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**The controller in action
- participative control here and now
in product development processes.**

**by Sten Jönsson
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Abstract

This paper analyses a video recorded exchange in a product development management group with a specific focus on the controller in action. This specimen of data serves to illustrate how larger issues of strategy and structure can be captured in the micro processes of a team. It is found that the controller seems to attend to rule making at the interface between alliance partners rather than chasing cost reductions to meet target costs. The latter task is effectively delegated to the responsible engineers through the design of the project and its time schedule. While we usually think of the controller as representing the principal or at least serve in an agency setting these findings point to a role as rule designer, i.e., as designer of the context in which cost control takes place. Action, here and now, will focus on diagnosis and maintenance of that context.

Introduction

Controlling costs, time, technology and quality is in focus in the debate on competition and lean production today (Cooper 1995). Fierce competition in some industries (cameras, cars, other consumer durables) provides for a slim “survival zone” where price, functionality, and quality have to be fixed in close proximity of what other competitors chose. Winners gain little and losers lose much. The solution when it comes to steering costs toward this zone is target costing. In a first step the company analyses the market to decide an expected sales price in the chosen market niche. From this the

desirable margin is deducted and we arrive at a allowable cost. In a second step the analysis is focused on the product and its position in the company's product line common parts etc. Then value engineering is applied on the component level, and this gives a target cost broken down to the component level. Problem solved! Hopefully there is a balance between the market deduced requirements (one could expect the market department to try to make its own task easier by requiring a low price for a luxurious car!) and the production department's interests in a design that is production friendly. Even when this balancing act is carried out with a sense of justice and the right judgement of what constitutes competitive power among cars five years from now, there remains the question how to do it. Target costing is a planning exercise. Some rationalists still believe that you think first and then you just do it, and thus rationality rules. In "real life", however, things do not always turn out as expected. That is why there are controllers!

When the next year's car model has been specified in terms of properties, target cost, and timing, a team of engineers is appointed to do the design work, release the blue prints, negotiate supplier participation, redesign tools, process investment, testing, deal with the accounting department etc. In such a year model project there will be a controller in a staff position in relation to the project leader. There will be a deputy project leader, somebody in charge of quality and a project secretary to keep track of all minutes and decisions. The main body of the project will be engineers with specialities like engine, transmission, electricity, exterior, body, testing etc. They are directly responsible for each speciality with a number of subordinated design task groups (like brakes or doors). They will make time schedules for each part in their responsibility area to meet the master plan and they report the status of their part of the project at the regular project meetings. It is not surprising that focus at such meetings is on technical solutions and keeping time schedules. The different components must progress in parallel, delays cause disorder in the whole project. Problems abound and when they turn serious they are put on the agenda as "action points". This means that a status report has to be given at the beginning of every project management meeting (every second week) until the problem declared solved. The responsible engineer is nailed to the cross of explaining delay to his colleagues until he can bring the matter to a solution.

Cost is also important! But so is safety, and quality, and the environment, and technology, and "joy of driving". The controller must be active and present in all kinds of meetings where decisions with cost effects are made. It is not much use to present a

controller's report saying that last month the consumption of engineering hours was 10 % above what was planned. The project will judge this use in relation to the job that has been done or what problems have been solved. What happened last month is not very relevant anyway because the task is to get the complete project designed and ready to go into production by the set date, and there is little meaning in discussing what happened last month. So, if the controller wants to influence the progress of the project towards targeted costs he or she had better intervene here and now in the appropriate meetings when decisions are prepared or taken. In order to be effective in such a role the controller must know what is going on and recognise when an intervention is called for. How do controllers accomplish this? Or do they bother at all? Maybe producing the relevant ex post reports according to the predetermined schedule is the only available norm to follow?

The setting

This paper has its focus on accounting talk, i.e., how a controller works with words in the product development process. Data have been gathered in the joint venture establishment set up by the Mitsubishi - Volvo alliance in Born in southern Holland. This establishment produces cars (Carisma and S/V 40) based in a joint platform for the two alliance partners. The alliance was formed in 1992 and tries to integrate Japanese lean production philosophy with Swedish customer-value-through-safety thinking. The Volvo side conducts its development of new models based in site (Mitsubishi's development is based in Japan.). This means that specialised design engineers used to a certain way of working are removed from their usual environment and located in a different and more sensitive situation. They work in the English language and are supposed to seek commonality in solutions with the Japanese partner. The fact that the production company is a separate, jointly owned, unit, means that the effects of design solutions on costs and timing in the production process have to be negotiated. Closer co-operation with suppliers in the development phase is also desirable; engineers have to travel between suppliers all over the world to co-ordinate solutions. Travel costs have to be watched.

Co-ordination of the project does not only mean negotiating agreements with suppliers, but also attending a large number of meetings where commitments of different kinds are made (e.g., business area, Executive Committee New Projects, Design review meeting, Action groups, Engine department, alliance committees of many kinds). The project leader of one of the projects drew a picture of all meetings outside the regular project management meeting which he participates in and which

restrict his freedom of action through the commitments they generate. The map contained more than 30 meetings (counting "Suppliers" as one, even though the number is large). Most binding are negotiated agreements with the alliance partner, and with representatives of the joint venture, but also the line departments of the home organisation may have very strong commitments to a certain solution due to the family concept of the cars sold under the same brand. Complexity takes the form of contradictory claims based in incompatible logics, as well as compromises, and a sense of lack of freedom to choose, in combination with responsibility.

A complication which is due to the compressed time frame for car development is that it is difficult for the organisation to learn from earlier projects, since they overlap in time. The traditional "white books" reporting experiences at the end of the project will not be of much use since two new year models are already under way when the current one finishes. Some engineers will have to work for more than one project in this era of lean organisation.

A further complication is that this is an alliance between competitors and the purpose is to produce, in a jointly owned production plant, two different cars, the Carisma and the V/S 40, on the same platform. A platform is a standard solution to many of the technical systems and components that go into a car. There are economies of scale if many parts are common, but on the other hand, if all parts were common it would be difficult to compete. Obviously the basic geometry of the two cars must be the same to fit the process, but each partner designs specific features into its car to make it attractive for the market niche it is intended for. Commonality was a priority from the beginning of the alliance, but experience shows that the proportion of common parts tends to decrease over time.

As to responsibilities it should first be noted that the production company, NedCar, is a captive organisation in the sense that its owners are also its customers. The customers sit on the board of directors meeting and push hard for cost reductions, while the owners wait at the output gate for first rate quality cars, preferably in many variants to satisfy differing market demands.

The control instrument from the owners is a business plan (and the derived budgets) that specifies volumes and costs, often with strict cost reduction

requirements. Any change in tooling or process equipment that is caused by a change in design will have to find its way into the relevant budgets of the production company and be approved at a fairly high organisational level. At the same time the responsible design engineer, captured in the target costing framework, is responsible for all costs related to a change in design, but he has to get information on process costs from another company, the NedCar. To illustrate the meaning of this for the individual engineer imagine that he is responsible for the driver's unit and wants to change the design of the steering wheel, making it "deeper" (from a flat design, like wheel, to a more cone-like design). This means that the racks that the steering wheels were placed in at the appropriate work station along the production line, can no longer accommodate 12 as before. The racks have to be replaced, rebuilt, or there must be more of them for the same volume. The cost for this is included in the cost of developing the new model. The estimate will have to be provided by Process Engineering of the production plant, and the design engineer has to make his decision on the basis of this estimate. Both parties are under strict follow-up regimes and have to get such a cost change through formal channels into their, respective, cost systems. It does not take much imagination to see the game opportunities implied here.

There is not only a difference in responsibilities, there is a major difference in logic between the two alliance partners. Volvo pursues a strategy of customer value in the chosen market niche, while Mitsubishi is a volume producer who pursues economies of scale and low cost. It is not that the partners do not agree that high price and low cost is a nice combination, but in the nitty-gritty details of everyday problem solving the lines of thought differ. Mitsubishi is inclined to think in terms of process costs and time, while Volvo tends to think more in terms of customer value. To illustrate; somebody has suggested that the customers in Japan place high value in having outside rear mirrors that can be folded in narrow passages by the driver pressing a button. The Volvo logic would be to ask how much the customer will be willing to pay for this extra property and compare that to the extra cost it will occur in design, production, logistics, service etc. if the difference is interesting there will be an added variant for Japan. The "Mitsubishi" logic will be to see the potential disturbance in production logistics that this variant will bring in addition to increased costs. The revenue side is not very relevant since production is under a cost budget. The effect of this is that good arguments have different weight with

different composition of groups. We like to describe this mix of logics between the two parties as the “strategic cross” (double meaning intended). The problem to be illuminated is how does a controller work in such an environment? How does one present arguments to be valid in two logics at the same time?

Data gathering

The study of communication and interaction where members interpret and react to arguments here and now calls for as “real” data as possible. We want to gather information of how members cope with the communication problems here and now.

The data gathering was done in and around two model year teams with special focus on the project management group (PMG) where the responsible engineers meet to make project-related decisions. Interviews with actors related to these PMGs (the 1998 and 1999 year models), as well as with the PMG members were carried out. In all about 100 interviews have been made. The main data gathering, however, has been done through the video-filming of project meetings. From the video-film of a meeting 5 – 6 sequences of 1 – 2 minutes have been edited to a separate tape. These sequences were then shown, one by one, to individual members of the group with the question “What goes on here?”. The comments were audiotaped and transcribed. For each sequence we thus have 15 or more comments, usually dealing with background to the issue at hand and interpretations of the implications of actor behaviour. The confrontations with the video sequences were done about 3 months after the meeting in question. Many meetings have been filmed. The analysis here will start with one sequence and then use other excerpts from tapes that illustrate “live” controller behaviour.

Background to the sequence

The situation of the sequence below is that Al, the managing engineer for Chassi and Installation, is reporting on the status of his area of responsibility. The meeting has gone on for 2.5 hours. Bob, who represents the function in NedCar that steers new models into the production system, usually does not have time to attend whole meetings. Now he is present and Al takes the opportunity to bring up a problem that he was made painfully aware of in a recent Cost Review Meeting (CRM). In

the CRM the status of the project in relation to target costs and project budgets are followed up. Each responsible engineer is called upon to respond to cost performance in relation to targets. Al, is responsible for all costs due to design changes, including investment in tools and process. In the recent CRM new cost estimates from process (made by cost engineering in the NedCar organisation) were presented to him for the first time. Al could not answer and since then he has investigated and found that the information on these costs in production process has not been given to him. In Volvo it is a strict rule that the managing engineer (for, e.g., Chassi) is responsible for all costs, without exception due to design changes. He has a contract with the project leader and the rest of the hierarchy to deliver the specified Chassi-content of the project in time and inside budget. At the CRM new cost estimates were presented for him to explain. The crucial documents are the PECs (Product Engineering Change) and their attached “Yellow forms”, that specify investment consequences of design changes. The sum of such “yellow form” investments goes into the NedCar budget as addition to the “Business Plan” that is based on the original project content. Since Volvo has caused the extra investment by changing the design Volvo has to authorise the change in the investment budget before NedCar can start to spend the money.

From the NedCar perspective Production is under strong pressure from its owners (Volvo Car and Mitsubishi Motor) to apply lean production. The budget for investment in production facilities and tools has been trimmed to the limit in order to minimise costs per car at the given volume and mix agreed in the basic plan. Should the owners change design or add features (like introducing an extra colour option) the investment effects of this will have to be covered by the organisation that initiated the change. Suffice it to say that changes offer an extra opportunity for Production to buffer its budget, e.g., by arguing that the change in question will cause a change in the schedule for the Paint Shop and there will be extra costs etc., etc..

The managing engineers for the different functional areas want to know cost effects before they decide about a certain solution. The natural thing to do is to ask the appropriate department at NedCar to estimate whether there are any final assembly effects of the proposed change (which may be more or less specified in Design Concept Sheets when the first question is posed). The problem is that the NedCar

department wants a clearly specified question, while the project does not want to use a large amount of engineering hours before they have a feeling for whether the contemplated change is feasible. Thus the questions to NedCar often are based on incomplete specifications and answers, consequently, will be only preliminary. When the project has decided to carry out the change a PEC and the accompanying “Yellow Form” is issued with a more definite estimate of the process investment consequences. All these investment consequences (yellow forms) will be checked by the controller and then confirmed by the Volvo representative in the Board of Directors of NedCar and added to the NedCar budget.

The work units subordinated to the responsible engineer, who is a SU manager, are called KUs. Activity teams are the groups that are formed with members from NedCar and the project to discuss consequences of design changes in the production process. PECs are the Product Engineering Changes which are released when a design change has been decided.

The sequence (AI expresses distrust in cost estimates).

PMG-meeting, 1999 year model, 1997-10-29, 11.38

Participants:

AI: SU manager, Chassi and Installation

Bob: Chief of the Project Management department at NedCar

Charles: SU manager, Body

David: the project leader

Eric: SU manager, Electricity

Fred: representing Product Planning (marketing side)

George: Project controller

- Start of sequence -

AI: .. during the CRMs we had the cost engineering guys from NedCar here coming in saying that this is going to cost you this and this is going to cost you that and my KUs and myself have not heard about these costs ... and while you are here Bob... I sent you a memo on this .. <lower voice> I don't know whether you agree...but I don't know where all these costs come from... we can't find them in

PECs we can't find any memos and some of them have not even been discussed properly in activity teams.

<Charles is trying to break in>

Bob: Costs come from the basic plan and from issues..... yeah I suppose now they are updated... and in those... that document you find the investments

David: But aren't it normal that you have it also in PECs?

Bob: Initially that is not needed!

Erik: But if the investment is dependent upon the technical design that we do? But if you don't get the feedback that this will cost you that much!?

Bob: But, listen! We have sheets for design... design concept sheets. That is correct so we know the design. We report than in the cost integrated plan (?) So you can discuss with these departments about the cost of course.. no problem.. if you are okay on that then you know that this will be the cost for this project. If you change the design then you have a problem!

Fred (?): Then you will see it on the PECs

Eric: I had the same experience as Al! The first time I saw these costs was when I got a thick booklet <showing with the fingers how thick a pile of paper it was> .. and when I read it through it said "investment in final assembly"! I never heard of it! It had never been reported to me nor my KUs! It is not implemented in yellow forms, I don't have a budget for it! I don't know what it is!

Bob: I don't report to KUs not even to SUs

Eric: Then it is not my problem, because I don't take the cost!

George: But Bob! If we do not have corresponding figures between the sum of the yellow sheets and the basic plan we cannot sign the basic plan. We don't have those

costs in the PECs, therefore we do not have them in the yellow sheets. So we need to have the PECs updated, and the costs splitted up per KU!

Bob: No need. There is no need to have that additional investment on the PECs

George: Yes

Bob: Why?

George: Because we need to penetrate those costs as well as all other costs per KU and it is the SUs responsibility to say if these figures are correct or not. The basic plan is just the sum of all costs and when that sum fits with the sum of our yellow forms then the basic plan is okay. If it is not the same sum then it is not okay!

- End of sequence -

What goes on here?

Al complains that in the cost review meetings cost engineers from NedCar has presented investment costs in final assembly due to product changes which have not been heard of before and which have not been recorded in the appropriate documents. It seems like NedCar is sending bills which have not been agreed. Bob explains that the costs are recorded in the basic plan. If you change the design then you have problems! There is a discussion of how effects of design changes are recorded in the documents. Territory is invoked; Erik saying that if cost are not reported to (ex ante) him he will not accept them (ex post), Bob says that he does not report to SUs or KUs. George intervenes by explaining the rules of the game between Volvo and NedCar on this issue. Bob maintains that it is not necessary to report investment cost on the PECs. George reiterates that it is, because before accepting the increase in the process investment budget Volvo will check “yellow form” figures against the lump sum requested by Bob’s department; the final word rests with Volvo.

This is a case of crossing of responsibilities which was highlighted in a recent CRM. Responsible SU managers must have the estimates as a basis for decisions on design changes (and they want them early, before much engineering work has been spent!). Bob does not recognise the matrix situation and argues from the simpler hierarchical position (implying that one way to avoid these extra costs is not to change designs!). George's argument is that there is a procedure that must be followed.

Comments by participants.

Speakers

Al, a British national, is glad he was the one that brought up the issue. Colleagues, who had brought it up, recognised the problem and supported him. Al points out that Bob, obviously, does not understand how Volvo is running the project, and that the different design areas are responsible for the costs they cause by design changes. Bob had said the same thing before the meeting when Al had brought the matter up face-to-face with him. The problem was not solved at the meeting and it is still not clear whether it will ever be solved.

Al gives example to illustrate how tool and assembly investment costs must enter into consideration before design changes are decided, and how frustrating it is to have squeezed the design inside the budget and then find out that there are surprise figures from Final Assembly when it is too late to do anything about it (and on top of that have Volvo headquarters' wrath for not being able to keep within the budget.)

Most of the time these surprises do not amount to very much money, but where will it end? This is the affect driver and Al is the one who brought the issue up.

David, the project leader, sees this as an illustration to how ways of working are confronted. The established Volvo way is that the SU managers are strictly responsible across functions. All costs related to a contemplated design change must be accounted for in one report. You must see the whole picture, not bits and pieces. The problem is that NedCar responds to design change proposals in two ways. The (production) process consequences are described first via the Design Concept Sheet and then via the PEC. The PEC is the final technical solution which

announces that a Change Order will be released. This is a more worked through document that can be trusted, while the Design Concept Sheet is just a tentative design. An estimate based on that document will also be tentative. NedCar has a very competent Cost Engineering department, but it only works on the basis of PECs (not on the Design Concept Sheets). They use the PEC when their purchasing engineers discuss with suppliers etc. to find the best solution. As a consequence the project gets the cost estimates based on the PECs only in the CRMs, while the project engineers may have more tentative figures based on the Design Concept Sheets.

David also explains that changes to the investment figures in the Basic Plan of NedCar require board meeting decisions, and that Volvo's controller checks the figures before Volvo confirms the part of the budget changes that relate to design changes. When the figures from the Design Concept Sheets are compared to the PEC figures there will be a deviation, and this is a reason for correcting the NedCar budget. But it must also be possible to trace the deviations to the individual responsibility areas in the project. The problem is that there is a "grey area" between the Design Concept Sheet and the PEC. If there are several changes under ways, when does a Design Concept Sheet become a PEC? David (originally a production man) is of the opinion that there is not enough understanding among the project engineers and the production people at NedCar. After all there is a common aim to make NedCar an effective production organisation, and that calls for technical solutions that are process oriented, without losing the customer value properties. There should be harmony between the stand Volvo takes as shareholder in the production company and as design project manager.

George, the controller, starts out by giving the background to this discussion. It is in the Cost Review Meetings that project costs are followed up, component by component, S U by S U. George is there, the accountant serving the particular SU, Cost Engineering and the Costing Group (working with tool costs and product costs) are also represented. The Cost Review means that the reports from Cost Engineering and the Costing Group with the opinions of the SU managers based in their data. It turns out that for almost every SU the yellow sheets were not properly updated. The yellow sheets are there from the start, based on the Design Concept

Sheets, and they are supposed to be refined as you go along. Since they are not design engineers do not have the full cost picture when they even if they are responsible, and they are surprised in the CRMs. They are agitated in this meeting and ask for David's support. Obviously they must know all costs in order to be able to assume responsibility.

Now, Bob says (for NedCar) that they have summarised all costs in the basic plan, which is a NedCar document containing their offer to the board. The expenditure is justified by added processing value etc. and he thinks that is all what is needed to get the investment budget decision in the NedCar board. George doesn't think so.

The matter has not been solved yet. The project has asked Bob or somebody from his department to be present at our CRMs and explain their cost figures. They will probably comply but not during the life time of this project. The reason for this "optimism" is that NedCar themselves have complained that the Volvo design engineers are not paying enough attention to the production effects of their design changes. Given this complaint it is only reasonable to accept that a prerequisite for such attention is that the design engineers are provided with the proper information.

George goes on to comment on the great difference in ways of working between NedCar and the project. He has done a gigantic job to try to reconcile the figures from the yellow forms with component costs and with the proposed Basic Plan. David, the project leader, has to sign the Basic Plan before it is presented to the NedCar board. For them the important document is the Basic Plan, for the project it is the yellow forms. He has not signed the plan and the production department has not come up with the required details, "and there we stand". Probably they are too short on staff, but there is also disagreement about the relations between NedCar and Volvo inside the NedCar organisation. The Cost Group wants to clear out this mess, but it seems like Bob wants to run it his way. However it seems like Bob has got an assistant (with experience from Gent and Gothenburg) who will deal with the project now and he is much more flexible. The interface will be smoother but we do not know about the willingness of the core of NedCar to be more forthcoming on adapting procedures to "real" problems. George, the controller, is largely focused on procedures, and the need to reconcile figures. This seems to be the reason why his comments deal exclusively with procedures and the discipline necessary for them to work.

Eric, a fairly newly appointed SU manager, says “Well, this is not really about costs but about ways of working.” There is no set procedure for dealing with how design engineer can get the necessary information from Production. It is not only cost figures, it is also how a design change will effect assembly time. A saving of assembly time might justify the investment in process. Now he has to work without reliable information, and George has to put a lot of work into splitting up the lump sum reported by NedCar on SUs and KUs. Eric illustrates with stories and also points out that in fact Bob does not know the realities of the problem. He bases his comments on some ideal model (which does not have a real life correspondence). In real life there must be direct contact between many engineers on both side. Using the project leader and Bob as window persons generates a bottle neck. All this illustrates that we do not understand fully how it works down there (inside NedCar) and they do not see how we work. Eric also comments on how it has become more and more important to know exactly for which project you are working and who is paying. If it is a quality problem the Quality department may be willing to finance. If the solution may be introduced as a “running change” matters will be different. There are always several different projects under way and the same engineer may be engaged in several projects. You have to know the cost in detail related to our responsibility.

Eric’s comments illustrates how more complex the responsibility of the SU engineer is now when there is a continuous flow of new year model project, intermixed with running changes and quality improvement projects. Often the same engineers are involved in several projects at the same time.

We have not been able to obtain comments from Bob on this sequence.

Non-speakers

The comments by participants who did not take part in this particular exchange confirm the general opinion that there is a procedural gap between the two organisations. Some comments indicate suspicion that some costs are covered up. The deputy project leader points out that the problem is discovered only when you

discover the lack of information through the CRM surprises. Until then you believe that the yellow form figures are the real figures, because this is how it is in the Volvo way of working. It seems like there is a better grip on supplier costs than on NedCar final assembly costs at present. We have to work on this. You see the value of detailed information when it is missing.

Other commentators give more wide ranging views. A Dutch engineer, working in the project, pointed out that the basic plan contains an investment column with lump sum figures. It is difficult to understand why the NedCar people do not communicate on the SU level since they have the figures. The conclusion must be that the forum for this communication, the activity teams (where design, process, and purchasing engineers sit down to discuss PEC issues and work out consequences) do not function properly. (This was the only comment to this effect!). This informant proposes the theory that Bob wants to establish a rule which says that activity teams may only be set up when NedCar approves – implying that NedCar has determined the process costs based on Design Concept Sheets – while the Volvo way of working requires a continuous dialogue until a solution that satisfies all parties has been found. This, however, would require delegation of authority for lower level people to commit NedCar to solutions they cannot guarantee since they are controlled by an investment budget decided at the very top. NedCar does not like such a floating situation, but the whole idea with a project is to find good design solutions to the preliminary design sketches shown in the Design Concept Sheets! Some components will be carried over from last year's model, but several hundred will be changed. Until this impasse is solved NedCar is likely to resist design changes that effect their investment budget. The explanation is that the activity teams have not been implemented properly.

A more experienced engineer blames the differences in ways of working. NedCar tends to work in a “relay” fashion. First you decide what you want and then you calculate the cost. Volvo needs cost estimates much earlier. In his area they have set up a short circuit in that they have engaged some people from NedCar in regular meetings every second week to work out agreements on issues like this one. Al and Eric are newcomers who do not know their way around down here yet. That is why they were surprised at the CRM. Still Bob is to blame that the formal rules do not work (i.e., that yellow forms are up-dated). This can be compensated by keeping close relations to Purchasing to keep informed. You have to work informally.

The SU manager for Technical Documentation informs that this procedure has been in force since last year's model and the logic of it requires that the yellow forms is the primary data source for cost reports and the basic plan. There is work under way but the next year model project will no doubt stumble into the same problematic before it is solved. The method in working out routines has been to solve problem by problem as they arise. But there is power politics involved, if NedCar find that they do not have a say in procedural matters they might just turn stubborn. Bob is the embodiment of this approach to discussions, others are more accommodating.

Another team member points out that since NedCar is carrying out the investment and since their costing department has the correct figures they should have the final say on process costs. The thought model is that Volvo places an order and NedCar calculates the price. Negotiations could be carried out in the activity teams.

The engineer in charge of testing is not concerned by the problems dealt with in this sequence but he recognises similar yellow form problems when he orders special tests to be performed by the Testing department in Gothenburg. But he never has the problems indicated here. You order a test, they give the cost for it, this is entered on the yellow form and given to the Controller, and that is the end to it. No problem. (Because the test is ordered irrespective of costs?)

One respondent provides information on other projects to co-ordinate information. A new manual describing the procedure to develop an existing car (DEC process) is under way. There is work under way to solve problems that relate to the differences in computer systems where Volvo, NedCar and Mitsubishi specify their cars respectively.

The engineer representing the market side (Product Planning) had not thought much about the problem until the video sequence was shown, but he was able to construct an understanding of the problem by tracing how the routine usually is; Normally an engineer who is contemplating a design change will do a desk study to investigate whether the idea is technically feasible before NedCar is approached. Of course process consequences should be included then. It would be nice if NedCar could

respond to informal questions (like, 'I am thinking about this change, do you see any problems with that?'), but NedCar only responds to complete, well specified study requests (i.e., PECs) so you have to go on without the requested information. Sometimes an engineer will bring up a question in the PMG meeting whether he should do a desk study on a possible technical solution in order to be on the safe side, but then Bob will attack on the basis that this study has not been presented to NedCar and one should not go ahead before the process consequences are better estimated. In order to be able to specify a study request you have to be pretty sure about what you want to do and you don't know until you have the answer from NedCar! Since Bob is a bit grumpy on this people sometimes hesitate to contact him in early stages and get out of this impasse by presenting studies exclusive of process costs. Co-operation with NedCar is not full teamwork yet.

One SU manager was very upset in his comments on the sequence. He had just got a (delayed) report showing that process costs would amount to an amount that was larger than the entire design task budget for the job, and it was just a lump sum. When he asked for a specification he got a fax – in Dutch. There is a meeting later today to sort things out. You really have to be very active to get proper estimates of process costs; the engineers in NedCar are fairly easy to deal with but their boss is very protective of his plan and cost estimates. He makes it more difficult to deal directly with them. It would be nice to have some Volvo people employed in the NedCar organisation to help us get around in NedCar (like Mitsubishi has).

Analysis

The problem in this situation is that two organisations with different structures of responsibility are confronted. The production organisation has a hierarchical and functional structure, while the project has a task oriented structure. The project engineers need information broken down to the component level, while the production organisation needs the information by department. The lump sum budget is rational for the production department. If it can achieve the desired effects by combining different changes so as to save some expenditure there will be a

buffer left over in the budget that can be used in other improvements. This custom NedCar has taken over from Mitsubishi.

Formally the production organisation has no obligation to report to these individual engineers. There is an agreed procedure (based on Volvo's "yellow forms") but it does not yet work in practice. One of the reasons for the problem is that the project need the information early, before they have put too much engineering, while the production organisation does not want to study details and engage suppliers until the design is reasonably final. Another reason is that newcomers have not yet learned how to navigate the informal channels in the alliance and have to rely on formal procedures (or they might not yet have learned which these procedures are). They may know that the official policy of Volvo is to make the product development process more similar to the corresponding processes in Volvo proper. As a consequence the engineers who are new to the alliance environment behave as if the genuine Volvo procedures are in operation, when they in fact are not. In sum it can be said that the procedures, processes and responsibilities are in transition. The hope is that when things have settled down, the process will be normal. A more reasonable expectation is that things will never be normal. Flux is the normal situation in an alliance.

The controller tries to stabilise "things" by institutionalising the rules of the game. This situation opens up an opportunity to explain (repeat) the rules and the controller takes it. This time he grounds arguments in the power structure. Only if the yellow form figures add up to the lump sum requested by NedCar Volvo will release the funds. This is a compelling argument in facing up Bob, who is a hierarchical man.

Bob sees himself as reporting to the top of his organisation, not to a more or less anarchistic flock of engineers. George could have scolded the individual engineers for not seeing to it that they have the updated investment figure in their yellow form (more experienced colleagues told us about how one can keep one's figures updated), but he chooses to argue in support of the project claims. (There will be other opportunities to remind engineers that they should be alert to update their figures.)

Such an opportunity is the CRM, the cost review meeting, which is designed to check how well the project is likely to meet its component target costs. It was at such a CRM that recently that the debating engineers had been surprised by latest figures had been provided through formal channels department to department. Newcomers, who are not familiar with the informal channels tend to trust the procedural manual and not updated forms. They were shamed before the cost review committee because they did not know their cost. Al took the initiative (and the risk) to bring the issue up in the project management meeting. He was pleased that he had brought the issue up and gained support from fellow engineers that this was a problem. It should be noted that the more experienced engineers did not say much here. (No doubt hints will be given privately about how to get around it).

This sequence reminds us that there is continuous work on the formalisation of procedures. At the time a committee was working on a new version of the overall procedure for developing year models of an existing car. There was also a work party on smoothing communication between Volvo and NedCar. These projects were “inspired” by the experience of the last project (1998 model) that was just finished.

Contemplating the role of the controller it seems like it is to help the project anchor its processes in the existing set of rules and to initiate rule making when needed. It seems to be to uphold the rules of the game while being an inside team member at the same time.

Having discovered this preliminary role we have searched a large number of videotapes from meetings to see what else the controller does. Was this an exceptional occasion or is the controller in action oriented towards making the rules visible rather than pursuing the individual cost overdraft?

The first observation is that the next meeting in the project management group had an item under the heading “Job Follow-ups”, the part of the agenda where the status of specific tasks are reported and declared closed when the problem is solved. When the problem is not solved the decision is “Still open”, and it appears on the next agenda. The item heading stated; process investment consequences of design

changes should be reported through proper channels with “proper channels” highlighted. Arriving at this point on the agenda the project leader (controller absent) stated that information on the procedural aspects as seen by NedCar were available and a meeting between the controller and representatives of NedCar is scheduled. Then the controller will “tell us how to handle it”. It is obvious that the opportunity to settle a procedural mis-match had been grasped and the controller was at work, but there was no further discussion in the project meeting. Also in other project meetings we found the controller to be fairly non-aggressive in his action. Most initiatives were taken to assure that rules are understood and followed. The cost pressure came from the project leader.

Second, the controller has been observed in one Cost Review Meeting (CRM) (the 1.5 day meeting AI referred to in his original complaint). The role of the “inquisition” was conducted by representatives of the Cost Engineering department at Headquarters, with the controller, if anything, supporting the local engineers in defending their remaining overruns.

Thus this review only confirmed that the controller seems to have his focus somewhere else than in controlling costs. We believe it has been on diplomacy at the border between organisations. Looking closer at the interactions between the design project and the production company we could detect two types of interaction; interface management and interpenetration. The latter kind is when members of one organisation enters the other organisation in search for information or commitment. This is always on specific, concrete issues and is usually done informally and often “illegally”. The former is when interaction takes place at the border and in a formal sense. The matters are “of principle” and deal with rules of the game. Diplomacy, as it were, the output of which is formalisations (new forms, procedures, committees etc.).

Managing at the interface

The “interpenetration” activities are usually driven by a specific task (e.g., engineer X is considering a re-design of the steering wheel and wants to know from Process Engineering if this design change will cause any costs due to new investment in tools or process equipment). It is relatively easy to find the counterpart in the other organisation with the relevant information. The problem might be to extract a firm

commitment. The process engineer probably does not have the right to commit his/her organisation, the matter must go through “proper channels” for that, but an honest estimate from somebody who is trusted may serve well enough in the design process. Experienced actors have organised regular, informal meetings to keep strategic counterparts in the other organisation well informed about what is going on in the project and in return meets a willingness to help. This way they achieve a flexibility to circumvent all kinds of formal blockages, elegantly and in a seemingly effortless way. The common task is the lode star.

Interface activities involve territorial rights.

It is ‘natural’ to assume that a production organisation needs a hierarchical structure since the core activity is co-ordination material flows and adaptation of capacities to this flow (inside a limited budget). Co-ordination problems will be moved upwards for solution and it is a requirement that every move inside the responsibility area be under unitary control.

The project organisation also is under a strict discipline, but of a different kind. Creative solutions to design problems are wanted, but the task is very well specified in advance and restricted in time and cost. Problem solving goes on in parallel but it is a good strategy to keep informed about what the others are doing. Therefore there are meetings, documentation in protocols and their appendices, and registration of design changes in data bases. The individual actor earns his/her freedom to pursue the task by keeping the others informed and by demonstrating competence. This generates a strong discipline in the project.

When the two types of discipline are confronted there might be friction since the felt urgency to find rules of the games that will allow both territories to maintain control is generated from sources of different kind. Typically the project wants to avoid delay while the production organisation wants to avoid costs. They both want to avoid loss of discipline. Therefore the matter has to be dealt with at the interface, and probably in a fragmented fashion; problem by problem. A work party with representatives will be set up to solve the problem and anchor the solution. The outcome will be formalisations, a new form, a procedure, a co-ordinating committee.

There is an initial contract, but unexpected events will occur and additions will be made. This means that “manuals” have to be up-dated, which in turn requires work parties etc. Process Engineering is responsible to adapt the production process to incoming new models. Personnel is a scarce resource in a lean production regime. The department head will become the natural “window person” through which inquiries are channelled. He needs a matching window person to deal with issues that are not strictly technical (like investment costs, and procedures). It is through agreements on these that the specifics of the joint venture are worked out. Traditionally the role of the accountant has been seen to be a technical expert positioned between principal and agent (Ijiri 1975). In this case we see another role close to the interface between alliance partners, not serving the hierarchical structure as much as the horizontal efforts of creating win-win situations.

Conclusion:

This incident in the flow of incidents that makes up a product development project serves to illustrate how the “business controller” role may shift in a alliance setting. Instead of representing the principal in pursuit of compliance with plans, the controller may serve efficiency better by working at the interface between alliance partners. Discipline is strong on both sides although they stem from different urgencies. Rule making at the interface might be the best way to serve both customer value (differentiation) and cost leadership at the same time.

References:

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