleading in the study of human communication^[C20]. Communication consists of understanding the listener^[C42]. Certain models

touch on the need for a shared reference environment (culture, values, world events, etc.)^[C22] whilst other models include the reaction with feedback message^[C24].



Figure 2.4: Traditional Communication Model

These models give only a limited view of the whole system such as the *human* network of participants in a project activity who exchange *meaning* and not just message containers. The shaded areas of figure 2.4 show the interface which is critical to sharing meaning over the *link* between the people. The quality of these interfaces depends on the understanding of the individuals and their confidence in the *contact* with the other person⁵.

Communication between humans has the noble function of creating a network: to function correctly, participants on a project literally *bathe* in human communication. This is because after transmission *both* parties are aware of the contents, of its presentation format, even the “who else knows” characteristics. Each information transfer can be analysed for its content, its format, etc. but also for the strength that it brings to the link between the source and destination of the transfer.

Another feature of message transfer which is considered in many models is the effect of *noise* by reducing the reliability of the transfer of the message and its meaning^[C37]. Noise is overcome by using many parallel channels to transfer the message. For instance, in a conversation between two people in a room, not only is the sound signal transferred between them but also the image and sound of their bodily movements^{[C25][C26]}. Qualitative analysis suggests that the meaning content is, in fact, much more significant in the non-verbal channels than in the verbal and textual channels^[C27], although there is some disagreement over quantitative figures^[C28].

⁵ This model is developed further in section 2.3.3 .

Further, *hidden* channels also include shared environmental meaning from their culture and spatial information such as where a person decides to position themselves in the room^{[C9][C13]}. The exact way in which these channels are blended to construct an understanding of the meaning of the message is not known but the process does depend upon shared knowledge, also called *common ground*^[C35]. When managing virtual project teams, many of these channels are not available. The common ground of information objects, or *referentials*, are of great importance for effective project management.

2.2.2 Common Neurological Configurations in Team Management

Neurological influences on human behaviour can be taken into account to optimise information output and presentation. Their significance is affected by environmental conditions and culture, such as whether one writes from right-to-left or left-to-right. They include the following:

- adapting information language to appeal to all possible personality types amongst the participant population (visual, auditive, kinetic);
- adapting information visual layout to reflect emotion-guided eye movement (looking down and to the left when referring to past experience and looking up and to the right when referring to future events)^[C1].

At a philosophical level, the human is not an object but the subject of a project^[P6]. Project optimisation occurs *via* the human participants. At a very physical level, the neurological aspects of human interaction must be taken into account to avoid confusion between person and object. Two people may be working on resolving a problem and be in a face-to-face physical configuration. This is a confrontational configuration which can rapidly lead to confusion between the *person* opposite and the *abstract* problem.

To avoid the conflict posture, a ternary configuration must be adopted physically, with both people *side-by-side* and facing the problem together^[C2] (see figure 2.5). If the problem is a broken machine, this

stance is natural. If the problem is more abstract, a device can be used to create this physical configuration of *cooperation*, such as a paperboard or a computer screen.



Figure 2.5: Ternary Configuration for Problem Analysis

If the physical presence channel is not available, such as in a telephone conversation or a video presentation, then shared *referentials* can be used as safe meaning containers. People can be encouraged to analyse *objectively* by an abstraction of the object and its dissociation from their being.

2.2.2.1 Examples: Abstract Ternary Configurations

The ternary configuration allows very difficult issues to be presented and analysed effectively, as with Jaubert's film documentary technique of commentating concentration camp photos with the voice off camera^[C17]: the viewer is placed *psychologically* side-by-side with the commentator, both, therefore, facing the shared problem together.

Another example is meeting seating arrangements. For virtual meetings, the verbal and paraverbal^[C7] channels become predominant. To create the ternary configuration, a psychological replacement of physical positioning needs to be found. When project participants are linked by a computer network, various document-sharing tools exist which can be used to this effect by drawing focus to the computer screen. Ergonomically, this creates the effect of being side-by-side in front of a big, shared screen.

2.2.2.2 Example: Cultural Influence

France has one of the more oral cultures of Europe. Conversation participants, "sharing oration" about the *object* of their conversation, usually do this in a face-to-face configuration, which creates an alignment

of the transmitter and receiver. Unfortunately, this is also a binary configuration which corresponds to the neuropsychological configuration of *conflict*.

The Anglosaxon tradition is rather more pragmatic with a strong tendency of using images and mental notes during conversation, the further analysis of which leads to a ternary configuration. Both conversation participants are then psychologically side-by-side and turned towards the new reference *object* of their conversation, in a neuropsychological configuration of *cooperation*.

2.2.3 The Project Management Communication System

Perhaps part of the need to manage change as small projects is the need for communication with a world larger than ourselves. That is, the project itself serves as a communication tool through which participants can explore and discover who they are^[C40].

Between two participants exchanging meaning, two languages may be used: the language of reason and the language of imagery^[C51]. To increase the probability of successful communication, the message sender needs to understand how the receiver is likely to interpret the meaning of the message^[P30]. As participants get to know each other, they will know intuitively better and better how a particular partner needs to receive their information^[C31]. Overlapping experience ensures multiple supplementary reference channels, also improving communication. This is why *team-building*^[C53] is so successful. It is also why the best way to learn a foreign language is by living in the country in what is known as *total immersion*.

2.2.3.1 The Project Management Platform

The project management platform contains the entire base of information shared amongst participants and between them and the project environment (see figure 2.6). It must be sufficiently *flexible* to accept new, unplanned types and formats for communication, thus allowing the team to *learn* how to optimise all of its communications^[P2]. It also supports all of the tools used for managing the project.

The input of information to this platform is critical to the quality of the contents of the platform. A major task for the project manager is to work with the participants to identify appropriate referential formats for information input and output, contact frequency^[P31] and assigning responsibility for associated action.



Figure 2.6: Project Management Platform

Further responsibilities of the project manager include promoting open communication between participants by all means, to ensure the ergonomic feedback processes essential for rapidly identifying and processing project risks^[P39]. Feedback to and from the project manager should be developed to ensure complete communication cycles^{[P32][P33]} as well as team learning^[P38]. Participation is promoted by recognition, such as responding to communication from participants quickly and, processing all requests and events brought about by participants, thanking them, etc.

To optimise the input, the project manager needs to:

- ensure as many channels as possible are used, which means sharing a maximum of complementary common referentials (written reports, planning views, identification of critical issues) in parallel with face-to-face and teleconference meetings;
- multiply to a maximum possible the number of channels assigned to each vector of communication, including channels identified in figure 2.7.

To the communication channels identified in figure 2.7 can be added that of *silence*^[C6]. This powerful channel works both on input and on output and the project manager has an important role in animating this channel, especially in meetings! It takes us two years to learn to speak but a whole lifetime to learn to be silent^[C8]. Another channel which the project

manager needs to be aware of and control, is *rumour*. Belief is a powerful tool but also one which can harm if used unjustly^[C4].

Two channels have been left out of the table: fax and written letter. These older channels are not practical for the speedy communication needed for virtual diverse team project management today. New written-oral communication based on short text exchanges, called *parlécrit* by Cécile Moulard^[I9], is used instead. It represents an evolution of both oral and written language, the latter becoming *live writing* and evolving like a spoken language.

Information Input	Information Output
face-to-face conversation face-to-face meeting e-mail telephone teleconference video conference dynamic computer screen sharing ...	animated presentation slides written electronic reports Gantt charts action tracking tables web site pages ...

Figure 2.7: Some Project Platform Communication Channels

For reporting and overall strategic control, project portfolio management is a way of increasing the number of channels in and out of the PM platform to improve communication between deciders, experts, providers, users, customers, etc.

2.2.3.2 Optimising Input

Gleaning the information from participants means adapting the listening input channels to their means of expression. Self-censorship must be discouraged. Conflict is very easily avoided by imagining, with every new communication, that it is the first ever communication with that participant or partner. Any antagonism from a possible previous stressful communication has no logical place with this approach.

When measuring performance, people are very sensitive to events and conditions which affect:

- the effort they must provide and,
- the way their work is perceived.

These are essential levers for optimising the information they provide as input into the PM communication platform. Their work is an act of self-expression, which is something humans enjoy very much, from the earliest age. The project manager can obtain great depth to the information on input to the PM Communication System.

2.2.3.3 Communication and Information Management

The project manager has the role of consolidating, in a synthetic way, this movement of extremely relevant project information. The ergonomics is of utmost pertinence in the ways in which this information is stored, for future reference and presented to the extended project team. This communication management is directly linked with this ability to obtain synthetic conclusions from multiple diverse inputs.

The diversity can go as far as multicultural and geographical dispersion for international projects. People are the key. The project manager must use communication in various media to extract this information from the project participants: communication channels, message delivery tracking, distribution mechanisms, shortening vital information paths, etc.^[C39]

What metrics can be used for measuring the efficiency of storing and presenting this information? They include:

- participant praise for tracking fine detail Action Items,
- praise for clarity of web site presentation,
- short and concise meetings,
- short, concise and synthetic written reports.

Management *is* Communication, creating bridges between team participants^[C5]. Communication is the essence of our being and care must be taken to avoid confusing the actions or the property of an individual with their communication, or their being^[C3].

2.3 A Model for Project Management Interaction

This section develops a simple model approach for successful project coordination.

2.3.1 The Importance of Contact before Communication

Communication is a collective activity of the first order. It takes two people to acknowledge each other, to shake hands, to tango, to make love^[C36]. A link exists between these individuals and they form a cooperative *ensemble*. To establish this *contact*, all of the barriers to communication have been lifted.

Contact is the state of the relationship between two beings or two objects. There can be no communication transferred – or in the physical sense, no signal shared – without contact. This is an axiomatic concept.

Connecting participants is about creating a favourable link between their internal nature, with its beliefs and values, and the project environment of partnerships, tools, strategic direction, constraints, hopes, ambitions, etc. It is estimated that some 85% of personal financial success comes not from skills and knowledge but from the ability to connect with people^[C30], creating a contact of *trust* and *respect*.

The concept of contact will be used to formalise the *link* between communicating parties. It has been noted in section 2.2.1 that noise in the communication can be overcome by increasing the number of multiple channels. A noisy link hinders efficient communication and examples of such links are telephone conversations and electronic text messages, both of which lack a number of the non-verbal and paraverbal^[C7] channels taken for granted in face-to-face communication.

more channels → more efficient link → better contact

By analogy, the effectiveness of a communication tool also depends on the link with its user. The study of the ergonomics of Human Machine Interfaces^[118] recognises the importance of the human factor in the quality of this contact. Of course, the user is not really interested in dialoguing with a machine and the tool is just an instrument for communicating with another project participant or partner.

Many links go to making up the overall link which transfers meaning from user to user⁶. Here the term "communication tool" refers not only to synchronous communication but also to asynchronous exchanges, such as meeting minutes and project progress reports.

2.3.2 Coordination is Lost Without Communication

If the contact is not strong enough, the link is ineffective and communication difficult. Experience has shown⁷ that ineffective links ultimately have a negative effect on project coordination, with all of the problematic impact that can have on project timeframes:

poor contact → difficult communication → coordination goes off track

Optimising project communication is impossible until it is functioning well enough to satisfy coordination requirements.

2.3.2.1 Example: Strengthening Contact Facilitates Mediation

In a conflictual inter-team relationship, project communication seems to be going around in circles until contact is strengthened between the two teams, thereby facilitating mediation to resolve the issue.

To strengthen the contact, a new channel is created, concerning two key participants who realise they need to communicate directly with each other instead of passing through an existing third party channel.

⁶ See also figure 4.12.

⁷ Mission experience, section 4.1.5 : "Geographically Distributed Project Coordination".

2.3.2.2 Example: Key Contact Facilitates Coordination

The corporate network team in an international company has received a number of isolated requests for improving inter-lab connectivity for the research and development departments in various countries. However, despite numerous interviews with the individual requestors, the corporate network project manager is unable to understand the overall project.

The question is resolved by the identification of one correspondent who agrees to act as SPOC (Single Point Of Contact) for all of the lab requests. Within two weeks, the SPOC has taken on a project manager role within the lab department and has identified four different requirements. The new channel enabled by the SPOC improves communication and leads to more efficient coordination of the lab network design and deployment, thus saving cost by mutualising infrastructure.

2.3.2.3 Example: When Contact Fails, Coordination Ails

Unannounced and unplanned changes in key project participant roles, once a project has started, can have a very negative effect on coordination. In this example, communication has been set up over a period of two months, enabling the project coordination tasks of governance and planning. A meeting and reporting schedule has also been created.

The supplier changes two key people just prior to their first milestones. One of the new participants questions the logic of the meeting and reporting schedule while the other has difficulty coming up to speed on their key activity, no doubt because of contact with the project which was too weak. Both new participants were “dropped” into the project by the supplier directorate and the overall project manager has insufficient contact with them to communicate effectively on the coordination of the project. The contact cannot be improved because initial face-to-face meetings have already occurred on the project and budget is insufficient for supplementary travel.

Team changes must be accompanied by a *rich contact* event. In this example, if a physical meeting is not possible, the situation could be greatly improved by setting up a routine teleconference using the high-quality corporate video-conferencing facility instead of the standard poor-quality telephone bridge. The live video would strengthen contact between participants by adding *gestual, non-verbal* and *positional* channels to the meeting communication spectrum.

In fact, no video-conference was used because the supplementary channels needed for improved contact materialised as management escalations and hierarchical control. More emotions were spent but the overall result did improve communication and, hence, coordination.

2.3.3 The Three Co's for Effective Project Management

In multi-team contexts, as described in the previous two sections, efficient communication between teams is encouraged by good contact between individuals within the teams. This needs to be established at all hierarchical levels between the teams and in each field of activity within the teams.

A sign that this contact is lacking, is a so-called "politically loaded situation". Seeing the problem as political is a way of saying it is a communication problem. It is the role of the project manager to intervene, usually through apparently casual conversation with participants in each team, to identify possible missing links and promote supplementary channels.

All project meeting opportunities must be used by the project manager to promote supplementary channels between as many participants as possible, by:

- using all of the human interaction methods identified in previous sections and,
- ensuring language appeals to all personality types (visual, auditive, kinetic, etc.) whilst,
- remaining sensitive to postural and neurological channels.

One-on-one meeting opportunities, even if only by telephone, are essential with *all* participants to establish fundamental coordination communication. Much of this can be accomplished during a thorough pre-project or early-project *audit process*.

A project management methodology can include the following features:

1. A process of interviews to determine project participant needs;
2. A study of current inter-team communication performance;
3. An information sharing platform (email, web, etc.);
4. A platform for remote synchronous interaction (instant messenger, audio and/or video bridge, etc.);
5. A governance policy (roles and responsibilities, meeting schedule, time discipline, etc.).

Whatever the methodology, the underlying mechanisms which go to making up the quality of the interaction between humans or between a human and a project communication tool must be borne in mind. This interaction process is provided here as a convenient mnemonic:

interaction: contact → communication → coordination = *in3co*[®]

Here, the *3co* abbreviation is itself a supplementary channel and referential in which the idea and the importance of contact can be found. The referential is easy to keep in mind in real project management optimisation opportunities. It is an easy concept which has been used with some success in the missions described in chapter four, which involved optimising a number of project interactions.

The third “co” could also refer to *coherence*, as presented by Schmalz^[P26]. Indeed the model with coherence in the place of coordination also works well. However, as we see in this figure, we are using the model in the field of project management and the top binding layer, coordination, creates the coherence in the project context.

2.3.4 The Inverse Hanoi Human Networking Model

In the course of setting up the coordination *network* between participants in a project (delivery gates, meeting discipline, ...), standard packages of information (documents, forms, ...) are exchanged between participants. At each stage, 3co is applied.

The methodology being presented is based on creating links, with the objective of helping human-to-human links to flourish by improving the elemental links in the communication chain: human-to-tool, human-to-method, tool-to-tool, individual-to-team, team-to-team, etc.

These project coordination links are shown schematically in figure 2.8, where an intermediary technology platform is facilitating the coordination link between participants A and B. This model, called *Inverse Hanoi*, is inspired by both the Open Systems Interface^[125] model of networking and the Towers of Hanoi^[126].

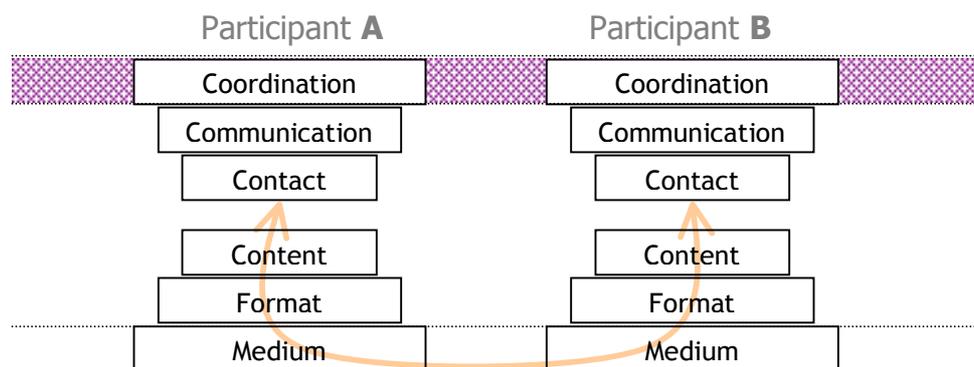


Figure 2.8: The Inverse Hanoi model for the project coordination link

The lower part of the model is a traditional representation of information transfer over a physical medium. The upper part is inverted because, although the message transfer enables the communication necessary for project coordination, the coordination takes place at the human level which also holds the responsibility for implementing the communication link over the medium in the first place.

2.3.4.1 Example: Inverse Hanoi for Meeting Minutes

Meeting minutes have a particular format and the informational message is in the content. The analysis of the previous sections shows that the meaning cannot be transferred reliably without sufficient contact. The communication set up in the exchange of meeting minutes serves the purpose of coordinating the project.

2.3.5 Technology in Support of Project Interaction

It can be a challenge, even in the optimal communication conditions of a physical meeting, to achieve agreement on all of the aspects of a project^[P14]. In a teleconference, the number of channels available for communication is reduced and this challenge is greater.

Thankfully, technology provides us with new, innovative ways of opening up supplementary channels^[I27] through a variety of communication options. These will be examined in some detail in chapter three.

For collaborative project management, current tools are either very expensive or do not cover the full spectrum of project coordination requirements^[P41]. Alternative strategies exist for small to medium-sized projects, where cost-effectiveness is critical and budgets are very tight. Web platforms, such as ProjectPlace[®], serve as more flexible FTP^[I31] servers. True Workflow solutions are rarely applied and technological implementations difficult to find.

A promising new platform on the market is IntraKnow[®], a very ergonomic, simple and reliable web-based platform currently oriented towards the management of industrial workflow processes^[P27].

And then there are big, impressive multi-consultant deployment solutions. These tools each provide a particular set of services. Often overlooked, is the fact that each project is *unique* with specific characteristics which depend largely on the experience, skills and culture^[C12] of the team of people responsible for the project.

2.4 *The Advantage of Consultancy in Project Management*

Consultants may be brought in from outside an organisation to help with a change project for a number of reasons, including:

- Original ideas and approach, based on independent experience^[P1];
- Rare or special skills, for strategic activities linked to the project;
- Externalisation of skills and management of outsourcing^[P4].

The consultant is needed as an external change agent facilitating corporate restructuring following market shifts^[P41]. Their presence helps the organisation achieve their purpose and objectives^[C32] by mediating between partners who communicate with difficulty, improving team performance. The temporary presence of the consultant does not threaten the long-term position of people whose jobs are undergoing change. The transverse communication which the consultant can enable, allows new governance to be deployed and processes to be re-engineered.

The mediation role of the consultant can be critical to the success of a change project. Conflict situations kill communication and, as a result, impare the performance of project management^[C34]. Mediation can help avoiding the lose-lose conclusion of a conflict escalation^[C38]. The intervention of a consultant who is neutral to the situation can help arranging optimal communication right from the start of a project and thereby avoid systemic conflict.

The very first project communication tool to be optimised in a consultancy situation, is the collaborative relationship, or *coproduction*, between the consultant and their client^{[P11][P12]}. This is essential for understanding the change occurring in a multi-team context. Without the client-consultant collaboration, there is no effective consulting^[C33].

2.4.1 Effective Communication for the Client

At the beginning of section 2.2 it was suggested that the most reliable source of critical information about a project's health is the participants themselves. They need to be able to express themselves and be heard. Also, communication needs to overcome noise and one of the ways to accomplish this is multiple communication channels. The independent consultant can facilitate these processes by:

- opening new, parallel *listening* channels between participants and,
- identifying new ideas for structuring information.

In the project team, the consultant can facilitate both dialogue and discussion^[C51].

When faced with a new tool, instead of wondering what it does, how it works, what one could use its features for, the question to be asked is: "What do I want this tool to do?". That is, the analysis of the tool needs to be refined to the current context and needs, then adapted to those needs or, if it cannot be adapted, simply not used. Project performance is lost if participants need to adapt their behaviour to an inappropriate tool.

To facilitate the choice of more complicated application options and collaborative tools, subjective criteria matrices^[P12] can be used. In figure 2.4, "Score" is a value assigned by the users to each of the different criteria of the tool under analysis. Of course, even this methodology tool must be adapted by careful choice of the "Criteria" labels and of the "Score" being measured (performance, importance, etc.).

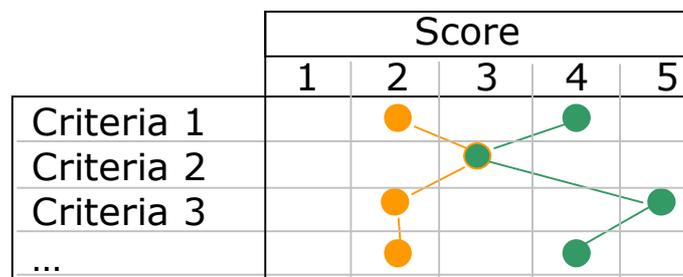


Figure 2.9: Analysing the importance of different criteria for a tool

2.4.2 Essential Feedback for the Consultant

The added value of the consultant is their independent knowledge of how projects work, collected over many separate and varied missions. The experience of a new mission will allow the consultant to improve and innovate their portfolio of products and service offer^[P3]. This feedback cycle is shown as a balancing process with a delay^[P1] in figure 2.10.

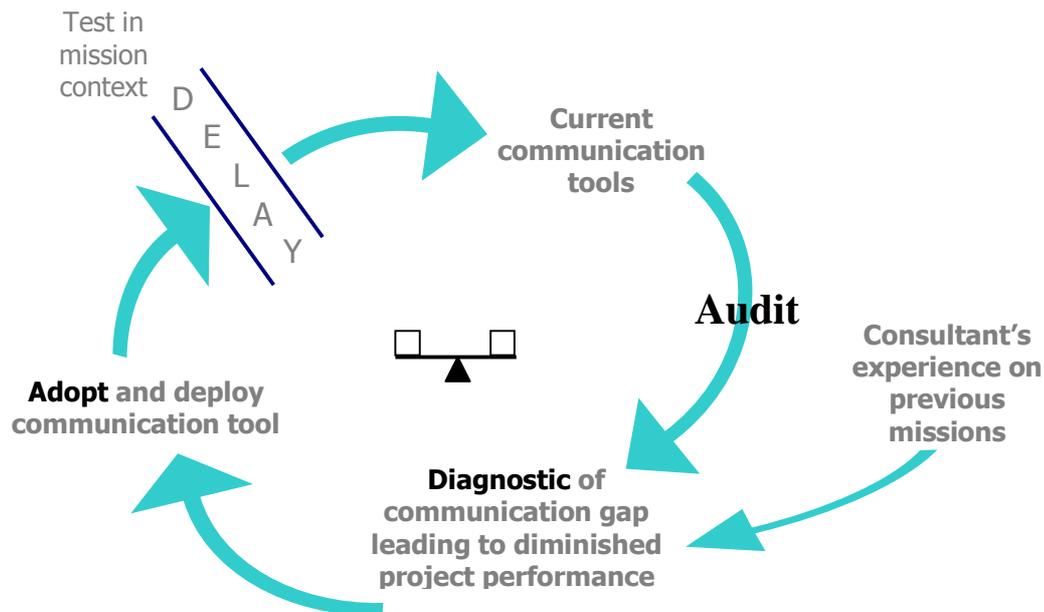


Figure 2.10: Consultancy product enrichment process

2.4.2.1 Example: Creation of Product Brochure

Product changes can be very basic. A recent market study^[P41] showed that, paradoxically, the word "international" should not be used when prospecting for international missions. This simple fact has been confirmed by recent mission experience and integrated into the publicity material used by the consultant to commercialise their services. The information on the clients' approach to the word "international" has been of crucial importance and indicated that, in conversations, presentations, on web sites, brochures, etc., care must be taken to avoid explicit reference to this word.

3 Optimising Project Management through Ergonomic Communication

Nearly 40% of managers spend a half to a full day *per week* on communications which are not valuable.^[119]

3.1 *Using Communication Technology*

Projects are made by people for people and the human is the reference of the system. A negotiation process needs to be created between the communication technology and the human user. This process may involve ergonomic adaptation of the technology or it may involve education of the user into choosing wisely which tool or transfer medium to use for a particular message^[15].

3.1.1 **Tools for Sharing Knowledge**

For static referential knowledge bases, websites or blogs^[128] can be used.

Larger, more powerful information bases are needed for scientific research projects. For European projects, collaborative scientific knowledge bases are currently being studied for consolidating the vast body of scientific knowledge^[116].

3.1.1.1 Presentation Issues

Even for a simple visual presentation of slides at a meeting, many graphical and presentational options are open to the user^[14].

It is easy to get carried away by the technical features available with a tool. An example is the popular Microsoft[®] Powerpoint slide presentation tool. Although styles can be defined, the procedure is quite complex and it can be felt to be easier to simply move objects around on the screen manually. The result may not be ergonomic at all for the viewer, especially if some slides are crammed with text as though the document were intended for paper reproduction only^[17].

3.1.1.2 Reports and Shared Documents

Forms^[P21] can be used but their use is linked with cultural communication habits. For instance, anglo-saxon grid-like organisation is great for forms but may not suit French, more hierarchically oriented style^[C11]. All forms and communication standards need to be adapted for the following characteristics: presentation, appearance, critical information, relative sizes of appearance between information fields. Culture may again play an important role, as with the relative sizes of motor vehicles between Europe and America^[C10].

Generating documentation may not be a priority for all project participants. However, once the document framework is created, it is considerably easier to have people contribute paragraphs. The document becomes a *real* object to which they contribute, thus generating the required referential.

3.1.1.3 Example: Web Site for new Technical Forum

For the launching of the web site for a European Consortium's new technical forum, the existing pre-launch web site for the forum is audited and recommendations for its improvement validated with the consortium leaders. Close coordination with the web site engineers ensures implementation in time for the forum launch.

Web site requirements are allowed to evolve during a post-launch animation period. New requirements are documented in written reports which are discussed with the forum management. Implementation of changes is negotiated with the web site engineers and optimised with respect to technical feasibility and cost.

3.1.2 The Humble Email

The fundamental and original electronic collaboration tool is email. Originally developed in the 1970s^[I33], it has now become a fundamental part of key business processes^[I2].

3.1.2.1 Example: Cultural Variety and Writing Email

With email, 60% of normal non-verbal person-to-person communication is simply removed^[C29]. This makes it easy for the receiver of the message to assimilate the being of the person sending, with the text before their eyes, putting them in a conflictual posture. To avoid being reduced to an email it is important to meet in person, or at least by phone, participants with whom one expects much interaction^[C16]. Given this communication context, courtesy becomes even more important^{[I13][C14][C15]}, representing another supplementary channel in the transfer of meaning by email.

A practical technique is to respond to email using as near as possible the same form and style as sender. This includes, trying to mirror the paragraphs, responding to successive points and even imitating introduction and closing style⁸. Across cultures, this ensures their receptiveness to your message and shows the fundamental basic respect you have for their being. This method also protects against falling into the traps of cultural differences you may be unaware of at the time of writing your email reply^[C43]. Other issues with email include how to present difficult news^[C44].

If the message seeks answers to questions, then the simpler and easier to understand the questions are, then the more appropriate the answer will be^[C46].

A fundamental channel often overlooked is the *subject* field in an email. Less ergonomic systems let the user send a message with a blank subject. It should never be blank and, it should be changed in some appropriate way if using an existing thread is being used to launch an exchange on a new subject^{[I6][I8]}.

3.1.2.2 Compatibility Problems with Email Technology

Technical compatibility problems exist across the dozens of different email platforms in use today. For instance, messages written *via* an Internet web browser interface, such as often provided by an ISP (Internet Service

⁸ Approach learned from Jim Sargeant.

Provider) may not be readable on email applications on the user's computer, such as Outlook or Netscape. There are many different text formatting options proposed by these various tools and you only need one incompatibility to occur in the processing of an email thread⁹ to have a problem reading the thread on all subsequent exchanges (see figure 3.1).

```
>> <P>OK for me. </P>
>> <P>Anne<BR><BR></P></DIV>
>> <DIV></DIV>
>> <BLOCKQUOTE style="BORDER-LEFT: #a0c6e5 2px solid; MARGIN-LEFT: 5px;
MARGIN-RIGHT: 0px; PADDING-LEFT: 5px"><FONT style="FONT-FAMILY: tahoma,sans-
serif; FONT-SIZE: 11px">
>> <HR color=#a0c6e5 SIZE=1>
>>
>> <DIV></DIV>From: <I>joe.bloggs@isp.com</I><BR>To: <I>Anne Jones
<ajones54@isp.com></I><BR>Subject: <I>Further to our conversation</I><BR>Date:
<I>Thu, 20 Apr 2006 07:52:47 +0000 (GMT)</I><BR>
```

Figure 3.1: Effects of Incompatible Email Systems on Message Content

3.1.2.3 Do You Speak English?

Cultural identity is linked with language. Since this paper is destined for a European audience, a deliberate use of British English spelling has been made as opposed to, say, American English spelling.

Choice of spelling would play a role in an email response to an American colleague. If American English were used, the sender would place themselves side-by-side with their colleague whereas, if British English were used ("optimising", instead of "optimizing"), then the sender would be setting themselves apart from their colleague, possibly even creating confusion as to their spelling abilities. Australia also has its own version of English. Singapore has its version of English, called Singlish^[C52]. On European projects a *EuroEnglish* can be observed.

If one is aware of the subtleties of the English variation of one's correspondent, then one can *adapt* to their particular variety of English sentence construction or spelling. If one is not aware, and English is chosen as the common language for sharing, then the choice is usually American English.

⁹ A thread is the history of the correspondence attached to the current message.

3.1.2.4 Email is Asynchronous

Messages sent by email may not be read for several hours or days. To send high-priority documents by email, the transmission needs to be backed up by a more synchronous announcement, such as a telephone call to the recipient or a brief IM exchange. It is pointless and against the rule of treating all project participants with dignity¹⁰, to blame someone for not having read an email if they have not been given the time to. It is the sender's responsibility to inform the recipient, by a synchronous method of communication, of the important message that has been sent^[110].

3.1.3 Tools for Overcoming Distance

Using computer-based collaborative tools such as Microsoft® NetMeeting^[129], documents can be shared in a live situation on the computer screen of every participant of the meeting. The ability to instantly focus two or three people on the contents of a file being edited is a very powerful and ergonomic communication tool.

In physical meetings, quick glances between colleagues can communicate much information in a way which is invisible to those participants who don't see the glances. In a collaborative remote meeting, such out-of-meeting real-time communication is provided by Instant Messenger (IM) applications, invented in Israel in 1996^[111]. IM services have become exponentially popular in the general social context: one third of the French and over 90% Americans already use IM services! The service is a tool for creating communities^[115]. In this respect, it can be used regularly and effectively to reinforce the links between participants on a project.

Even in the same building, IM is the new courtesy device for generating the initial signal for a conversation. A quick text by IM, such as "Are you available to talk 5' about the project", followed by the response "OK" and, only then, does the initiator pick up their telephone and call their correspondent. This method is more efficient than calling first and starting

¹⁰ Approach learned from Dave Jaques.

a conversation by asking "Are you available?", which has the effect of initiating a *conversational interruption*. For the mobile community, SMS systems allow the same degree of pre-conversational courtesy and efficiency.

3.1.3.1 Limits to Current Technology

NetMeeting is an excellent file-sharing tool but works less well for video conferencing. In fact, for best performance of the latter, a dedicated video bridge is needed. The cost of these often prohibits even experimentation. Some Internet-based IM services do provide reasonable videoconferencing¹¹ and the service is starting to appear on mobile phones although, there, the difficulty is finding correspondents with a compatible video-conferencing phone!

Significant compatibility problems exist between different IM services but multi-protocol IM systems are beginning to appear^[114]. Generally speaking, a truly integrated and open communication platform does not exist. The user must build their own bouquet of communication services^[112].

3.1.3.2 Example: A telephone conversation

The communication tool can be extremely basic and nevertheless merit adaptation to increase its performance in a given context. For example, to accomplish the adaptation of a simple telephone conversation within a team of international participants, in3co[®] may be applied as follows:

1. It is first necessary to detect the language preference of the correspondent, by establishing an initial *contact*;
2. It is then possible to negotiate a common preferred language, thus establishing improved *communication*.
3. In the context of PM, these two steps are essential before the third step of *coordination* can take place.

¹¹ Such as Yahoo and Skype.

3.2 *Applying the 3co Model to Project Guidance*

This section shows how the 3co¹² model developed in the previous sections may be applied to practical project management activities.

3.2.1 Guiding projects when they begin and as they progress

Successful projects require efficient relationship management involving a number of parameters:

- Adapting processes and tools to team architecture and needs,
- Resource-efficient meetings (both face-to-face and virtual),
- Effective internal and external communication strategies,
- Impeccable budget and timeline discipline,
- Interfaces between multiple teams, companies and locations, perhaps including international:
 - Language flexibility,
 - Cultural openness.

This *whole system* approach, which quickly identifies the aspects of a project screaming for attention, is helpful for small, local projects and becomes critical for international deployments and developments.

Traditional project management techniques, such as Gantt charts, are used to support milestone planning.

Communication methods are adapted to the project needs, ranging from email lists to more evolved intranet and audio-visual tools.

3.2.2 A Basis for Achieving Success

Based on the 3co approach, the pre-mission audit allows the consultant to make **contact** with the project environment, its teams and their tools.

¹² See section 2.3.3 : "The Three Co's for Effective Project Management".

The initial analysis results are evaluated with the client and audit reports are shared with decision makers.

New and existing processes for information sharing are used to improve **communication** which is essential for the successful coordination of the project, especially between remote teams perhaps speaking different languages.

Guided by the leadership vision of the organisation, the internal and external project team **coordination** includes:

- A clear and negotiated planning for the events of each project;
- Regular and efficient meetings;
- Systematic reports of meetings and all significant events;
- Recurring coordination events, such as teleconferences associated with material deliverables (minutes, planning updates) which bring the project to life;
- Meticulous planning tracking with frequent updates;
- Liaison meetings between all players key to the various aspects of the project (see also Expert Interface);
- Engagement of the responsibility of project partners, both internal to the client system and external, such as suppliers;
- Integration of new project partners.

Existing processes and tools are enhanced and adapted to the optimal satisfaction of their users. If necessary, new processes and tools are deployed.

3.2.3 Adapting Referentials by listening to Real Needs

Referentials¹³ are important to communication in project management not just as a practical way of storing data but, much more importantly, to align communicating parties in a ternary exchange format (see the *format* layer in figure 2.8).

¹³ See section 2.2.1 : "What is Communication?".

Writing things down in referentials helps turn everyone towards a common object, the written sentence. This takes us back to the neurological need¹⁴ of having participants side by side to avoid the configuration of conflict. For instance, the written document on the screen becomes the focus of attention, rather than the voice of the colleague on the teleconference bridge! Together, the partners face the common problem which needs to be solved or the information which needs to be validated, etc. This also qualifies the importance of the *format* layer in the Inverse Hanoi model.

For larger projects, the project manager has the role of ensuring the creation of referential devices, such as common document structures, meeting schedules, etc.¹⁵

For instance, each sub-team has their contribution to share but also their way of presenting that information. They may hesitate presenting the information, waiting for other teams to present first. In fact, all contributors need to present at the same time and the only way of ensuring this scenario is for the project manager to impose a document structure and issue it as a platform for all of the contributions.

The experts all have a piece to present but it is the entire team that presents the entirety of the information. After the First Draft version of the document is published internally within the team, the project manager arranges for the sequential updates from the various contributors.

Eventually an iterative routine is established for the completion of the referential document to everybody's agreement. This means that approval is a mere formality.

The dynamic interteam communication generated helps reaching budget targets and honouring delivery deadlines. This service is particularly useful for multi-site projects, local and European partnerships.

¹⁴ See section 2.2.2 : "Common Neurological Configurations in Team Management".

¹⁵ See section 2.2.3 : "The Project Management Communication System".

3.2.3.1 Example: Planning of a Consultancy Practice

The planning for the creation of the author's consultancy practice is shown as a sequence of work phases with milestones in figure 3.2. This chart is being used as a common referential in negotiations with partners involved in the creation of the practice.

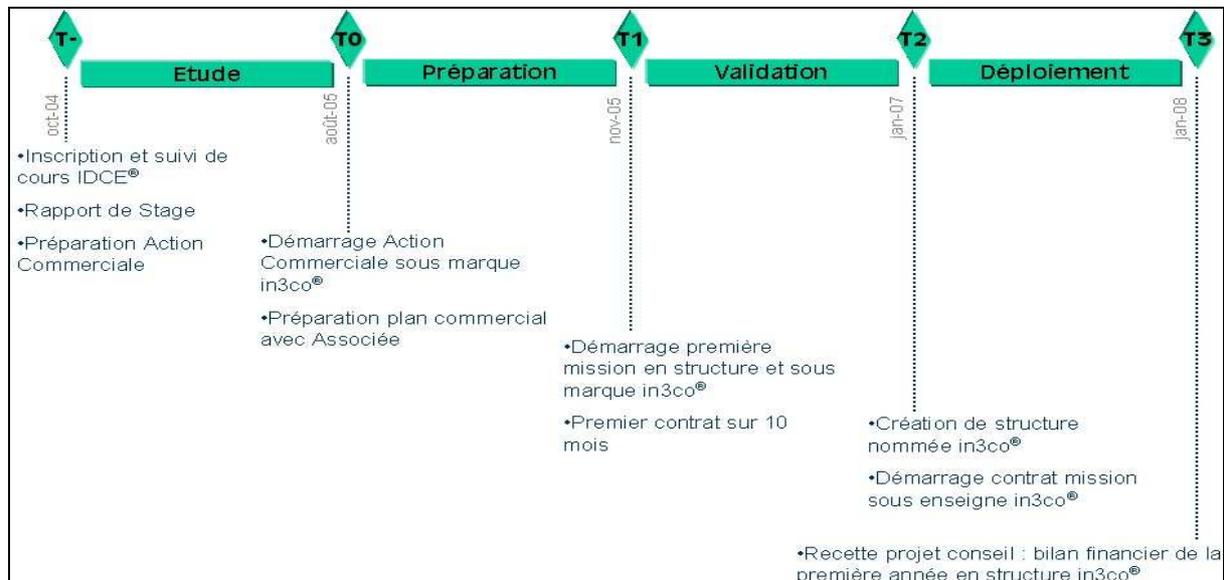


Figure 3.2: Phases and Milestones for Consultancy Practice Creation

3.3 Creating Links between Experts and Users of Technology

In helping to create a successful partnership between experts and users of technology, leadership strategies, tight delivery schedules, budget limits and other special constraints are carefully respected.

The generic partnership is shown in figure 3.3. Real-world examples include science and technology applications in the fields of medicine, intellectual property transfer and engineering, such as ITC management.

It is critical for the project manager to adopt the stance of a consultant and to remain *outside* of the client system^[C18].

Communication tools can be adapted to optimise the flow of ideas between these groups.

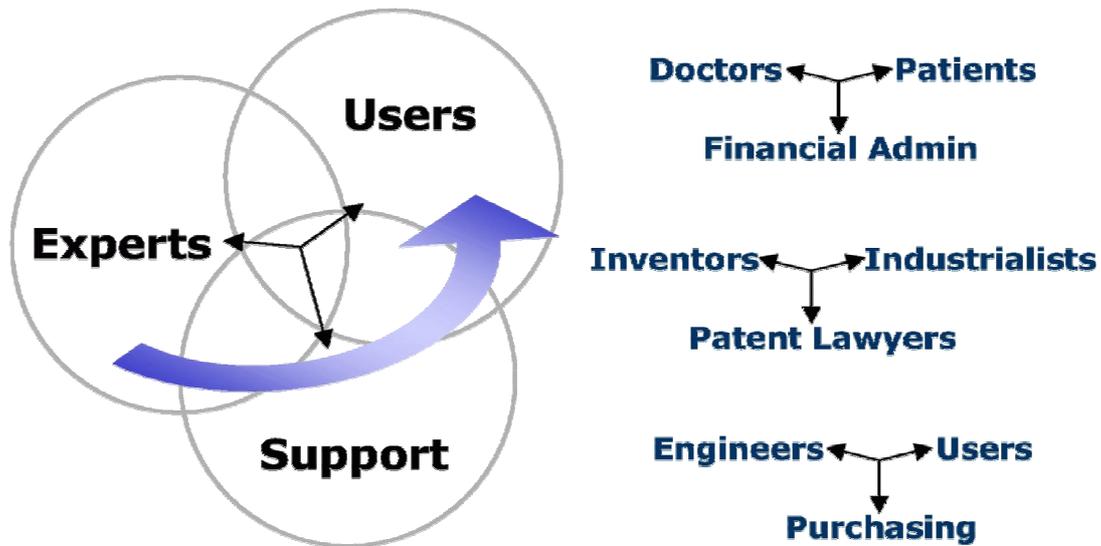


Figure 3.3: Mediation role of Project Manager Consultant

The objective is not to become an expert but rather to create an expert *interface* which facilitates the communication with the expert.

In medicine, all technologies can be used but the question is *how*? Half of all medical costs are spent on treatment during the last month of life^[120]. Maintaining coherence between medical referentials is very complex, at the human-to-human as well as the machine-to-machine level. The efficient and objective sharing of information between medical experts is critical to making the right decisions *with* the patient during this period. Ensuring patient's wishes are respected whilst optimising health care services is the subject of much new research^[121].

3.3.1 Steps to Realisation: Creating Referentials

Good *contact* with all parties is established by pre-mission audit, encouraging unhindered and open *communication*, concerning both the substance of the ideas and, the motivations and ambitions behind their successful exploitation.

The successful adherence of project participants to the project objectives depends directly on the contact which they perceive with the team and the involvement they *enjoy* in the shared experience of the project.

Rigorous planning and consistent delivery is required of all partners, through efficient and effective project *coordination*.

Support organisations need to be involved in this open communication to maximise the effectiveness of their contribution to the overall *Supply Chain*. This can include adapting the spoken language when foreign entities are involved.

Restricting the form structure to no more than four or five basic data sharing formats ensures simplicity and clarity as well as *portability* between projects. The referentials serve as *contact points* for transferring information and, thereby, communicating (following the 3co model).

3.3.1.1 Example: Adapting Action Tracking Forms

Action Item tracking on one table, facilitates the input and feedback from participants, usually as comments, as well as output in tracking meetings. Small administrative tasks and small unplanned activities go in this table.

ID	Action	Due	Status	Comment	Owner
RefNum	Objective of action.	31Mar06	On track	Updates go here. (JEY, 11Apr06). The updates always have an author and a date (JEY, 13Apr06).	JEY

- **On track:** Action Item is on course normally;
- **At Risk:** Action Item has slightly overrun the due date;
- **Jeopardy:** Action Item significantly overdue;
- **Closed:** Action Item has been completed satisfactorily complete.

Figure 3.4: Ordinary Action Item tracking table

Note, every action out of any meeting, phone conversation or other source is tracked in one or more tables structured as above and posted in a commonly available location. The effect of moving a task from "On track" to "At risk" can be positive in a teleconf with six to ten participants. A weekly teleconference, going through the table together, makes this a team event and stimulates responsibility. Throughout the meeting, it is the role of the project manager animating the teleconference to ensure dignity is maintained for all participants.

In line with the neurological principles mentioned in section 2.2.2 , static and historical information is tracked in the left-hand column whilst dynamic updates on future events are placed in the *comment* column on the right.

The *ID* is a unique, project-wide reference to the task or action entry.

The same basic table is adapted for project planning tracking, in parallel with a Gantt chart. The table format facilitates direct input and feedback from participants whilst the chart serves for reporting and synthetic information sharing. (Note that maintaining these two formats is manual, since no satisfactory integrated platform has been found for the project).

ID	Action	Due	Due	Status	Comment	Owner
RefNum	Purpose of task, with technical details, if necessary.	31Mar06	31Mar06	On track	Updates go here. (JEY, 11Apr06). Any information, from why a task is late, to technical notes, or percentage progress can be added here. The format is very flexible. (JEY, 13Apr06).	JEY

Figure 3.5: Project Planning tracking table

Also, the status implications are more severe:

- **At Risk:** Action Item is approaching due date but has not significantly advanced;
- **Jeopardy:** Action *is* overdue and is putting the whole project in jeopardy.

Fundamental benefits of this approach include efficient use of resources, both human and technological. This helps to keep costs down and projects on track.

4 Mission Experience: Ergonomic Project Management in the Field

The case studies in this chapter are taken from two of the author's recent consultancy missions¹⁶. In each mission, existing project communication and management tools were audited and then adapted to user requirements. The adaptations implemented to improve team performance were always simple.

- A **key value** throughout the missions was the respect of communication processes already in place.

The effectiveness of a tool depended less on its characteristics than on the way it was used, especially if the tool was not integrated with other tools.

- A **key observation** was the lack of true integration across the project tools and teams.

4.1 *European Project Management*

European projects with an academic orientation often seem to be identified by the direct partners as a source of low-risk revenue since there is little supervision pressure at the beginning of the projects. However, there is a moment (after 12 to 18 months for a 3-year project) when the pressure of ever more precise supervision suddenly increases, especially for the "Project Leader" partner with the project management responsibility. In terms of time spent and technical skills required, the partner investments become more tangible at this time.

As a result, unpredictable workloads make the invitations from the front-line partners for expert advice and Project Management assistance difficult to manage for second-level consultancy firms, such as the one the author worked with on this mission.

The small firm, based in Rennes, France, was asked for support in the project management of an ITC Research and Development project of the

¹⁶ Names and organisations have been changed or masked

6th Framework Programme of the European Commission. The author's assistance was requested to help keep the coordination of the multi-partner integration phase of the consortium's wireless telecom development on schedule.

4.1.1 Context of Convergence in Telecoms

There is a real need for convergence between organisations which are historically focused on the developments of **voice telecommunications networks** and those who are concentrated on the developments of **informatics data networks**.

This convergence is in progress at the technological level since the 1990s, for reasons of economies of scale and the need for interoperability between different provider networks. For example, the first telephone link over the Internet appeared in 1995^[123].

Nevertheless, the teams which design and develop in these domains have their roots either on the voice side (the major operators and telecom equipment manufacturers) or on the data side (the computer and local area network manufacturers).

A decade since the start of the telecoms technology revolution, the human part of the revolution and only just beginning. The development teams in the great international laboratories, the financial and administrative activities associated with the supply of services, are the new fields of convergence^[124].

4.1.2 Methodology Implemented for the Mission

The methodology used throughout this mission is based on the principle of first making *contact* with the people and the tools concerned. Establishing good contact facilitates *communication*, thereby improving the quality of the audit and study of the issues involved. Consultancy recommendations are better adapted because the expression of the requirements comes directly from the user. This is the in3co[®] methodology described earlier.

This methodology was even included in the service proposal prior to mission acceptance: "For the coordination of complex projects between a number of industrial and academic partners, good communication is fundamental to the successful development of ideas and of the project in general"^[P9].

A number of information sharing procedures were audited during this mission^[P10]. The analysis and observation of the way an existing tool was used was complemented by the description of the tool obtained through informal questioning of its users. The following sections describe some of the adaptations to communication tools implemented during the mission.

4.1.3 Action Tracking Improvements for Meeting Reports

Of all of the tools used in Project Management, the meeting report is the fundamental one which, if well structured, combines a number of qualities:

- A referential platform for exchanging information,
- A mechanism for synchronisation between participants,
- A way of rendering individuals aware of their responsibilities and,
- All of the above with a precise time and place attached.

These qualities are even more significant in complex projects, with diverse teams dispersed geographically. On such a project, the author was asked how the meeting minutes could be optimised. A dozen meetings were generating fifty-page reports with a complete long history of Action Items collected in the last 15 pages. Figure 4.1 shows the presentation of this list, with one table per previous meeting. The column headings are shown in detail in figure 4.2.

An important requirement for this complex project was unambiguous communication between the project partners, with the objective of defining realistic and efficient planning scenarii. The report needed to be restructured to facilitate understanding and simplify maintenance.

AP ref.	W P	Action	Who	When
6.1.3	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.4	1	Prepare the minutes of the meeting...	AP/CL	30.10.04
6.1.5	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.6	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.7	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.8	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.9	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.10	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.11	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.12	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.13	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.14	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.15	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.16	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.17	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.18	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.19	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.20	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.21	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.22	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.23	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.24	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.25	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.26	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.27	1	Update the minutes of the meeting...	AP/CL	30.10.04
6.1.28	1	Review the minutes of the meeting...	AP/CL	30.10.04
6.1.29	1	Check the minutes of the meeting...	AP/CL	30.10.04
6.1.30	1	Update the minutes of the meeting...	AP/CL	30.10.04

Figure 4.1: Example of Meeting Minutes Report

AP ref.	W P	Action	Who	When
---------	-----	--------	-----	------

Figure 4.2: Column Headings for Action Item Tracking

4.1.3.1 General Structure

The proposed changes were not major. For instance, immediately obvious was the lack of two columns: task *priority* and *owner*.

- Task priority can be presented as a standard code, succinct and easy to understand. However, the notion of priority makes more sense for planning tasks than for the spontaneous Action Items of meeting reports, whose priority is also indicated by "Due Date".

The strict chronological presentation of the Action Items from previous meetings was spread incoherently over multiple pages. Personal identification with the development of the actions was inhibited by a lack of ergonomics, or, reduced *contact* between the participants and their actions.

- All of the Action Items from different meetings were brought together in a single table, bringing coherency and the possibility of sorting.

4.1.3.2 Status of Action Progress

One single very wide free text column identified an action and also its progress. Closed actions remained in the table and interfered with the ergonomic perception of the “active” tasks.

- Information on the progress of an action needed to be separated from its description. In this example, a “Comments” column was suggested, as was the addition of a column with a standard code for action status.

4.1.3.3 Making the Individual Responsible

The complex reporting mechanisms used by each consortium of the two main projects of this mission, diluted considerably the personal responsibility of participating individuals.

- A notion of personal responsibility was introduced simply by the identification of physical participants instead of their organisations.

4.1.3.4 Simplifying Tracking as an Excel Table

Of the two proposed adaptations, the client preferred the version using Microsoft® Excel. Figure 4.3 shows the first tab of the spreadsheet file with instructions on how to use the file, the reference identifiers of meetings whose actions were being tracked, as well as some tricks for modifying the tables. The file was attached to the last page of the minutes, an ergonomic reference mechanism which maintained coherency with the report (see figure 4.4).

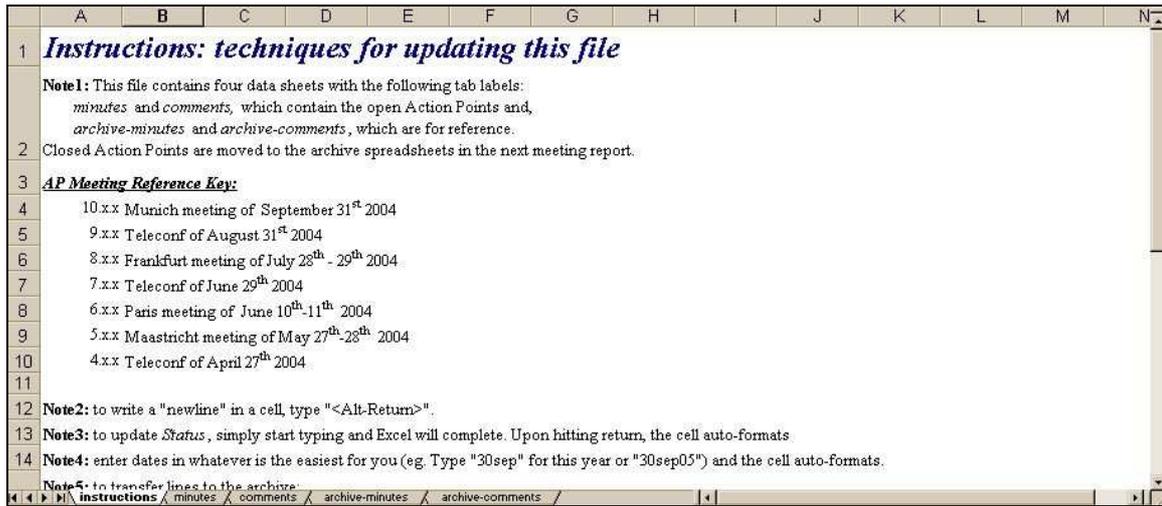


Figure 4.3: Instructions on Use Integrated in the File

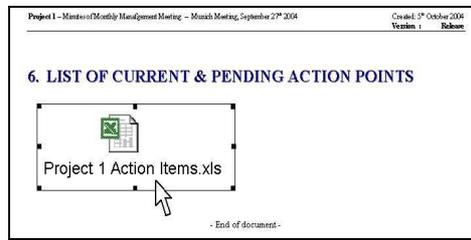


Figure 4.4: The Entire Table is Integrated as an Icon in the Meeting Minutes

The main format additions are summarised in figure 4.5:

- "Leader": physical person responsible for the action, their organisation being mentioned in the "Team" column;
- "Was For": initial Due Date which, taken together with the new Due Date "For" indicates the slide in the action delivery;
- "Status": the state of the action as perceived by the Project Manager.

AP ref	WP	Action Summary	...click for details ↓	Leader	Team	Was for	For	Status
								Critical
								Closed
								On track
								At risk

Figure 4.5: Action Item Tracking Columns

Sometimes extensive additional comments were placed on a separate page in the file and accessed by hypertext links ("A" in pink in figures 4.6 and 4.7). Closed actions were moved to separate corresponding "archive" pages.

AP ref	Action Summary	Leader	Team	Was for	For	Status
7.3.1	Summary of action	Person 1	Org1, Org2	20-Aug-04	30-Sep-04	At risk
6.7.9	Summary of action	Person 2	Org2	5-Jul-04	1-Oct-04	On track
6.7.8	Summary of action	Person 3	Org1	23-Jun-04	1-Sep-04	At risk
6.7.7	Summary of action	Person 2	Org2	23-Jun-04	15-Sep-04	At risk
6.7.6	Summary of action	Person 3	Org1	15-Sep-04	15-Sep-04	At risk
6.7.5	Summary of action	Person 4	Org3	ASAP	7-Sep-04	At risk
6.7.4	Summary of action	Person 1	Org1	ASAP	15-Oct-04	On track
5.7.14	Summary of action	Person 1	Org1	ASAP	ASAP	Critical

Figure 4.6: Main Action Item Columns

AP ref	Further Comments
10.3.4	These are the comments associated with an action item on the previous tab: + detail 1, + detail 2, + detail 3.
10.3.1	Another longer comment item here, over a few lines (Person1, 23Sep04). This was not confirmed at the next meeting (Person2, 4Oct04).
9.3.4	Another longer comment item here, over a few lines (Person1, 23Sep04). This was not confirmed at the next meeting (Person2, 4Oct04).
8.6.9	Another longer comment item here, over a few lines (Person1, 23Sep04). This was not confirmed at the next meeting (Person2, 4Oct04).

Figure 4.7: Additional Information on Actions

4.1.4 Project Planning Chart Improvements

In the reports and meeting minutes of one of the projects of this mission, a Gantt chart was included as a full-page figure (see figure 4.8). Many objects in the chart did not communicate any information, in particular the thick blue, red and yellow lines which covered the whole width of the chart, making them redundant in the field of vision.

The impressive thing about this chart was the fact that it was created using an Excel spreadsheet whose cell-size had been contracted to a minimum and whose gridlines formed the time intervals for the project plan. Indeed, the thick horizontal bars also had the function of vertical spacers in this chart. Coloured triangles represented milestones, red and

orange for intermediate goals and blue for external deliverables (such as Commission reports). The smiling faces indicated completed tasks.

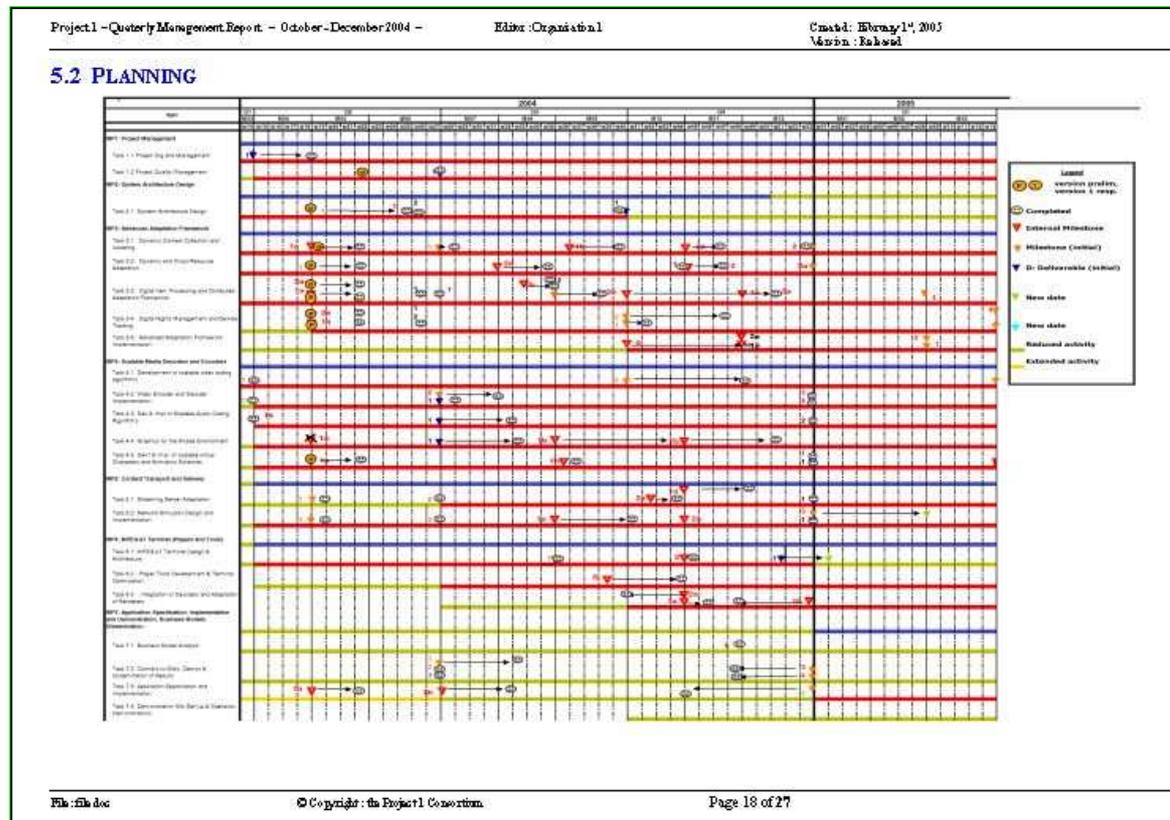


Figure 4.8: Original Gantt Chart based on Excel Spreadsheet

The spreadsheet had been sufficient for communicating the status of the project during its first 18 months but, it was very complicated to maintain and the possibility of using Microsoft® Project as an alternative had been mentioned. Depending on the type of Commission Report being prepared, certain types of task needed to appear and not others. For table enlargements and extracts, the horizontal lines were visual parasites for the positional information of the triangles.

The chart improvements were to resemble the original chart visual whilst facilitating its *maintenance*. Nothing was automatic in the original, the spreadsheet mechanism being used simply as a graphical representation tool. The triangular objects had to be positioned by hand without any automatic checking for coherency in the information being presented.

Consequently, a first step to improving the ergonomics of the tool involved automating the mechanism for updating the visual representation.

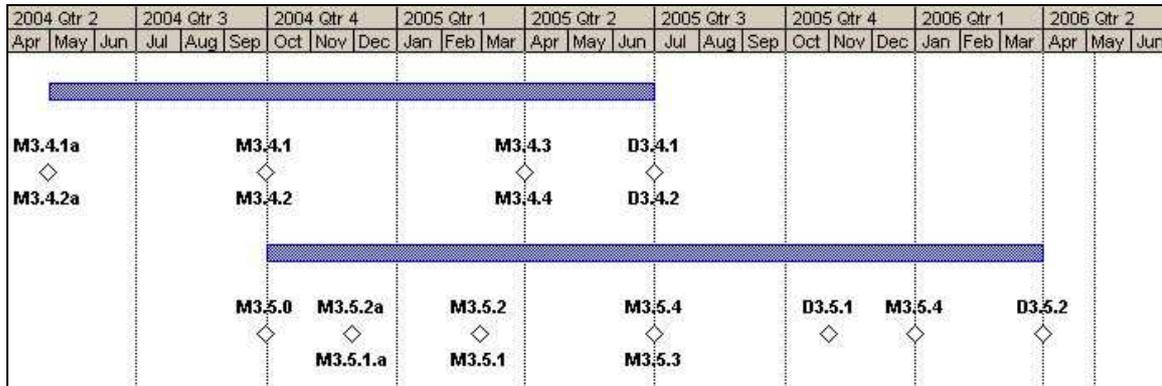


Figure 4.9: Example Planning Chart with Groups of Tasks and their Milestones

Ideally, one would have used the same tool to track the engineering tasks in detail as well as to generate the presentation format for Commission reports, such as “folding” tasks in the way of Microsoft® Project (see figure 4.9). This would have ensured overall information coherency whilst adapting the view of the data according to the interested parties’ requirements. (This principle of consolidating information by view can be applied to other tools, such as spreadsheet tables. For example, individual tracking tables can be consolidated into a global tracking table, perhaps used as a basis for a graphical representation).

In the tracking chart proposed to the client (figure 4.10) the graphical information generated by Microsoft® Project was based automatically on the task tracking data maintained in the corresponding tables of the tool.

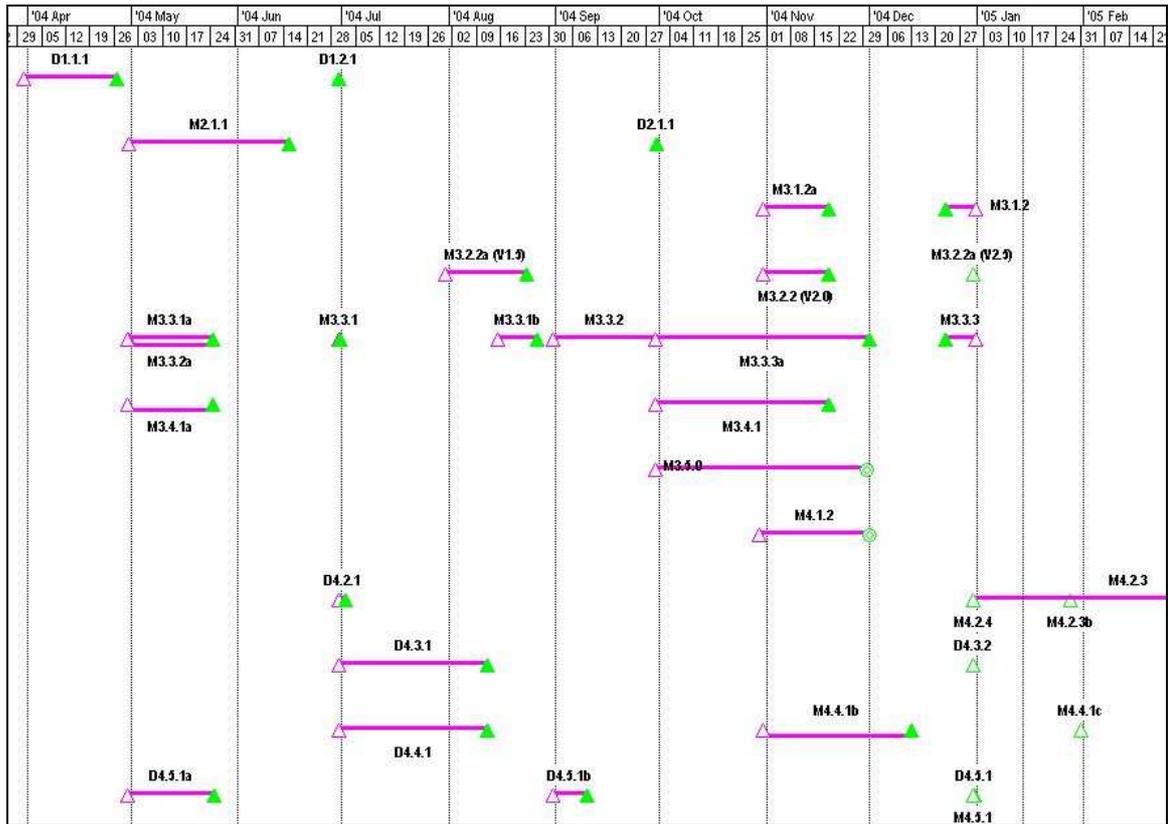


Figure 4.10: Proposition of Project Tracking Chart

Although the client appreciated the new presentation, they preferred to continue with the original manual Excel chart, no doubt because of the familiarity this chart had already gained with the project partners.

4.1.5 Geographically Distributed Project Coordination

It became apparent towards the end of the mission, that the Integration Phase of the same project, being prepared for the mid-project audit, was going significantly off-schedule. Support for the external client and Project Leader needed to be simple and efficient.

Although a detailed audit validated the existing integration plan, the complexity of the inter-partner communication had not been addressed. Contact between the participants of the integration phase was insufficient for coherent coordination.

Given the time constraints, the recommended action was to leave the information tools as they were and, to use the existing planning format as

a communication tool in project teleconferences and face-to-face meetings.

With this decision made, the communication between the people participating in the integration phase needed to be re-animated. The international and multi-cultural team was composed of 25 participating organisations, both enterprise and state research establishments, in more than 10 different countries, mainly France, Germany and the UK.

Two tools were implemented to improve and broaden the *communication* amongst this distributed team made up of consortium partners:

- An email update of partner progress every two weeks, with telephone follow-up in case of non-delivery: the conversations were handled in the preferred language of the project partner, a detail which contributed significantly to establishing an excellent *contact* with them;
- A monthly two-page report was prepared which summarised the state of the integration phase for the overall Project Manager, thereby improving their *contact* with critical progress details and identifying issues requiring their urgent attention.

By speaking the preferred language of the telephone correspondents (English, French and German), the author was able to open up supplementary communication channels¹⁷ between the partners. By using only email and telephone conversations, a dozen development groups were mobilised and the project *coordination* timetable realigned successfully. The virtual team had become coherent¹⁸.

4.1.6 Mission Evaluation: Project Communication

A general characteristic of the mission was the optimisation of project management tools, with the aim of facilitating the communication between people, thereby improving project coordination performance.

¹⁷ See section 2.2.1 : "What is Communication?".

¹⁸ See analysis in section 4.2.7 and also [P26].

Two observations were common to the key tools:

- their ergonomic optimisation was technically very simple;
- their optimisation depended on their context of use.

In each case, the optimisations were rendered pertinent through the methodology of initial *contact*, followed by rich and open *communication* with the users and the project environment, thereby facilitating adaptation to the *coordination* needs of the project.

- Action Item tracking and the importance of an efficient structure for reports;
- Optimising the communication value of tracking schemes such as Gantt charts;
- Improving the interteam communication of an international project to bring it back on schedule.

4.1.7 European Project Management Study

In both of the European projects of this mission with which the author came into contact, a lack of tools adapted to project coordination was observed. This is also the case for other European projects investigated. A study carried out during this mission^[P8] shows that the tools for sharing and managing information, for collaboration and coordination on these European projects are not shared between the projects but, instead, must be re-invented and re-implemented for *each new project*.

One of the key requirements of European projects is that tools remain affordable. With more than ten years' experience on European projects, consultants at the Rennes-based firm felt that no project management tool was truly adapted to the needs of major international projects. This was confirmed by the study which observed that existing tools were either too expensive or too specialised, requiring a high degree of specialisation to be used effectively.

The typical approach in major European projects is to communicate progress using Gantt-style charts, whilst the sharing of the information

content of the project takes place on an FTP^[I31] site. The result is a dislocation between the *management of the information* (tracking data, project deliverables) and the *coordination of participants* (interteam, hierarchical, transverse, international). To use the language of consultancy, existing tools do not promote *coproduction*^[P11] between the project participants.

One further comment to add to this functional dislocation concerns the efficiency of the mechanism used to distribute the project coordination *signals*. Since the information management platform is not integrated with the project coordination platform, these signaling mechanisms must be *manual*. Conversations with participants in the projects of this mission confirm that the mechanisms used to manage these processing flows, or “workflows”, are manual and non-standard, such as email or even the telephone.

The loss in performance is clear when a participant spends ten minutes looking through their emails, to find out whether another participant has completed a task upon which their work depends and, unable to find any message, ends up calling the person to ask them directly by telephone!

Fundamentally, there is no efficient *coordination* mechanism which **integrates** and **structures**, in time and in space, the *contact* and the *communication* between the entire set of **participants** on the project and their **referential** information bases.

Given the complexity of the reporting methodology used for the European Commission projects, an opportunity exists for a generalist and federating collaboration platform common to multiple projects. A first step in this direction would be the optimisation or adaptation of existing tools available on the market to the specific needs of European projects.

4.2 *Multinational Corporation Projects*

In the second mission, another distributed team example, an international telecom manufacturer asked the author to develop the project management environment for its EMEA¹⁹ Wide Area Network (WAN) service and operation. Although the coordination involved over 30 simultaneous infrastructure projects in 37 countries, the adaptation of the project management tools, as always, needed to remain simple.

4.2.1 **The MNC Context**

In the MNC²⁰ context (multi-site, multi-team), director-level management has a need for high-level consolidated communication, geared to political and budgetary decision-making. At the same time, active participants in the project, such as engineers and administrative roles, require much more technical detail in their tracking information. A single tool able to manage both of these requirements from the same data source was not available.

The corporation was going through a period of unprecedented change due to the evolution of the telecoms industry. Throughout the restructuring process, isolated collaborative applications, such as NetMeeting^[129] and a WAN service web site, remained available.

Of the resources to be managed, the most significant was not the web or email communication tools, nor was it the budget, although, of course, these were all highly important. It was time, that is, people's availability for teleconferences, supplier's ability to deliver on schedule, process delays within a mutating customer organisation. Indeed, an entire methodology of project management had to be developed on a specially adapted web site and had to be very flexible.

¹⁹ Europe, Middle-East and Africa

²⁰ Multi-National Corporation

4.2.2 Methodology Applied to the Mission

The fundamental value of a document is the fact that it exists. As we have seen in previous chapters, the format of the document is important but it is only one part of the link of knowledge created between the user of the document and its contents.

As with the mission in the previous section, the methodology was based on making *contact* with the participants in the projects. A pre-project audit established contact with all players of the ITC management process. User feedback enabled information presentation formats to be modified frequently to adapt to changes in user *communication* needs and technical constraints. Care was taken to maintain coherence between the referentials throughout these changes. This agile and pragmatic approach to adaptation of the data-sharing mechanisms helped the information platform to become an efficient *coordination* tool.

This approach is particularly pertinent in ITC projects where the partnering teams are usually of different professional cultures, such as purchasing and engineering as well as the increasingly diverse community of application users.

With each new infrastructure project, the participants brought their respective technical expertise. The Project Manager adapted the communication platform (meetings, website, report formats, etc.) to the users' way of communicating, using it as a referential and impartial interface between different teams with different communication cultures.

4.2.3 Applying the Expert Interface Model

As we have already seen in section 3.3 , the various distinct projects of this mission all involved liaison between the same critical partners:

- Suppliers (represented by the purchasing department),
- IT and network engineers in multiple locations and,
- A variety of User Groups (labs, corporate branches, etc.).

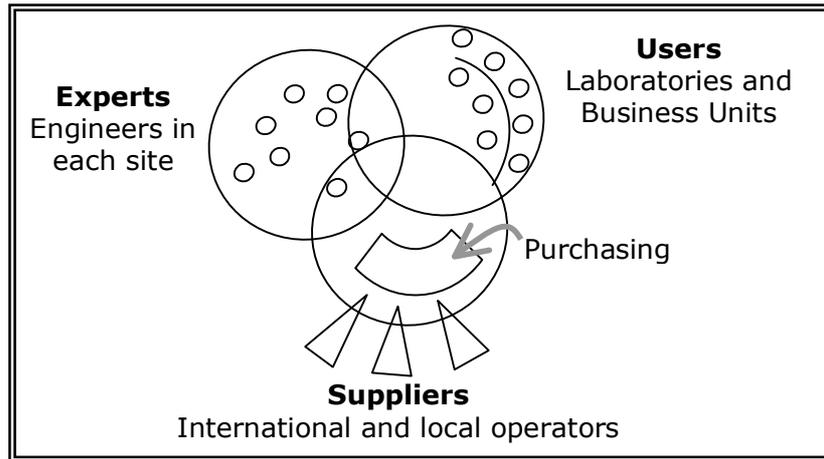


Figure 4.11: Opportunity for Mediation between Complementary Teams

There was not a common language between these activities, shown in figure 4.11. Each entity spoke their own professional jargon and had difficulty seeing the priorities of their partners. The challenge for the Project Manager was to facilitate the intersection of coordination between the people in these multiple activities through a common communication platform.

In its most basic form, the success of the mission depended upon the communication of user requirements to the engineering team who, in turn, needed to express their supply requirements to the corporate purchasing organisation. In this system of interacting teams, successful infrastructure deployment depended upon adapting the resources of each team to the strategic requirements of the organisation, which meant understanding in detail how each team functioned.

The professional cultural differences were more significant than the international country cultural differences. Respect for each entity's regional and professional cultural differences allowed for efficient interfacing and the creation of a genuine team environment.

Improving team interfaces built foundations for future projects and lead to efficiencies, such as in billing accuracy and timely delivery, both of which generated cost savings.

4.2.4 Multi-Partner Infrastructure Management

The internal corporate customers on this mission each had special requirements involving four or five tiers of project partners. These included: corporate financial services, supplier management, ITC engineers and, of course, the user groups in research labs or commercial business units. Each service implementation involved a complex chain technical interfaces and supplier responsibilities with an overall budget control.

As an example of a supplier system from this mission, we have Sam in London and Peter in Munich who need to share application resources. The supplier system (but not the technology!) might have involved the partners shown in figure 4.12.

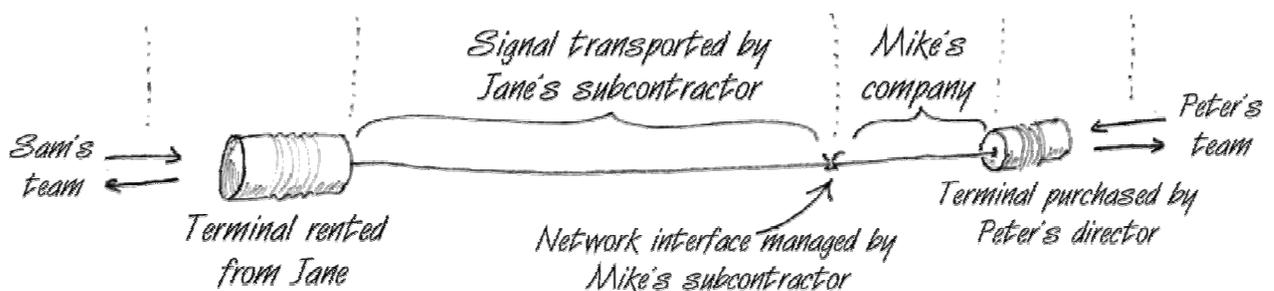


Figure 4.12: Partners Sharing Responsibility for a Data Network Link

Two fundamental management issues existed:

- accurate and timely identification of user requirements and,
- accurate and pertinent communication of requirements to implementing engineers.

They both involved the following communication issue:

- Adapting the information at each interface between teams, so the essence that was critical to the end users would successfully pass from one team to the next. The challenge was to adapt between the representation systems, value and performance contexts of each team.

By ensuring service accurately reflected needs at each interface, contract negotiations were facilitated. Providers understood the effect of their performance on the overall project and the entire *supply chain* became more transparent.

Provider SLA Tracking			720.00 (h:m) = total possible uptime for a circuit this month		
Provider	Actual availability	15-Jun-03	Total # circuits for EMEA	Total possible uptime (h:m)	Actual total
Provider1	100.0%		7	5040:00	0:00
Provider2	97.3%		11	7920:00	217:40
Provider3	100.0%		9	6480:00	0:00
Provider4	100.0%		7	5040:00	0:00
Provider5	100.0%		6	4320:00	0:00
Provider6	99.3%		11	7920:00	57:59

Outage report detail for: Apr-03																
Provider	Main Site	Remote Site	Start (UTC)	End (UTC)	Duration (h:m)	Monthly downtime	Trouble Ticket	Penalty Form submitted	...by	Penalty Form acknowledge	...by	Months to acknow.	Penalty amount	Credited	Months to payment	Comments
Provider1					0:00	0.00%						0.0	\$ -		0.0	
Provider2	London	Swanage	14-Apr-03 13:06	17-Apr-03 15:33	74:27	10.01%	NA	18-Apr-03	JTR	22-May-03	P3uE	0.0	\$ -		0.0	No outage penalty possible.
Provider2	London	Swanage	17-Apr-03 17:00	23-Apr-03 16:12	143:12	19.25%	NA		NA		NA	0.0	\$ -		0.0	Outage caused by deletion of circuit during attempt at upgrade operation.
Provider3					0:00	0.00%						0.0	\$ -		0.0	
Provider4					0:00	0.00%						0.0	\$ -		0.0	
Provider5					0:00	0.00%						0.0	\$ -		0.0	
Provider6	Munich	Hochkirschen	7-Apr-03 12:36	7-Apr-03 18:26	5:50	0.81%	1235543	17-Dec-03	JTR	24-Dec-04	Mikel	0.0	\$ -		0.0	Outage within SLA tolerance.
Provider6	Munich	Hochkirschen	12-Apr-03 8:57	14-Apr-03 13:07	52:09	7.24%	1235549	14-Apr-03	NA	14-Apr-03	automatic	0.0	\$ 132	25-Jun-03	2.4	Problem with incorrect delivery.
Provider6					0:00	0.00%						0.0	\$ -		0.0	
												\$ 132				

Figure 4.13: Tracking Individual Supplier Service Level Guarantees

This communication was facilitated by the Project Manager since no common information platform existed for this mission. As an effective tool for stimulating provider performance as well as ensuring accurate director-level interpretation of project results, factual databases with performance information were created and maintained on a daily basis. The individual service issues were tracked in a detailed spreadsheet using Microsoft Excel (see figure 4.13). Graphical consolidated views were generated within the same Excel file and served as a decision aid for upper management responsible for strategic Supplier Management decisions (figure 4.14).

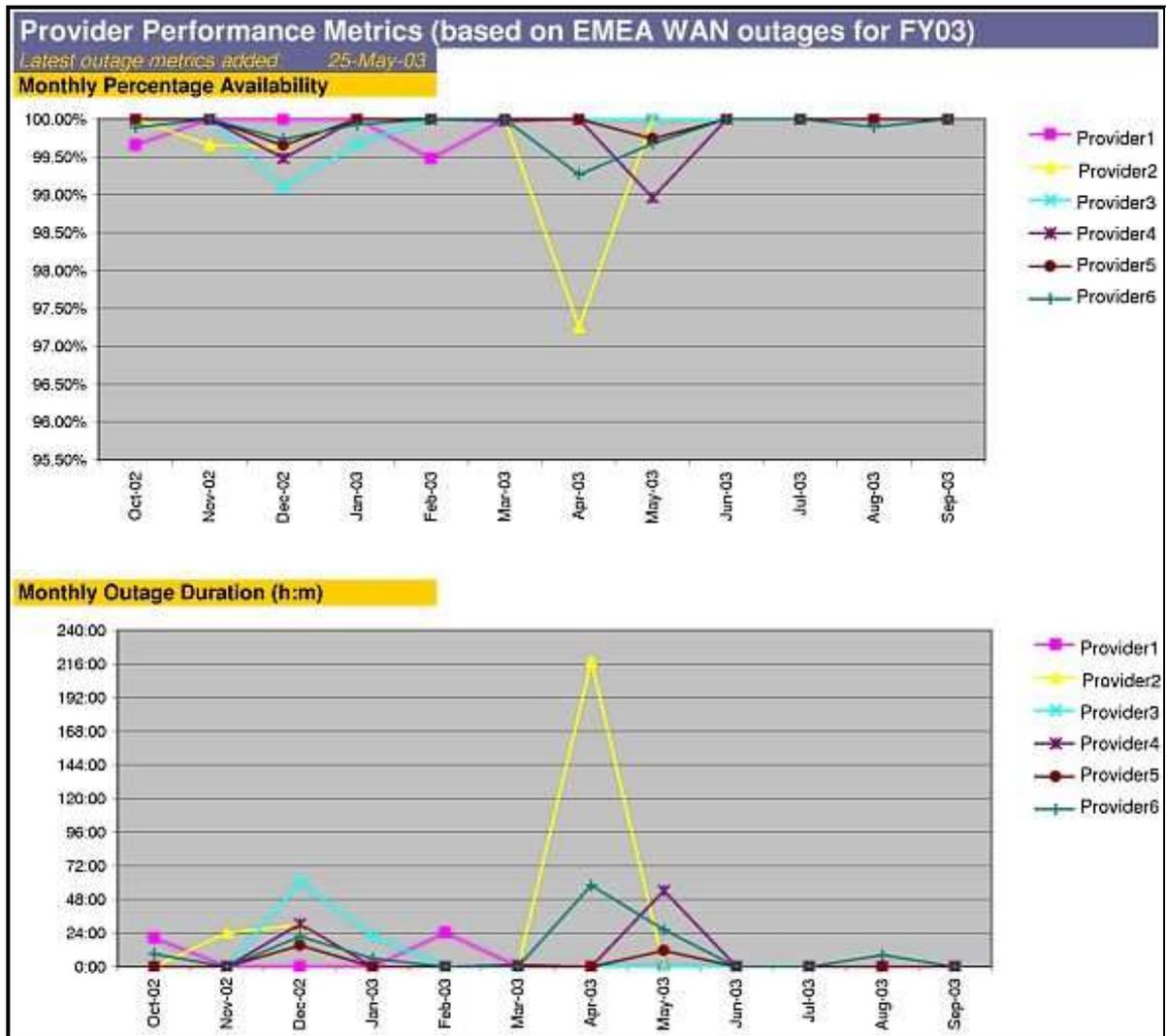


Figure 4.14: Consolidating SLA Tracking for Supplier Management Reporting

Part of this SLA²¹ tracking could be considered helpdesk support. Indeed, the author worked closely with the corporate helpdesks to obtain accurate information. However, the format provided by the helpdesks was not adapted to the management reporting for which the consolidated graphs on this page were used.

4.2.5 Structuring Meetings

Working in weekly meetings with each customer and in separate meetings with each supplier, it was possible to construct an accurate mapping between the customer requirements and the supplier reliability.

²¹ Service Level Agreement

This high frequency of *contact* with the project partners was a successful method for controlling the overall budget and infrastructure system performance since it provided opportunities for correcting partner misunderstanding, managing cost surprises, performance issues, etc. Such *communication* discipline was essential for risk management and an ideal platform for controlling both supplier-facing and customer-facing escalations.

Priority: Black=Low, Yellow=High, Red=BusinessCritical, Bold=MissionCritical

Comments	Actions	Owner
<ul style="list-style-type: none"> Site support for Frankfurt: <ol style="list-style-type: none"> Joe Smith Michael Rogers (TO BE CONFIRMED). 	Obtain confirmation from Michael's manager.	JTR
Platform Liaison Maintenance actions	Tracker: JTR	
A new agreement is being negotiated.	Update in next meeting	JTR
There is no support for the older boxes in any EMEA country. We do have some spare parts, for now that is what is keeping us going. (JTR, 2Feb04)	-	-
Outage Management (see also Provider Performance summary)	Tracker: PMN	
Going forward, we will briefly review the outages of the previous week in this meeting. They will be summarized in quickplace.	Check how to create text summaries and post outage list in qp.	PMN
02010BBWAN Baytech deployment	Tracker: WSH	
Cables from the UK have been distributed to the five remaining sites. (James, 23Jan04).	Jeff will update qp tracking and LNOC.	JTR
Request for Authorization needs to be submitted for further 10 cables.	Publish request to managers responsible.	WSH
Closures in progress: <ul style="list-style-type: none"> Bonn (31Jan04): see also 04006BBVPN below. Birmingham move: see 04003BBSLA Milan (31Jan04) 	Update on Madrid?	JTR
04009BBWAN Provider3 Red	Tracker: STY	

Figure 4.15: Design of Meeting Minutes for Pushing Action

The highly-simplified meeting minutes format proposed and later used by other teams as well, is shown in figure 4.15. Although the column headings are different and seem to be reversed, the neurological ergonomics identified in section 2.2.2 have been applied. That is, the static *reference* to the activity is in the left-hand column (called "Comments", here) and the preparation for *future* activity is in the right-hand column (labelled "Actions"). Individual ownership is tracked in the third column but also with date information in free text format within each comment. Hypertext links^[130] have been included wherever possible, when referring to other projects or pages on the website. This augmented the ergonomics noticeably for users and received praise from IT directors.

In terms of tools used, the maintenance of the page format was manual using only Microsoft Word as a text editor for the site pages.

4.2.6 Integrated Reporting by Web site

Aswell as the provider performance tracking and meeting minutes sharing described above, various other inventories were shared in the common information base: equipment, network circuits and team contacts for sixty participants.

The first site was a home-made web site which, although not sophisticated, was a very simple and effective integrated project tracking platform. The major drawback of the platform was that only the project manager could modify it. Pages were handwritten and a presentation format for the site had to be created.

During one of the restructuring phases, the first platform was migrated to a collaborative file storage system called Quickplace^[P40]. The new system provided a standard site presentation format and allowed concurrent access to pages, an advantage which outweighed the presentation inconvenience and boosted team performance.

Neither website had any integrated support for project tracking tools, such as Gantt charts. Project information was presented in simple tabular form. A consolidated view that was developed for this mission is shown in figure 4.16. This table shows, at a glance, the status of a particular network project. Whenever possible, the project identifier, in the left-hand column, used a hypertext link (see "A" in the figure) to jump directly from the consolidated view to the detailed tracking table, such as the one shown in figure 4.17.

EMEA WAN action tracking

Project ID format: <year> <Serial Number> <country ID or "BB" for Core Network> <BU or Application Type >
Project Status Key: **Blue**=planning; **Green**=on plan; **Yellow**=potential jeopardy; **Red**=jeopardy; **Black**=complete
Customer: BB or MultiBU, BU1, BU2, BU3, BU4

Last updated: 29th January 2004

Active Project Total: 15

Project ID	Location	Activity	Status	Details
02010BBWAN	EMEA-wide	Deployment of special network boxes at most remote locations on WAN.	Yellow	<ul style="list-style-type: none"> Design plan deployment Action Tracking spreadsheet Problems getting the correct cables from the supplier; shipment expected week of 30Jan04.
04003BBSLA	Ireland	Deployment of infrastructure to support specific high-availability needs in Ireland.	Green	<ul style="list-style-type: none"> Ireland Action Tracking spreadsheet Ireland Design
04004BBREM	Germany	WAN support to major REM Cost Savings Initiative.	Green	<ul style="list-style-type: none"> REM Action Tracking spreadsheet
04005BBVOW	EMEA-wide	WAN improvements for voice service.	Blue	<ul style="list-style-type: none"> Data collection
04008BBSCM	Germany	WAN support for SCM project	Blue	<ul style="list-style-type: none"> Data collection
04009BBWAN	Spain	Restructure of southern EMEA WAN	Green	<ul style="list-style-type: none"> Spain Action Tracking spreadsheet

Figure 4.16: Consolidated Project Tracking table

04009BBWAN: Spain Redesign Task Tracking spreadsheet														
Updated: 28-Jan-04														
Owner	Action details	Planned dates			Designed slide (weeks)	Requirements	Actual dates					Online slide (weeks)	Comments	
		Designed	Online	Duration (weeks)			Designed	Bus.Case approved	Order available	Ready to test	Tested & online			Duration (weeks)
JTR	Madrid-Barcelona 2Mb/s circuit	21-Jul-03	29-Aug-03	5.6	0.0	20-Aug-02	21-Jul-03							
PMN	Madrid-Seville 2Mb/s circuit	30-May-03	30-Jun-03	4.4	4.4	1-May-03	30-Jun-03							
PMN	Madrid-Munich 10Mb/s backbone circuit	30-May-03	30-Jun-03	4.4	4.4	1-May-03	30-Jun-03							
JTR	Router installation Barcelona	1-Dec-03	31-Dec-03	4.3	0.1	1-Dec-03	2-Dec-03	3-Dec-03	4-Dec-03	23-Jan-04				
CLY	Router installation Seville	30-May-03	29-Aug-03	13.0	8.6	1-May-03	29-Jul-03							

Purple shade => Needs attention!!!
Yellow shade => estimated

Figure 4.17: Detailed Project Tracking table

The format, as for the meeting minutes, takes into account the neurological features for ergonomics mentioned in section 2.2.2. Of the two largest columns, the static reference to the activity is in the left column and, the preparation for future activity is in the right column, called "Details".

4.2.7 Mission Evaluation: Reaching Coherence

A number of individual pan-European deployments of network infrastructure have been coordinated using the tools and methodology developed during this mission. The success of an ITC (Information Technology and Communication) project depends on the efficiency of the communication between the teams involved. The Project Manager has a key role to play as mediator and facilitator of this inter-team communication.

The previous sections show a number of project tracking mechanisms in isolation on the web site. The only integration between the different referentials is the hypertext link. In particular, the sequence of project steps with dates shown in figure 4.17 would benefit from integration with a Gantt chart representation format. An integrated tracking platform would enable seamless harmonisation between the various presentation formats presented in this mission report, thus improving project management performance.

The choice of communications technology is usually less critical than the performance of each interface between provider entities. An integrated platform would also facilitate *synchronisation* across organisations.

Schmaltz^[P25] refers to “coherence” within a team in the same room. In this mission we had a situation where collaborative technology adapted in the appropriate way became an enabler of extended *team coherence* over a timescale of days and weeks (rather than hours) and over significant geographical distance.

5 Conclusion

This paper has explored how the communicating aspects of project tools can be adapted to create lasting links between people in support of long-term project management. The case studies and examples have confirmed that making ergonomic improvements to these tools creates opportunities for strengthening contact between participants, improving communication and leading to better performance in the coordination of a project.

The examples have also shown that the steps to improving project communication are very simple and require no expert knowledge in the fields of ergonomics, communication theory, neuropsychology and behavioural science. The improvements are successful because they focus on the needs of the users.

People are the key. They share what they perceive as important to their work. Tools are simply a means to communicate. Project management success depends directly on the quality of the link between the people. As for a team in the same room, collaborative technology adapted in the appropriate way can become an enabler of extended *team coherence* over a timescale of days and weeks and over significant geographical distance.

Good communication is an enabling factor for the synchronised coordination across multiple distinct organisations, in a similar way to “just in time” logistics in the automobile industry. The need for such synchronisation can be observed in the European and multinational projects presented in this paper but also in the medical domain which has its own special requirements of reliability, rapidity and cost constraints.

A conclusion, which can be felt throughout the paper, is the opportunity for the development of a project management platform which integrates and federates the techniques described with a view to optimising and perpetuating the management of projects in the context of multiple teams. There may be an opportunity for cross-fertilisation of ideas between the field of logistics and that of general project management.

The need has been identified for a generic integrated project management platform, allowing detailed and synthetic project tracking and reporting, structuring communication and facilitating participant coproduction, generating automated project events and providing centralised project analysis for strategic project management. No such integrated tool has been found that is simple, powerful, ergonomic, adaptable and available for the average research and development project on a tight budget.

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