# Communication in product development in an alliance setting.

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Abstract

This paper deals with communication across functional and cultural borders in product development in an alliance context. It shows how the multiple levels of co-ordination in an alliance increase complexity. Product development takes place in meetings in a nexus of meetings. Communication is studied by the use of video. Sequences from such recordings are played back to participants who assist in the interpretation of communicative situations. It was found that participants tend to become myopic in their attributions of implications of behaviour in meetings, which hampers communication efficiency. It is suggested that Complexity Theory provides an explanation and that a solution can be sought in feedback of video sequences and reflection on communication problems.

**Keywords:** co-operative product development, alliance context, contextual complexities, ways of working, implications of behaviour in meetings, observation methods.

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## Introduction

The alliance is a blatant breach with the received wisdom (Porter 1980, 1985) since it tries to achieve, at least for one of the partners, two strategies at the same time, cost leadership and differentiation. Porter (1980) presents the cost leadership strategy as one where the experience curve is exploited to achieve low cost and high capacity use, i.e., lean production (Salter 1960, Womack et al 1990), while the differentiation strategy is deduced from monopolistic competition (Chamberlain 1933) and aims at the establishment of a unique position in the market based on customer value. The product is given a specific profile that makes it difficult to compare the price with that of competing products. The latter case is hardly compatible with a large market share while the first strategy more or less presupposes a large market share. It seems, however, that cost leadership strategies are sustainable with fairly small volumes due to flexible technologies, modulation and that differentiation can be achieved through customisation. Lampel & Mintzberg (1996) maintain that "the most striking recent trend has been not toward pure customization, but toward some middle ground that we call customized standardization" (ibid p. 22). In the terminology of those authors the alliance seems to be oriented toward becoming a "Menu Industry". However the two parties in the alliance of this study approach the "menu industry" from two different starting points. Mitsubishi Motor Corporation (MMC) from a mass production, lean production, philosophy, and Volvo Car Corporation (VCC) from a niche oriented strategy where a move upwards in the segments is visible. Both parties want to learn from each other: lean production and customised distribution in Europe respectively.

Such a transfer of knowledge is not an easy process since the skills that go into the design and production of a car are to a large extent tacit (Polanyi 1962). Furthermore such knowledge is embedded in the "ways of working" of both cultures and as such less accessible than might be assumed. It is not enough to understand the procedural aspects of the ways of working but in addition it is necessary to understand the social and organisational context in which these procedures are embedded. Lam (1997) argues persuasively that in a co-operation between British and Japanese engineers knowledge is likely to flow from the task-specific sequential British structure to the diffuse overlapping Japanese structure. This is because the "scientific" culture of British engineers simply makes knowledge more accessible to "outsiders" than in the Japanese practical and group oriented storage of knowledge. One might add that the British firm risks losing competent engineers when the external job market is good while the Japanese

firm largely has employees schooled in the tacit "competences" developed internally. It is quite possible that any new skills that are extracted from co-operation across cultures may be largely useless because the organisational routines which contain the respective skills are too embedded in the cultures to be transplantable, except in the form of consultant designed/translated routines with "exotic" labels. (Czarniawska & Sevón 1996, Latour 1986).

It is this embeddedness of knowledge that we want to unpack to some extent in this paper. The object of study is the MMC-VCC alliance, but here we focus on only part of that alliance, product development of the Volvo year models produced in the alliance which involves Swedish and Dutch engineers.

The core of the alliance is industrialisation of production of a compact car built on a joint platform. This means that even if MMC and VCC are competitors in the same market segment they use a joint assembly plant and make every effort to achieve economies of scale through commonality of components. The joint assembly plant is constituted as a limited company owned by the two partners (and the Dutch State). The VCC and Dutch State side provided the physical plant, while the starting platform was contributed by MMC. Both contributions have developed considerably since the alliance started in 1992. Commonality has decreased as the partners pursue different market niches. Dutch personnel to a very large extent man the production company, NedCar. The alliance partners have a few advisors inside NedCar but it is a Dutch company. The two main owners of NedCar agree that the main purpose of the alliance is to achieve lean production. Therefore NedCar is under intense pressure to reduce cost. The number of employees has been halved and production doubled during the alliance so far. At the same time the pursuit of customer value constitutes a driver towards a proliferation of variants for the different markets in Europe and globally. It is NedCar, the production facility, which is subjected to these pressures, lean production as well as frequent introductions of new variants. Its engineers (Process Engineering, Production Control, Project Management, Purchasing, Quality) try to stem the tide of variation which is likely to disturb the lean production flow in every conceivable way.

In relation to VCC they can act in the design phase for car models where they are represented in the project management team and where they can express suspicion towards every "study" of new solutions to design problems, explain the costs of final assembly and tool investment that alternative designs will entail. They can preach the blessings of reduced number of articles, sub-components and components. But most of the time it is in vain because the customer oriented design engineers find strong arguments in favour of their proposals in market intelligence reports and test results.

Customer value increases revenue and brand value, while lean production reduces product cost or holds it in line with cost targets. The customer value orientation of the VCC approach to product development among other things tends to expand project content (and budgets). The mechanism is quite simple. The project to develop next year’s model is controlled by a contract with the Board of Directors and its enclosed system of "gates" where time, cost and technology prerequisites are defined for the release, after close scrutiny, of the next phase in the project. The gate to the next bundle of financial resources are opened. But there is a parallel process of Quality improvement where customer complaints and other market information together with test results generate short term projects for improvement which are introduced as running changes on the current model. A vigilant project leader can make use of these projects to expand project content. However, in this alliance the production plant is a separate company. This means that there is also a contract relation between the year model project and the production company. Any change in the content of the project must be negotiated with the NedCar organisation since the originally agreed content and properties of the new model determine the target price of the car and, to a considerable extent, the budget. Still the strong urge towards customer value tends to add features and variants as the projects proceed towards mass production start, and the NedCar organisation is forced to accommodate. After all the two alliance partners are owners as well as customers!

In this situation the Dutch engineers representing NedCar in the projects come to represent the lean production values in the projects, while most of the design engineers as a matter of professional pride represent customer value views. This is a classical and usually quite productive tension. In the alliance the potentiality for misunderstandings is increased by cultural differences, small as they might be, between Dutch and Swedish ways of working. There is, for instance, a Swedish tradition of teamwork where authority to make decisions is delegated quite far. In reciprocity subordinates are expected to tell their boss if they have problems. This means that the Swedish boss, with a slight oversimplification, can

sit in his office with an open door assured that if something goes wrong he will be called upon to help. This will be looked upon by the Dutch as passive leadership, because among the Dutch colleagues there is a tendency to delay bringing problems to the boss' attention until you have a solution to propose. As a consequence the Swedish boss with Dutch subordinates will have to learn to be more active in search for problems, while a Dutch boss with Swedish subordinates will be thought of as interventionist and bossy until he has learnt to trust that subordinates will sound the alarm if there is a problem. The leadership style will have to be adapted to the context. Making sense of the context for new arrivals seems to be a major problem in the two development teams we have followed closely during the last 1.5 years. Also those who have been there for some years have difficulties due to the "learning" that all parties engage in. Things are complex and changing!

Contextual complexities

1. Complexity in space.

The structure of the alliance generates a need for co-ordination meetings that abound. A central justification for the alliance for VCC is to learn lean production, while the MCC partner wants to learn how to approach the European market. The fact that both partners need to steer their new variants towards the joint lean production system creates a queue situation with all trial series that have to be fitted into the flow of production of the current models. Negotiations are necessary. The production unit in the form of a jointly owned Dutch company is under pressure to achieve lean production according to the standards set by the owners on the basis of their experience of more "single-purpose" plants. The three parties meet in a regular Executive Committee New Projects to inform and decide on co-ordination. The parties also meet in the board of directors of NedCar where the owners tend to apply lean production pressure. These and other meetings provide hierarchical structure in relation to the product development teams. Then there is the Business Area organisation, which represents market pressures on design and properties and which is represented as Product Planning in the development team itself. The same goes for VCC's Quality organisation. Then there are the meetings that relate to platform issues and commonality of components as well as more specific meetings around components like the GDI engine that was developed by MMC but is also used in the Volvo car. The project is embedded in a "nexus of meetings".

There is a "line" organisation in VCC, for instance the Engine department, where basic research on the relevant technologies is conducted, that provides personnel to the projects. An engine engineer must conduct himself/herself as an engine professional and maintain good relations with the home office in order to be able to solicit support in problem solving in her/his project tasks.

There also are an innumerable number of meetings with suppliers, many of who participate in development work with technical centres dispersed over the world. Some of these suppliers are big companies with bigger customers than VCC. There is co-ordination between suppliers. For instance there is a microprocessor, developed by Siemens, which controls the engine. When every car is equipped with an immobilizer (so you cannot start the engine without the proper code), this engine unit must be co-ordinated with another electronic device where the driver enters a code. Bosch, a competitor of Siemens, develops this latter unit. In order for the signal between the two units be undetectable crypto has to be used, and the project's electricity engineer in charge will have to travel between the two competitors in order for the receptor to be in tune with the sender of the coded signals. Bosch does this development work in Australia.

The project itself is divided into the functional areas of the car (Engine, transmission, chassis, electricity, etc) plus some market related areas like Properties, Exterior, and Quality. Each such design area is called a System Task, which is headed by a ST manager. These ST managers are members of the Project Management Group (PMG) which is in focus of this study. There is one PMG for each year model. Each ST is divided into a number of Construction Tasks (CT) with a varying number of engineers in each. The STs and the CTs have meetings to co-ordinate work also across STs. Especially Electricity is effected by most changes and will have to redesign circuits, processors, connectors and cabelage in response to changes in other areas. This means that when a proposal or a solution is presented in the PMG meeting it will have to have been scrutinised in many different meetings before this decision occasion. In those briefing meetings different kinds of compromises and commitments are made. These cannot be checked

in detail at the PMG meeting and therefore the presenter has to be trusted. If somebody starts to ask questions it might be interpreted as a sign that something is wrong, and willingness to go along with the decision will be effected. It is important for the members of the PMG to maintain trustworthiness. This is done by behaving adequately in meetings (and by doing a professional engineering job.) A product-planning engineer (representing the customer values) said that during the last year he had more than 75 % of his working hours per week in meetings. It is obvious that in order to be effective in this maze of meetings a design engineer must make good use of his or her social network. Complexity is added to by the number of organisational boundaries that have to be crossed in an alliance like this one.

2. Complexity in timing

A year model project is strictly controlled by its time plan. Timing is followed up in a systems of "gates" (10 gates) which are check points where the project has to report that specified requirements (on technology, cost, time, quality etc) are met in order for the next phase of the project to be released. The metaphor at play here is that "the gate" is opened when the project passes the test. However it is not reasonable to stop work altogether because there is trouble with the 5th gear of the automatic gear box for one of the variants, so it happens that the project is approaching gate 5 on some aspects before it has passed gate 4 on some other aspects. Thus even if the gate system is supposed to discipline the project it is not adhered to rigidly. But it is important to maintain the pressure to hold on to a set time schedule (which is usually determined by planning "backwards" from a specified market introduction event - like a car show). Perhaps the most important motivation to hold time schedule is to see that the other participants have their part of the project under control. The project meetings therefore serve as reassurance that the others are under pressure too and that they are coping. The ST manager who reports that he is not able to deliver loses face, and when the project leader announces that the time schedule will have to be renegotiated it causes emotional eruptions. ST managers have their subordinates under pressure by holding the given dates as holy. They are also constantly negotiating lead times with suppliers who participate in the design of components. Having stated that the dead line is literally a matter of life and death and then take it all back and say that something else is a mater of life and death may have a disastrous effect on morale. Thus an important sideline in the project is to keep track of how the others are doing. (If engine cannot deliver component X until week 45 there is no reason for Transmission to waste energy on getting their corresponding component ready by week 40). There is an informal keeping track of lead times and a continuous re-evaluation of priorities. One must be well informed to function well in the team.

The "gates" are often tied to trial production series that are in turn scheduled to fit various test programs. These trials will result in aggregations of "remarks" which have to be given solutions before the next tryout. Priorities must be applied wisely as design engineers work around the clock during these stress periods as the project approaches production start. Remarks are registered on Product Improvement Request Forms (PIRFs) by, e.g., the Production Control department or by Testing. Project meetings are focused on the backlog of unsolved PIRFs at certain stages. There are also requests for problem solutions that are channelled from customers' complaints via the Business area, Quality department and Product Planning. Such solutions can be targeted for "running change windows" or be included in the project plans.

The (lean production) NedCar organisation, naturally, is not very keen on changes to original time plans since such changes will upset the smooth flow that was optimised in the plans.

Thus time is always present in the project. Every item on the agenda includes a time commitment on which other commitments are built. Furthermore every item on the agenda is given a certain number of minutes. It has to be well prepared for the PMG meeting to flow smoothly.

3. Complexity in information

A classical and simple definition of information is that it removes uncertainty. There is however a whole literature on information overload, i.e., when more information causes blockages. Furthermore in a context where participants are considering problems and where information is assumed to be transposed into action (building a marvellous car) meaningfulness is achieved in context. Relevant contexts may be the respective experiential background of the sender and receiver of information in a dialogue, and the task context. In addition to this the message can be more or less well formed (this latter problem is ever

present in multi-cultural settings like an alliance where most participants communicate in a foreign language).

Making sense (Weick 1995) of information or events consists of identifying the actor and the actor's intentions. Meaningfulness also presupposes that the actor is following a rule, i.e., the actor will act in a similar way in a similar situation in the future (Wittgenstein 1951, Winch 1958). Communication runs the risk of becoming overloaded with meaning which will lead to misunderstandings as to what rules are followed as well as what intentions are signalled. Every statement in a meeting will have several levels of meaning in the sense that there are task-related meanings as well as team building meanings, procedural reflections, and career promotion.

Human beings in social interaction normally follow the Cooperative principle when they interact in conversation (Grice 1975/1989, p. 26): "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose of the talk exchange in which you are engaged"

This principle may be broken down into four maxims:

Quantity (say neither more nor less than is required)

Quality (speak that which you believe to be true)

Relation (be relevant; a question requires an answer etc)

Manner (avoid obscurity, be clear)

The point is that we can imply things by breaking any of the four maxims. For example:

A: How is Charlie doing in his new job?

B: Oh, all right I guess, he likes his colleagues and he has not been arrested yet.

B breaks the first maxim (Quantity) by saying more than is required and A will work out the implication by the following kind of reasoning:

1. He said X (arrested yet)

2. He could not have said X unless he thought Y (that Charlie is involved in criminal activities)!

3. He knows that I will think Y when he says X!

4. He has implied Y!

Working out implications of what is said is a continuous activity in conversations. Managers typically work with words. Misunderstandings appear in this process of working out implications. These are difficult to control for, especially in multi-cultural settings.

In our observations of project meetings and in interviews we often see references to "ways of working" which seem to be a way of summarising sets of behavioural rules which teams develop (Jönsson 1998). The other part of sense making, beside the attribution of rule following, is attribution of intentions, which may be seen as task oriented and/or as relational (maintaining team cohesion or competing for promotion). All this means that in project meetings there are more than one thing going on at the same time, and even if participants nod in agreement they may do so on the basis of completely different understandings.

Beside "ways of working" as a source of misunderstanding there are numerous occasions where differences in the logic and structure of systems are seen as causes of misunderstandings or of debate. For instance the way design concepts and specifications of early designs are registered into systems can differ between participating organisations (be it alliance partners, design vs production, or sub-contractors who do design work). It seems like the supporting systems become part of roles or identities implied by "ways of working". It seems like design work is disrupted when participants try to

accommodate two systems (or think in terms of two conceptual frameworks). This is demonstrated by recurring debates in the project management meetings. One possible explanation to this may be the difficulties of arriving at intended implications (Grice 1989) when two or more logics are in use in the group at the same time. It is in the very nature of implications that they are not confirmed by explicit statements. Rather body language, a nod or a gesture indicating attention or, maybe disapproval is used. In the case when the implication is not understood, or misunderstood, efficiency of communication will suffer. This may be assumed to be independent of the technical/professional competence of the participants. However skills in presentation might have an effect (i.e., "surface" may be more important than content in this kind of situation).

Project teams develop different ways of working. This is quite visible to an outside observer following several teams and to participants in dual teams. It is necessary to start the work on year model x+1 before the team developing year model x is finished. It is a policy in the studied company to transfer experience between the year models by having an overlap of as much as 50 % of personnel. However, one project may generate its ways of working from the fact that the lead theme is to install new engines (stronger or greener or both) while the other project is characterised by the task to prepare a line of variants for e.g. the American market. In the latter case engine designers set the tone in the other the business area representatives. The choice of project leader is likely to be influenced by the lead theme of the project, and the project leader definitely has an influence of communication patterns in the team. This puts strain on people who participate in both teams.

Furthermore projects assume different communication patterns in different phases, e.g., when model x is in the hectic last few weeks before production start (last trial or mass production) a large number of small but irritating remaining problems have to be solved. Such remaining problems often are due to lack of earlier co-ordination between several partners, and they require attention by the ST managers. In such situations focus on the task and down to earth commitments to deliver on time are essential characteristics. At the same time the model x+1 project may be in a phase where crucial choices may be on the agenda which may require open minded discussions, infusion of new information, and the presence of core people in the model x team in meetings of the x+1 team. Beside the difficulties of being in two places at the same time it may be difficult to adapt to communication modes of the two teams.

There obviously is a communication problem in the conduct of product development projects in an alliance setting. The problem is rooted in the need to disentangle complexities that are inherent in project management. But it is amplified by culturally based patterns that interact under time pressure. The problem of researching these communication problems is that it is necessary to understand how different participants understand the same occurrence in the same setting, here and now. It is possible to extract intended meanings of statements by interviewing speakers in a meeting, but how do we get hold of the meanings attributed to those same statements by participants who were listening (and - still more difficult - by those who did not listen). Next we will present the method used to collect data and then some results will be discussed.

The need for new methods to support effective communication in projects.

We want to gather data on communicative accomplishments in such a way that participants can be offered opportunities to reflect on their own performance and that of others. We also want to get insights into how participants make sense of such events and what meaning emerges in participants' mind. It is not enough to analyse an event in some "general" perspective (for instance its compliance with the norms of proper behaviour of the group). We also want to be able to understand what meaning the individual participant attributes to an event. Differences in such individual meanings will be seen as roots of misunderstanding. We are interested in knowledge that may help teams to avoid unnecessary misunderstanding. It is not a matter of speaking slowly and clearly etc, but the action meaning that competent actors attribute to statements within their area of competence. Such research presupposes a considerable measure of trust in the researchers' good intentions by the participants. We carried out this field work from the beginning believing that the research process itself could be of help to the participants and planning to report back on our findings to the team at various stages. The initiative came from the researchers, top management agreed that our project was of interest, and the research site was chosen together. Observations have been carried out for about 1.5 years by video-filming meetings, questionnaire-based measurement, and extensive interviewing (some 100 interviews). The teams

developing the 1998 and 1999 model of the Volvo S/V 40 have been in focus. Feed back sessions with various audiences (chiefly the PMGs) have been videotaped as well. We have been able to observe, and participants testify to this, that our study has helped the teams communicate better.

Observation methods

1. Recording whole meetings.

In order to catch communicative events video recordings of whole meetings in the project management groups (PMG) were made. After the teams had got acquainted with the researchers through participation in early meetings videotaping of several project meetings (2 weeks interval) was started. Participants seem to forget about the camera fairly rapidly since the issues on the agenda require full attention, and colleagues will notice play-acting for the camera. The PMG meetings are decision-taking meetings - not seminars - last for 3 - 4 hours and usually have about 20 participants. Beside the project leader, the deputy project leader and the project co-ordinator (who keeps minutes on decisions), the ST managers are the core participants. There are also representatives of production, process engineering, purchasing etc. All participants seem exhausted at the end of the meetings, partly because the agenda is very compressed and partly because the room is too small to hold such a number of people for so many hours. There are planned pauses in the agenda, but time flies and the issues are so interesting that pauses sometimes are forgotten.

2. Background interviews.

Parallel with the video-taping sessions participants are interviewed individually about their own background, the purpose and main problems of the project, their experiences of how the team functions, who are the profiles of the group, what could be done to improve communication. These interviews are audiotaped and transcribed to be available in the analysis of communication.

3. Selecting sequences for self-confrontation interviews.

Six, 1-2-minute long, sequences of dialogue were selected from a focused meeting. These sequences were edited to a separate tape to be used in interviewing. We call these interviews "self-confrontation interviews" because participants are asked to reflect on their own performance and that of their colleagues in the video sequences. These interviews are conducted individually with the participants sitting in front of a TV-set where the sequences are shown one by one. For each sequence the respondent is asked an open ended question initially ("What is going on here?") and after the initial interpretation of the event the interviewer (always one of the authors) asks questions to help the respondents develop interpretations and give more background to the stated interpretation. The number of respondents in the self-confrontation interviews was c.a. 15 in both teams. The project leaders and those active in each sequence were always interviewed except one representative of the production organisation who declined participation.

Some sequences give rise to more comments than others do. The procedure of sequence selection has been that two of the researchers have seen the whole tape individually and noted possible sequences with justifications. This has usually generated about 20 candidates. Then the two researchers have cut the list down to arrive at a joint decision about which 6 sequences are suitable. This has been done for the two teams that have been studied. Obviously dialogue sequences are more interesting from a communication point of view than monologues. Problematic situations are more interesting than when communication flows undisturbed. Body language or gesturing has been the reason for some sequences.

4. Preparing for analysis.

Inputs to the analysis were, beside the familiarity with the site which the authors had gained over the research period, back ground interviews, the complete videotape of the meeting from which the sequences were taken, the transcribed sequences, and the transcribed comments given in self confrontation interviews. These comments comprised 25 - 40 pages of text per sequence. First the sequence itself was reviewed and its content as seen by an outsider summarised. Then the comments from those who participated actively in the sequence were studied carefully to find themes in explanations. Finally background interviews were scanned in search of propensities and experiences

which may cast further light on emerging themes, which most of the time deal with how people understand the same event differently also when they are perfectly rational. This gives a basis for identifying causes of misunderstandings and procedural anomalies. There are also opportunities to observe how misunderstandings are repaired in "real time".

Results.

First it should be noted that participants tended to attribute meaning in terms of a surprisingly narrow context. Granted that they were very competent professionals in their respective speciality but problems often involved more than one area and in making sense of such problems it seemed natural to find causes in power games, system incompatibilities, and stereotypes. Nobody at any time referred to the fact that the alliance is built on two partly contradictory principles ("lean production" and "customer value", figure 1). It is obviously difficult to rise above the immediate chaos and see the larger picture of different actors doing their job within differing frameworks. It seems to be good advice for project leaders to repeatedly articulate and reiterate the main strategic principles of the project and the setting in order to facilitate communication (or repair of misunderstandings).

As to the individual episodes there are some which illustrate the effects of breaching group norms (how one engineer is punished for using surprise tactics to get the project to finance an improved solution; or how one engineer is demotivated when he raises a problem which he believes relates to a strategic customer value to find that the project leader steers the discussion in a direction of another ST manager's territory). These matters of team ground rules need not concern us here.

Let us instead take the following episode which illustrates the frustrations of a relatively new ST manager who is still stationed in head quarters and tries to run his team (and relations to the production company) from a distance. The episode happens towards the end of the meeting which started 3 hours earlier when Adam reports on the status of his ST. Bert, the deputy project manager, had informed, under the information points at the beginning of the meeting that, at last, an agreement was close on the time plan for the project. Even if some details on the diesel variant were still under discussion the project could, from now on, work as if this was the set plan. There were a lot of protests about neglected effects on STs. (The time plan is dependent on try-out series in production, partly to produce test cars, partly to discover production stoppers before mass production is started. Therefore the time plan has to be negotiated with the production company to fit these tests into the very tight production schedule of the existing model. Also similar plans are negotiated at the same time with the other alliance partner.) This time it had taken an unusual amount of time since the production company did not accept the original proposal.) Before this occasion the project had worked according to its own unilaterally determined time plan - the new time plan deviated on many aspects ñ and now the ST managers would have to re-plan, in detail, every sub-project for the components to fit the new master plan. When Adam is given the floor for his presentation he starts by taking up the time plan again and Bert, tries to stop him....

Sequence 1 (971015, 12.05 - 12.06), 1999 model project meeting.

Legend:

[1...]1 denotes overlapping talk, brackets indicate beginning and end.

Text between < and > denote comments on other behaviour than speech.

Adam:

1 ... we have been discussing a lot this

2 m[1orning about....]1

Bert:

3 ...1 We can jump that question]1 I think

<pointing to an earlier point on the agenda>

4 it has already been discussed, I think.

Adam:

5 Well... I am still not happy... because <holding

6 out a sheet of paper with the new plan>. because I... I 7 think you have changed your mind since Charlie has 8 entered the room <Charlie who represents project

9 management on the production company side had

10 just entered the meeting room> ... because Charlie 11 thinks that this plan is somewhat accepted and you

12 told me earlier today that it is still under discussion. 13 The only thing I am sure about is that this one

14 <taking up the sheet of paper again> which says week 15 826 is complete rubbish <tearing the sheet apart,

16 while several colleagues chuckle > and this one that 17 says week 909 is not much better. So it remains

18 <bending forward to see something on the overhead 19 picture which is being exhibited>...[2 ventil]2...

Bert:

20 <Switching to the overhead which shows the

21 new time plan>

22 [2 This is]2.. the information we have treated today! 23 So this is what....

Adam:

24 Yeah, but do I really go out and... It will

25 come down to.... <looking at a papers if searching for 26 a figure>

Bert:

27 This is the best we think now both for NedCar

28 and for VCC.

Adam:

29 eeeh...

End of sequence

What goes on here?

In this simple little exchange Adam who is responsible for chassis and installation expresses dissatisfaction with the new timeplan in a drastically demonstrative manner by tearing up the sheet of paper. He also indicates that the (deputy) project leader says one thing to the team and another to the production company (lines 6 - 12). Both the deputy project leader and Adam are upset and the have difficulties articulating their concern. The project leader marks that the new time schedule is a compromise by stressing that it is best for both parties. Is this all?

Well we can see from the body language of the other ST managers that this protest was to the point. It expressed what everybody felt! We also know that the deputy project leader was rather new in the job and had not participated in the earlier negotiations. We also know that the ST managers push their subordinates by claiming that it is a matter of life and death too keep deliveries of solutions, drawings, and supplier commitments to the time schedule. Now they are supposed to go out and say to them that it is a matter of life and death to keep another dead line!

Comments from participants.

This short sequence was shown to participants in the meeting individually. The question was asked, "what goes on here?"

Many respondents started their comments by stating that the project "now" has a time plan that everybody is happy with (implying that the one presented at this meeting has been changed again). The project leader (who was not participating in the meeting) claims that the funny thing about the current time plan, which everybody is happy with, is that it is the one that the project set itself from the beginning. It took this long loop of negotiation with the production company to settle things. The comments are thus made against the background that this "decision" was corrected after the meeting.

A second interesting aspect of this sequence is that most respondents commented on the effectiveness of the demonstration (tearing the plan apart). One said that he has seen other members of the group take after this gesture. The gesture was loaded with meaning at this highly emotional occasion and participants now use it to express frustration (or to make a joke). One participant said: "It is to the point! I couldn't have said it better myself!" What is it that makes this demonstration effective?

One question that comes up is why the change of time schedule is so upsetting to everybody. The participants usually confirm that a set time schedule is central to a project. Changing it is not to be done without good reason. This is because a very large number of commitments are related to that plan and the meetings themselves serve as confirmation that the others are in control of their part of the deal. Consequently I will lose face if I do not show that I am in control. The pressure is on constantly. Every second week every ST manager must stand up at the PMG meeting and say that all is well or explain how problems will be rectified.

Sometimes people cheat by making unfounded claims that their part of the project is on track. It may even be seen as a refreshing audacity to see somebody bluff and get away with it because his team puts in the extra effort to catch up. But, on the other hand, it is most disturbing if others are caught out of control. It may upset everything. Therefore all ST managers are extremely sensitive to indications that the time schedule is in jeopardy. Motivational aspects and a pioneer (cowboy) community atmosphere seems to be built around the timing aspect of the project. As one participant expressed it: "The issue is whether we will have a plan that steers us or just a list of good intentions."

Another aspect to this gesture becoming an articulation of frustration is that it was effective in the sense that the plan was changed again and is now (at the time of the interview) accepted. The "point" of this sequence is that when frustration mounts and language fails a gesture can serve as an accumulator of meaning since the body language expresses what is on many participants' mind. But remember that different things may be on those peoples mind!

The next episode illustrates how a failure to respond to a signal may have motivational effects by participants taking things personally. Adam, the Properties ST manager, who is working on a general project to reduce noise (road noise, wind noise, engine noise) has discovered that at high speeds there is a wind noise problem:

Sequence 2 - 970219, 15:21- 15:23, 1998 model project meeting

Legend:

XX means unidentified speaker.

YY denotes inaudible speech

Upper case letters denote emphasis (except in abbreviations)

Adam: Properties

Bert: deputy project leader

Charles: Project leader

David: Exterior

QAC: Quality Action Center (line department responsible for quality improvement on the base car).

VCCQ: Unit in charge of collecting customer complaints and initiating design changes on that basis.

Adam <leaning forward over the table>:

1 ...the difference is due to speed, but what I did, I

2 focused… on the possibility to improve the trim.. the roof

3 trim connection to the YY....because it loosens.

<Bert first shows dissatisfaction with the explanation Adam is giving by leaning back from a leaning forward position and shifting gaze towards Charles, then in an almost continuous movement stands up and goes to the white board>

Charles:

4 That is, for me a typical refinement item [1.... ]1 to be done.

5 But wind noise has not been an item earlier... but I can ...I

6 can really... maybe on the high level but then ... that is a

7 basic...a base car problem as I see it.

Adam:

8 [1uhm]1

<Bert is writing on the white board>

Adam:

9 uhum, but my recommendation was to bring it in as an

10 item in (the xx year model project) .. wrong or right, but

11 someone has to do it.

Charles:

12 Yeah, as I said, as a refinement item .. good .. but it was not

13 something that we promised to improve in the project, but

14 can we improve it ...FINE.

<Bert finishes writing on the white board: two lines:

"General analysis -> QAC" and "Trim moulding loosening at high speed -> higher wind noise">

Bert (standing by the white board):

15 This is the way we talk about it, eh...

16 Wind noise, when it comes to a general level is an analysis

17 done by QAC.

XX :

18 wind noise?

Bert:

19 Yes, So that has nothing to do with us. But when it comes

20 to the trim moulding getting loose at high speeds ... and

21 that generates very clear a higher wind noise. This point is

22 also a VCCQ point already... in our project..

Charles:

23 Why isn't that at QAC? Are they okey today and will

24 loosen...

Bert:

25 Due to the higher speeds above 200 -220 it bends open.[2]2.. 26 it doesn't come loose completely [3]3 but it increases the

27 wind noise. Therefore David is already today working on

28 trying to fixate.. trying to fix

29 [4 the]4..

Bert:

30 [2 hm ]2

Adam:

31 [3 bends up]3

David:

32 [4 but]4.. But, as I said yesterday, not in the light of wind

33 noise! That was not the task.... (pause)..[5]5..I will just do the 34 moulding [6because wind noise is...]6

Bert:

35 [5Ha! (barely audible)]5

<body language, several people smiling>

Charles:

36 [6 ... are we starting the same discussion..]6

Bert:

37 So the task we agreed upon yesterday anyhow, eh, is that

38 we should try to fix the trim moulding better. That is part

39 of [7 98 model project. ]7 <speaking a bit louder>Hopefully it 40 will result in also an improved wind noise.

David:

41 [7 98 model project going for it]7

David:

42 Of course now I will take in that also in the task, but the

43 task itself.[8..]8

Bert:

44 [8 eeh]8 It's okey!...hehe

Charles:

45 Yeaaah, we don't want to loose that one...he he..

End of sequence

What is going on here?

What happens in this sequence is that Adam, who is a ST manager (Properties), brings up an urgent noise problem that he has discovered while driving a test car fast. The preliminary explanation is that the trim mould around the windshield and the sun roof (?) generates a stationary sound wave with a frequency that irritates the driver). He brought it up in a technical meeting the day before, a meeting where the project leader (Charles) was not present. Now, under information points in the beginning of the meeting, Adam wants this item to be formally placed within the project. He wants the authority to conduct a study of this problem and propose a solution. The problem is that action on this item is not part of the original project content. Everybody agrees that part of the explanation is the geometry of the base car because it effects the airflow around the body of the car.

The first reaction of Charles is to say that if it can be done as a "refinement" (that is without extra expenditure) fine, because the problem is a base car problem and should be dealt with in the Quality department. Bert, the deputy project leader, is prepared for this item and he points out that the high speed effects are part of the project since this project includes some powerful engines. It is already allocated to the project anyway because of the VCCQ (registers customer complaints - but if this is the case then the problem obviously belongs to earlier models and then the Quality department will have to pay from its budget). Bert also offers a solution. The problem will be solved if David's group (Exterior) can find a way to fix the trim mould better. David accepts the task, but he does not want the criterion to be noise reduction (risky criterion). He will just fix the trim mould. Adam raised the problem and the solution is given to David. Is the problem taken out of Adam's hands? Charles sees an improvement in content that will cost nothing (the quality department will pay).

An analysis of comments by participants shows that Adam is ambivalent. He indicates clearly that he is not satisfied with the way his message was received. He even indicated being demotivated "People will hesitate to bring problems up if they are not listened to." The purpose was to get a decision for the wind noise problem to become an action point that would justify more tests. Other participants indicated that there were other sources of noise, like the outside mirrors. On the other hand Adam told us in interviews

that he went on working on the problem as if he had been given the task. He conferred with the Exterior ST on what action should be taken. The test car was updated, further tests were undertaken etc. Some time after the interviews on this sequence Adam made a point of telling us that the noise problem had been solved satisfactorily.

The sequence illustrates two different attitudes towards responsibility. Adam is concerned to make a proper study to determine causes and design solutions, which is an expansionist attitude. David, on the other hand, wants to limit the task to specific actions. He does not want to take responsibility for solving the noise problem. In practice both parties work together to get things right as if the task were given as Adam intended. There is always some room in the budget.

Adam was not properly prepared when he brought up the issue. He should have agreed with David, Charles and Bert in informal conversation prior to the meeting. The problem was that Charles was not available in the short time interval between the two meetings. Several participants commented that this was an effort to bring about a decision by surprise. Bert limited the task effectively by switching from the preliminary problem definition to a likely solution without much analysis, and Charles agreed.

## Conclusions

The analysis of the 12 sequences taken from a couple of the meetings which were video-taped, and the 30 - 40 pages of participants' comments to each of them, show (1) that the project itself is the primary motivating force which makes the participants work extraordinarily hard for the duration of the project. It also shows (2) that it is difficult for participants to keep the large picture of the alliance in view during everyday meetings in the project. Instead there is a strong tendency to "take things personally", to be myopic in attributions of implications to statements. Instead of seeing the actions of a process engineer as a consequent acting out of the lean production logic it is seen as a sign that "he is out to get me". Instead of seeing late changes in the design of the car as a sign of customer value orientation it is seen as unprofessional behaviour.

One could claim that this kind of myopia is present in every project. Design and production always quarrel. We agree that this is the case but we claim that the effect is amplified by cultural differences (small as they are between Dutch carpeople and Swedish carpeople). These differences add to the complexity of the situation for the individual in the dynamic course of a project. Most complexifying (if the expression is permitted) seems to be the large number of meetings. Subordinate meetings to push solutions through, superordinate to co-ordinate and lateral meetings to inform and keep track of other parts of the project. All of it is done in everybody’s second language and inside a conglomerate of logics, which is at play at the same time. The rules of the game are different in different arenas, but effects in terms of commitments carry over from one meeting to another and from one project to another.

This phenomenon is explained by the Complexity theory (Schroder et al. 1967, Streufert, 1972, Hedberg & Jönsson 1978). When the complexity of the situation increases the capacity of an individual to integrate complexity (make sense) describes a U-curve, meaning that the capacity to integrate further complexity decreases when contextual complexity increases above the optimal.

A solution to the myopia problem in communication in co-operative product development is indicated by the effects of using the data collection method presented here. By reflecting, first individually and then in then group on communication sequences played back to participants, and by the structure an outside observer can add by analysing communication against a macro background, participants can understand the roles of each other better. It seems like a remedy should be sought in interface management. Friction between "ways of working" is made visible in the problem solving discussions in meetings. The different logics can be discerned by participants reflecting on the background to incidents like the ones demonstrated above. Interface management would mean that those interfaces between logics are formalised (forms, procedures, committees) into rules which make interfacing predictable and possible to rationalise as experience is won. In time those rules are internalised and innovative people find ways around them as urgencies drive the project towards completion. The formalisations make it possible to carry rules over from one project to another and into manuals, which can inform newcomers.

This study, above all, has demonstrated that sequences from video-filmed meetings can serve as powerful inputs to members’ reflection on the meaning of communication in complex environments. It is not just

the structure of conversation it is the meaning of problems and solutions in complex projects that is in focus.

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