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**Budget-variances and circulating accountability: Mobilising the budget in a  
construction project**

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This paper is concerned with an unfavourable budget variance of almost 30%. The budget variance is a simple mathematical achievement: It is the difference between a budget and realised results in cost, revenues, profits or spending. It requires an initial budget sum and a later accounting statement.<sup>1</sup> The 30% is a spending variance. There is time between these two propositions, and something happens here. What explains a variance and what does a variance explain (Ansari, 1979)?

There are numerous discussions of negative budget-variances in construction projects which are often explained by politics or optimism. Politics suggests that people knowingly misrepresent the true cost of the project at the outset and the resulting variance is the effect of this distortion. This is a likely aspect of the game of budgeting. Optimism proposes that people at the outset set aside previous negative experiences because they have learned their lessons and therefore the future is positive. This psychological trick is, however, in vain and there will always be new surprises not previously encountered in history. Learning is fragile. Both explanations are reasonable. However, both explanations tend to pay more attention to the inputs and the outputs than to the process that connects the inputs and outputs. Therefore, it is useful to ask two further questions. One is how the variance materialises itself? And the second is how do we know whom to blame for the variance?

There is thus a need for research which studies how actors mobilise the budget-sum during the process of building the construction (see also Tryggestad, 2007). This paper provides an account of the fate of a budget in its translations into the construction – in casu a building; the Animal House. It details how construction activities are decided and focuses on the development of items that are associated with variance. We participated in construction meetings several times per week for several months and conducted interviews with participants of the process in order to develop an understanding of how the budget-sum was allocated to the tasks involved in building the house.

We understand this process as accountability, the production of justification and excuse, through which results are judged as appropriate or inappropriate (see Munro & Mouritsen,

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<sup>1</sup> In this particular case, the building is not yet quite finished and therefore, there may be future changes to the 30%. Our story is about the development of the 30%.

1996 for variations hereof). It attaches responsibility to results and allocates blame and praise. In this endeavour, however, accountability separates integrated activities. It makes divisions and distinction in matters that present themselves as connected wholes and thus creates a tension between the collective of the building and the individuality of responsibility.

Our analysis suggests a dynamic accountability setting. Accountability is not only a structural game either hierarchically or laterally; nor is it only about identity as a failure or as a success; and nor is it solely about the discourse of results and responsibility. Animal House also tells us that the budget variance is more than testing for accountability at one point in time after the accounts have been drawn up. In contrast we suggest that accountability circulates between actors and it only stops with one actor for a while and then it moves on across time and space. At a certain point in time a certain actor may be pointed to as the cause of the concerns facing the building but this accountability pressure also eases again because the concerns of the collective building take over.

### *Approach*

The study is longitudinal. The empirical object in the paper is the construction phase in a period of 1½ year, from an empty construction site until the topping out ceremony. We *observed* 4 different types of meetings during the period: project meetings, project status meetings, economic settlement meetings, and design follow up meetings. These observations have been supplemented by tours of the construction site with architects, constructors and client. We also interviewed all participants engaged in allocating the budget. Last, all minutes, books and tables used in the project setting were open to us and we received an email every time a document had been uploaded on the project intranet.

## **The Construction of Variance around Animal House**

The empirical evidence is here organised in four steps which allows us gradually to build the concept of variance. We start by some examples of production of variance, and then we proceed by analysing the longitudinal aspects of the production of variance and suggest how multiple propositions of variance build up simultaneously. We then suggest a form of resolution whereby a

series of variances are settled at least for a while. This leads to our discussion of how accountability pressures work dynamically.

### *Constructions of variance*

We followed the project to build Animal House for a period of a year after the budget was set. During this period of time, the construction site was transformed from grass and mud to a building with a roof and an rough outside savannah area. It was not difficult to see that the Animal House grew but the work to make the building concrete was less a linear process than the building testifies. While, clearly, the building started from the bottom and moved upwards, the work to develop it was a constant test of new propositions of its possible existences.

The building was realised not only by brick, mortar and concrete. It also required sketches, drawings, visualisations and calculations. Even if budgeting and design were finished, they were not over. Many design choices still remained, and new calculations of quantity, cost, and strength had to be made. Design choices and calculations were related and often these were interwoven with discussions and negotiations since each party would bring its separate calculations to the table.

Design activities and the contract form. The design and budget for Animal House were proposed before tendering commenced. This pre-tender budget was lean since much time was spent to incorporate designs changes that would allow the building to progress within budget (for an account, see Mouritsen & Bekke, 2007). The tenders assumed that designs choices could and should still be made after main contractor was found so that additional knowledge about construction could benefit the project. The idea was that Animal House was in need of all the knowledge that could be mustered:

“We were advised to invite proposals based on early tender, and it should give us the possibility to optimize the project among the consultants, client, and contractor by working on finalizing the project together. To prevent the possibility of having detailed things that were not so easy to build according to the contractor, and therefore we should incorporate their ideas in the project as well.” (Client p.1)

Design and construction were related but this created uncertainty about the roles and contributions of the parties. Time was an issue and as a result, the first time was waiting time, waiting for drawings from the architects and consulting engineers.

“They (the contractor) claim that they have been rejected by the consultants at a very early state of the project, because the consultants didn't think that there was time for dialogue. They preferred to focus on finalizing the drawings. ... This has been the reason why we know are facing these problems on the project and that we still deep in the construction process are concerned with clarification of things.” (Client p1)

How does a finished drawing look? When is it finished? And what is dialogue? Who can say something and insist on being heard? Surely such questions challenged deadlines which could have been bearable if it did not also hamper the deployment of men who were waiting to start.

Between design and construction. Architect drawings were the beginning of a series of other drawings and calculations. They instructed consultants to test strength, and together the drawing and the test of strength required the constructor to develop their own work drawings, which they used as a plan to allocate activities across time and space on the construction site. In these translations, there was discussion, clarification, re-drawing, re-calculation and re-allocation of activities, and this negotiation built on distinct assumptions about the roles of participants. This was singled out as an institutional trait given to cooperation across the countries from which participants came. Architects were used to projects with early tender which would invite the contractor to have a say in the final design suggesting advantages of keeping design issues open so that new ideas could be drawn in late in the process. Architects would prefer to postpone decisions on choice of materials until the range of possible choices had been made clear as late as possible:

“I think the architects in [country 1] are more used to cooperate with the contractor in a complete different way than in this country. Here the architect writes that he wants a door, in [country 1] a door is described, in relation to its size, how big it is, where it should be placed, and then the contractor will present a range of possible choices to the architect, and then he will pick the one he likes the best.” (contractor, p. 26)

There was uncertainty about the roles to be played which translated into concerns about who was expected to propose design choices and when to settle the design:

“The architects sometimes draw something that I first find out later when he wants to change details. There can be some discussions about differences in adding a wood surface onto the ports and the walls. Yes it is a long discussion, and lot of time has been spend already, also for the contractor who has been finding prices for a lot of things, that end up not being used anyway. Because the consequence is that a lot of things will have to be changed and it will be very expensive to change, it would have been a different story if the architect had been suggesting this in the beginning, instead of now.” (Client p. 8)

It was unbearable to the Contractor that architectural drawings did not specify enough to be credible inputs to the development of the work drawing in time. The Contractor attempted a short-cut by working according to consulting engineers’ drawings instead. This, after all, would allow the process to go on. But such a short-cut was uncertain. Not only the Contractor but also the Consulting Engineers engaged discussions about the status of drawings at many points in time because what was claimed to be unfinished drawings would quickly translate into costs of uncertainty. Such cost could only increase because it took time, effort and frustration to negotiate premises:

“Contractor: We need a new price for this; it does not work otherwise.

Consultant: But [another Consultant] says that it is explained in the detailed plans.

Client: Is this an architect or engineering project?

Contractor: Both.

Client: No, it must be written in the documents somewhere.

Contractor: We have given our price based on [these assumptions] and we want to trust the engineering project. We cannot build based on the architect’s drawings. Therefore we have made our work drawings based on the engineering drawings.

Client: We need a neutral person to solve this issue.

Contractor: It would be different if there was a change in the project.

Client: Who is responsible for this work?

Consultant: [Reading aloud from the contract]: ”Contractor has responsibility for the separation between [a] and [b]”.

Client: Is it inside the construction site?

Consultant: Yes

Contractor: No, the responsibility lies with The Nature and Forest Agency. It is theirs’ already. They have placed permanent trees in the area.

Client: But it is not finished yet. So far the ground-water and the other things are not in place.

Contractor: (takes a deep breath and exhales loudly).”

(Project status meeting, September 2007)

The discussion of drawings moved responsibilities around. Who could and should do what? Who had already done something? Who could expect to be reimbursed from the situation? How much detail should be counted on? Would the precisions of an engineering project be a hindrance to the progress of an expressive architectural project? What type of detail mattered?

The Contractor attempted to fix plans and contracts with their subcontractors early in the process. This was standard operating procedure. Such a procedure fit well with an engineering project but badly with an architectural project. For example, what appeared to be a small issue changing the seats in the visitors' area from leather seat to wood cover, turned out to be unexpectedly complex. The change was motivated by the Client's change of interest towards long term maintenance and a possible price reduction:

“Interviewer: Now, the Client wants to save money by changing the leather seats to wooden seats, right?”

Contractor: Yes, they try different things, but I'm not sure there is a big price reduction in that. It is a nice piece of leather seat, but there is no difficulties in sewing leather in a curved form. But wood is far more difficult to curve like that; it is not just a piece of wood; it is a big job to get the curves right. And I know if they end up choosing mahogany wood the Architect will definitely not accept a choice of inferior wood quality.” (Contractor, p. 14)

How wide-ranging were the consequences of a design change? The little, neatly packaged decision to change materials, suddenly moved in many directions. Is less expensive raw material more expensive than expensive raw material? One lingering issue was whether the change would involve labour costs as well? The decision was to go for the wooden seats and the Contractor negotiated the price with a carpenter offering more work in other areas, i.e. to develop a package deal, to make price reductions acceptable. The price reduction targets did not fare well with the carpenter who returned by offering a choice between two suggestions. One suggestion was a price discount on the seats, *if* the order were combined with supply of thin wood doors. The second suggestion was the original price of the seats and supply of thick wood doors with no discount. But the client wanted the thick wood doors and seats with a price discount, which was not offered. The concern with the surface of seats multiplied. Design changes added new design choices that allowed new economic possibilities to come forward. Wooden chairs were problematised by leather chairs, but suddenly the chair came to be a discussion about thickness of doors because the concern to get a discount

overrode the concern to develop what could be a long term solution with a more agreeable expression.

Also, the example illustrates that a change proposition per se required time and effort as it made actors perform new tasks:

“Changes cost money and it almost makes no difference what it is, whether you take something out of the project or put it into the project, then it is additional cost. Imagine, we have a carpenter to calculate on some changes. Every time he gets something on his table, he has to put everything else aside and he may spend 10-15 hours on calculating a change. He takes 80 Euro an hour for his work. How will he get his money if his work does not result in an order? Then something new comes up, and he has to calculate again. Those hours have to be covered somewhere.” (Contractor p. 16)

This suggests that architects’ preference for open ends and collaborative efforts were counted as costs to be recovered and consequently, the price of the building would increase. Even if possibly, the procedure could have different effects if it were applied in [country 1], in the case of Animal House the contract favoured an engineering project rather than an architectural project which required a mode of cooperation of a different kind.

Technical quality. Animal House was designed to have a heavy glass roof which was its premier symbol. As a symbol, the glass roof was designed with many architectural ambitions and was very complex. Obviously, there were concerns to make sure that the walls of the building were able to carry the roof. A full time structural engineer was allocated to calculate and assess the strength of the building.

The engineer’s calculations modelled the amount of armament necessary in the concrete and this was then translated into instructions for a subcontractor who used it to plan its production. However, the subcontractor was based in [country 2] where norms about armament differed both from those in this country and those of [country 1]; the production was seamlessly translated into work orders using the norms of [country 2]:

“The subcontractor of concrete [from country 2] has not added our required amount which accords to this country's legislation. Therefore, we are now calculating whether specifications are so that we can get on the right side of the lower fractile. In [country

2] they use a different calculating model. Soon, we will have common EU rules in this area, but it is not so today.” (Consultant p. 21)

The calculating effort was mediated by internationalisation which could frustrate calculation of quantities of armament and concrete and then also of cost.

Quantity of materials. Exactly how much concrete was to be used in the project? The answer differed depending on its time and space. During budgeting, consultants developed rough estimates, “to give the contractors something to work with.” When the contractor then started to claim payment for materials the calculation was questioned both for quantity and for unit price because the quantities and costs would often be surprising:

“We have not been precise enough in the budgeting phase. But at that time the calculations was based on estimates because we didn't have the details yet. We have therefore made overall calculations. But the armament that is placed here and is sticking up from the floor is extra.... I have taken all the contractor's notes about this issue, where they have written about the amount of armament. In their material requirements, they have then written an amount: 2 tonnes extra armament. I have used this and recalculated it. I arrive at 1.5 tonnes extra armament.” (consultant p.2-3)

During budgeting, the consultant calculated concrete and armament but with a different degree of specification from the one developed by the contractor. This was not surprising as such because the budgeting phases evaluated a series of different options while in the construction phase, the option chosen was the object of further calculation. There was a difference between the chosen option when budgeted and when calculated for the work plan because the budgeted option appeared to focus on the visible part of the concrete rather than also on the joints and connections which would be invisible in the finished building. The contractor added the extras that “stick up from the floor”. Therefore, calculation could develop very different assumptions:

“But my goal with this number is not to be exact; my goal is to reach it within 10-15%, because I have to see if the contractor's demands are reasonable, that's all. I know that even if I calculate exactly and the contractor does the same, we will never get to the same amount. What we can go for is to find a place where we can arrive at an agreement. And if we don't agree and I say 7 and they say 52 then I know some things are really wrong. That is why I said that I would like them to recalculate the

whole thing, because it makes a big difference whether it is 10% , 20% or 30 %.”  
(consultant p.4)

When construction started, the contractor commenced a detailed recalculation of the elements that consultants had earlier calculated in the budgeting phase. Therefore, the consultant had to defend his calculation even if he proposed that no degree of detail would ever make the calculations between him and contractor similar. The aim was for all to keep face and get to an agreement about the result. This negotiation had to narrow the gap between the calculations; they did not have to agree on an ‘underlying reality’.

The negotiation went far but not so far as levelling out the differences between the contractor and the consultant. It was not opportune to share calculations:

“It is clear that we want to get paid for the iron we put in the project. The tender has not been based on fair amounts of iron. There has been some drawings and some solution sketches. So, we had to calculate all the amounts ourselves, and that is waste of time, because the consultants have them, because they had to give the price for the construction. But often these calculations are the assumptions and if they published them, they would also have to account for them. Now they expect the contractor to act foolishly and hope they will forget some numbers.” (contractor, p.2)

Accounting for assumptions could be difficult. Who knew the right assumptions? The consultant knew that assumptions were rough numbers and therefore most likely some things were inaccurate, optimistic, or just wrong. And the contractor was convinced that assumptions could be challenged. Since right numbers could be difficult, negotiation could be the appropriate response because revealing the specifics of assumptions would escalate disagreement.

Effect on variance. Many issues were open for negotiation and results were compromises. When changes were contemplated, costs would be added, as the example of the wooden seat suggests. When internationalisation was involved, strength of walls would become uncertain and required amounts of materials were open for negotiation. And when differences in cost estimates were negotiated rather than shown because assumptions would have to be accounted for. Many such instances took place. In all, the spreadsheet with change requirements each representing a disagreement had more than 160 lines. Each of these lines was negotiated based on calculations made by diverse and dispersed calculators.

Client, consultants and contractor all calculated. New calculation was often motivated by the claim of a project change. But what was a change? Some changes were made assuming that they would not have financial effects. In the beginning, the client did not assume that a change of seats would change any costs because a switch from one material into another equally expensive one would be neutral. The question was how much of the resources described in a change would also materialise in the change of the financial position when some resources could be reused and sometimes resources could simply be sourced from elsewhere.

But how did this account for the resources used to plan, the contractor would rebut. Since the contractor could make claims whenever changes had been made, it was not sufficient to calculate the required amount of material from scratch. Often the consultant re-calculated from the principle of differential cost looking also at savings in and additions to materials:

“They have made a claim for payment of 2 tonnes of iron, which is extra. Therefore I have calculated how much extra I would need, and I think that it is possible to subtract some here because we can make the hole narrower. On the other hand they need more iron there and that is an addition. The hole is a half meter deep here but in other places it is only 25 cm deep. Then I arrive at the result that they have to be paid for about 1.5 tonnes extra iron.” (Consultant, p. )

The consultant calculated the differences between the original and the alternative suggestion. The contractor suggested a different calculation beginning from the disruption that a project change would incur:

“It doesn't matter what it is; all changes cost money. If you take money out of the project, then it cost money. Imagine that you have a black-smith to calculate some changes. Every time he spends time calculating something, and he normally takes 500 Dkr per hour when he works. He has to get this money back from somewhere, so if he spends 5 hours calculating, no matter if you use this solution or not, he has to get paid.” (Contractor, p. 16)

When dispersed actors calculate they might agree generally on the object to be calculated but how was e.g. a wall which was known for its square-meters to be understood in terms of strength? Each had their calculative model, but they were secret and arrived at different results:

“How do you get to the amount of armament in the concrete? If you take a square box it is relatively easy to calculate its volume. But it is always more difficult when it is the iron you add to it. Because there are different way and methods to do it, and it is also not given that the consultants have been able to describe in detail exactly how they expect it to be happen.” (Contractor, p. 1)

Calculation required assumptions; assumptions were difficult to account for. There was a limit to the calculability of things and therefore negotiation was preferred. The goal of negotiation was to reach a state where participants were satisfied that it was not too far from their own calculation even if the result could not be proven. No one could prove the cost; not even the cost produced by their own calculation.

### *The temporality of negotiation*

Negotiation happened, but how? Tables 1a and 1b illustrate the progression of settlement on four issues that were difficult for the project team. Two issues concern the preparation of the site (soil work and management of ground water) and two concern the design of Animal House (choice of columns and colour of concrete).

Issue	September	October	November	December
Removal of polluted soil		Contractor calculates the cost of sending polluted soil to soil-hotels and claims this to be beyond the contract. Consultants agree about the difficulty of classifying how polluted to soil is, but claims that contractor should inform about cost consequences.	Client advisor proposes that contractor’s claims are not documented. Consultants suggest that contractor should have send off the polluted soil long ago and not moved it on the ground several times. Detailed soil analysis still not completed.	
Handling groundwater				
Design of columns	Architect changes design columns from circular to conic shape. Client asks for quick response and does not accept delays.	Client accepts change of columns. Architect proposes new positioning of the columns of the ground. This influences design of	Client and consultants are surprised about the costs of the changes proposed by contractor. This induces change in	Contractor suggests that reduction of types of production moulds reduces costs significantly.

		armament and requires replanning.	surface of column, reduction of types of production moulds, and removal of mobile columns.	
Choice of colour of concrete	Contractor mocks up 2%, 4% and 6% coloured concrete and suggests a quick decision or the price will go up.	Colour is problematic because it is made out of different sand from different location and the architect rejects the mock-ups. 6% colour concrete is decided. Contractor suggests that 6% is extra costs	Client advisor claims that the extra cost is not documented, and consultants say that 6% is similar to the costs of the colour in the tender document.	

Table 1a: Temporality of four issues

January	February	March	April	May
		Client and contractor disagree on the cost of removal of polluted soil.	Proposed settlement of cost issue but contractor develops new claims.	
Client wants the original six different moulds, and consultants are paid extra for project change work.				First column ready for placement on the ground.
Contractor justifies the claim of extra costs of 6% colour.			Proposed settlement of the dispute but the settlement is cancelled.	

Table 1b: Temporality of four issues

Preparatory work was documented via photographs and notes via daily inspections on the site and yet they were difficult to communicate because they concerned issues that had to disappear and that were available only via modelling. How much soil was polluted? Was the water groundwater or rainwater? Preparatory work made the site possible for construction. It ranged from preparation of the ground to setting up the cranes, the mobile offices and safety arrangements. These activities would not be part of the Animal House per se, and yet their costs amounted to about 10% of the budget sum.

Design work influenced the building directly. Architects were intensively involved in these issues but others also participated energetically. The contractor had to achieve the architectural standards, just as safety regulations vis-à-vis animals and visitors had a say, and the client was openly proposing the character of the building and its location. We illustrate this by the design of columns positioned inside and outside of the building, and by the choice of colour of the concrete walls which are visible inside and outside the building.

Soil-work. In cities most sites were proposed to be polluted to some degree. It was illegal to keep polluted earth on the site. It had to be removed and paid for by the client. But how much soil was polluted? And which classification of the concentration of pollution would it get? The concentration was different from place to place on the site, and therefore several tests had to be made. Given the variation in concentration, removed soil was eventually placed in three different soil hotels. But its way to the soil hotel was convoluted. Since the client should pay, should the client be offered the option to remove the soil or should it be part of the ongoing work performed by the contractor? How should they account for the time spent on consecutive re-placements of polluted soil on the ground made necessary to enable the development of the construction site before the soil-hotels were chosen? Who should account for the concentration of pollution? The tender document suggested that the classification was almost clean but this changed as the process of moving the soil began. But then, how much soil was not almost clean? And then, who should clean the site after the removal of dirty earth? Such and many more details in this consideration made arriving at one cost a cumbersome activity.

In October 2006 the client asked for a price of soil work. The contractor believed the soil had to be removed from the construction site into a soil hotel. On October 11<sup>th</sup> the contractor made a verbal financial claim justifying this by suggesting that it was extra work beyond the contract because removing the soil was urgent. It lay on the surface and barred the development of the construction site. As illustrated by Table 1, the client advisor first suggested that documentation was lacking. And the consultants suggested that the removal of soil actually made the work of the contractor easier because it opened the site and made production easier. Then there was a four months period where settlement was negotiated. In April 2007 a settlement was almost reached and an agreement was to be signed, when the contractor developed new claims that were not handled until May 2007:

“The soil has been a huge problem. And again, we have different assumptions. Our assumption was that the soil was clean (unpolluted) so we would be able to work. But it was not. And afterwards the client and the consultants tell us that they didn't think it was clean.” (Contractor p.30)

The communication about soil took a lot of time. One of the reasons was uncertainty about what different parties knew about the site and how they should inform the others.

Groundwater. The site was on a hill in the city, and yet there was water near the surface in a hole. But was this water groundwater or rainwater? Groundwater would be structural whereas rainwater would be circumstantial. The contractor proposed groundwater while consultants claimed it to be rainwater. Groundwater was more expensive to remove and control than rainwater which would only appear episodically. Experts were asked for their opinion, but they were in doubt and to be certain that the building would be able to stand the pressure of water, groundwater was the preferred conclusion.

Pumps had to be installed to remove the water; that was clear, but how and when? The contractor rented out their own pumps for this operation which allowed the process to commence quickly and the site would gain time and productivity by early drainage. After two months in operation, the contractor forwarded a claim to cover the rent. It turned out to be similar to the price of buying four pumps. What would be the right price to pay for in rent? Were the water groundwater, pumps would be expected to work for a long time and the rent would be high, but were it rainwater pumps would only be needed for a short period, and then the rent would be acceptable. On the other side, did the water really stop the contractor from working 2 weeks as claimed, and what would then be the net result of the economics of the pumps?

The water and the pump developed various scenarios about the sources of the problem, the character of the problem, and the extension of the problem. They required knowledge about the status of water, which was uncertain, and knowledge about the cost and opportunity costs of the production capacity, which was also uncertain. The character of the calculation depended on such premises which even experts had problems sorting out.

Design of columns. In the tender materials the columns were presented as circular but later, having more experience with the details of the building, architects suggested a more distinct expression by changing the shape from circular to conic form:

“It’s because the architect changed it. They were drawing on some idea, but then they found out – and this is my interpretation – that it might be too similar to other drawings made by other architects. The architect can not accept that; it will influence his reputation. Therefore they needed a different design for the columns.” (Contractor p 13 )

With the aspiration to make the Animal House an expressive building changes were proposed again and again in view on new interpretations of the character of the design. In September, the contractor focused on the economics of the change and yet the client accepted it in October. But time was running out as the change had developed a new urgency since production had to be scheduled. The change developed and a problem in the drainage system was related to the placement of the columns of which a good part was re-located inside the building. This affected the armament of the columns for stability reasons and suddenly a new process of planning and calculation was initiated – the contractor’s calculation of the financial effects of the change amounted to 700% the previous estimate. Architects attempted to redesign the columns, and in November they proposed to change the surface from super smooth to smooth. This would keep the variety of columns in place, but the contractor suggested simplifying the architectural expression and reducing the number of types of columns from six to two which would reduce production complexity, increase time-efficiency and reduce investments in moulds. Architect and client did not accept the simplification of the architectural expression. The columns emerged on the site in May but had been underway from subcontractors for a long period of time.

Colour of the walls. It was not difficult to decide on the colour of walls, but the agreement about its financial implications took six months. In September 2006 the contractor required an answer to how much colour the client and the architect wanted in the concrete because they were about to set production in motion. A series of mock-ups was produced which showed three different colours of the concrete: 2%, 4% and 6%. The client suggested the colours to vary between different mock-ups since they used sand from different locations. A week later, the colour of concrete was chosen to be

6%, and the production of the concrete began. 14 days later, the contractor claimed extra payment because of what was suggested as 2%-points more colour than proposed in the tender document.

“We all agree that 6% looks best and is the solution for the colour. We decided to go on with that. But then, the contractor makes the claim that 6% is extra. It is a test that they made on their own initiative without saying that they have been playing with the colours, and without saying that production of the 6% would be more expensive than the others. They argued that therefore 6% could not be part of the tender.” (Consultant p. 14)

In beginning of November the client adviser replied that the contractor had not documented the extra cost well enough. The consultant wrote the contractor a letter saying that the 6% colour was similar to the mock ups presented in the tender documentation. What did the tender document really say?

By the end of January the contractor suggested a settlement justifying their demands, but later, in April, the contractor changed the claims upwards. Consultants and client were furious.

#### *Structuring negotiation and dividing concerns*

It was difficult to arrive at conclusions that incorporated architectural, engineering and economic dimensions smoothly. As illustrated above, many issues were prolonged and took time and even if production activities in many cases had started and had to proceed due to time, the economics of the construction was negotiated far and wide before, during and after commencement of production.

There was already a separation between production and economic negotiation because time and the progress of the building were important. This separation was also acknowledged in the types of ways the participants developed negotiation. There were three types of meetings each oriented towards managing different problems which were then separated in time, space and membership – project meetings, project status meetings and economic settlement meetings. These meetings also constituted a sequence of escalation whereby an issue that could not be resolved in one type of meeting would be carried further to the next.

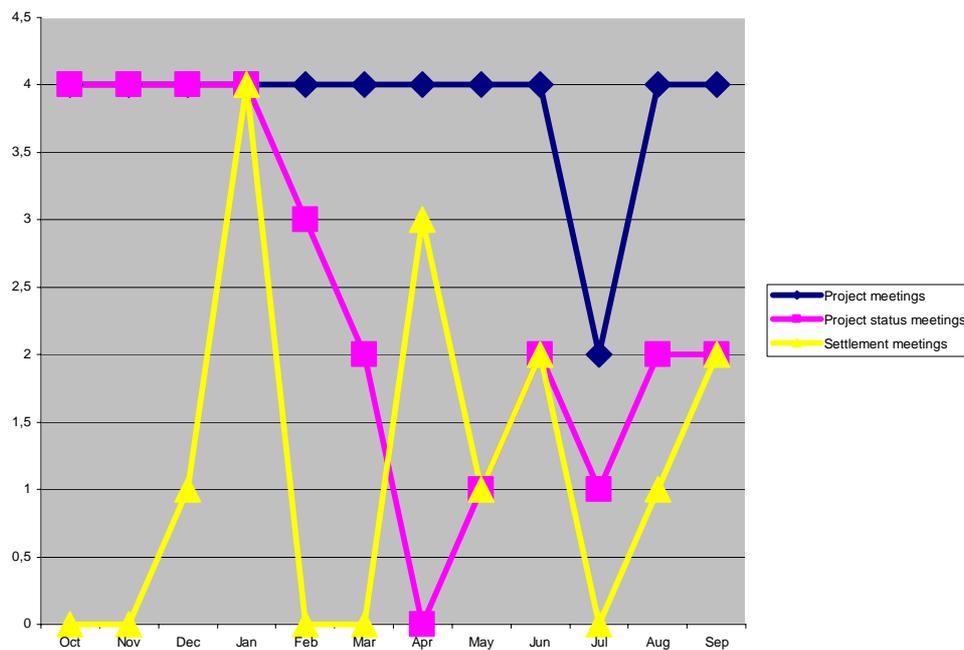


Figure 1: Distribution of meetings across a year of the construction

Figure 1 illustrates that project meetings were held four times per month (once per week) throughout the construction period apart from the vacation month. It also shows that the project status meeting and the economic settlement meeting were less bound by the calendar. They peaked differently. The project status meetings were frequent over the first four months where the organisation of the project was still a critical concern. The settlement meetings could not start until a series of difficult cases were present and they peaked in isolated months where issues from project status meetings were escalated. There were 46 project meetings, 29 project status meetings and 14 settlement meetings. The existence of project status meetings and settlement meetings correlated negatively ( $r = -0,14$ ) indicating that they to a certain degree had different roles to play and that the project status meetings monitored the project, while the settlement meetings interfered seriously in the relations between the participants.

The project meeting involved the contractor, relevant consultants (not all were present every time), the construction site manager and the client. The meeting was concerned with issues concerning progress on the construction site and attending to time schedules, allocation of men, movement of materials, quality, holiday plans and the budget. The discussions centred on the

logistics of production and coordinated e.g. arrival of columns, the production of concrete, and handling the pumps to remove water.

The project meeting minutes contained all current issues and as soon as the issue was settled it was deleted from the minutes. The document was an agenda for the meeting, and it helped to make detailed propositions about the events needed to make the project progress on the site. For this endeavour the whole construction site was divided into small areas – to such an extent that parts of wall would be identified – each of which was equipped with a number that referred to a drawing of the construction site and was part of the meeting minutes. In this way, architects and consultants could know where to engage quality control.

Project status meetings were different. They engaged all consultants, contractor-management, client and construction site manager, and the aim was to manage the results of the project. Activity and financial plans were monitored; activity plans scrutinised; and the overall time schedule supervised. The main concern was to make participants responsible for planned and executed activities. The meeting's agenda was fixed throughout the whole project: (i) status on the current project materials; (ii) status on current discussions; (iii) status on current organisation of the project, and (iv) budget.

From October 2006 to March 2007 much of the discussion in project status meetings concerned releasing architectural and engineering drawings. Here negotiations about movement of soil and its movement to soil hotels happened, and later the associated negotiations of economic consequences took place. This meeting decided who should test whether the water was ground- or rainwater, and here architects and contractor proposed solutions to the number of moulds to be used to make columns. This type of meeting was also used to coordinate document standards and rules and principles for cooperation. The budget was also a standard item on the agenda. Over time the agenda was taken over by a spreadsheet which related all issues to time and money putting deadlines and economic outlook on one page.

The last type of meeting was the economy settlement meetings where disagreements on costs between client, consultants, architects and contractor were negotiated. This type of meeting considered the overflow from the other meetings so that issues that could not be settled in project or project status meetings ended here. These meetings were held December 2006-January 2007 and again March 2007-May 2007. Their agenda were organised around a budget and its associated variances: One column for the original budget, one column for the claims made by the contractor, a

column for what the consultants believed would be fair numbers, and finally a column for issues that had been settled and the agreed amount of money. The horizontal lines presented each claim which then had the four characteristics along the columns. Each line item was detailed in accompanying folders that kept track of claims, correspondence and the different views on each single case. This type of meeting was well prepared and information was abundant.

Irrespective hereof, settlement was not easy. All cases were difficult as they had been processed in other meetings before. They also took long time, as is witnessed by Table 1, and they accumulated into numerous difficult cases. How was settlement accomplished here?

“We agreed on a settlement which contained a lot of elements. The settlement closed a lot of prior discussions about soil, colours of concrete and a lot of other items. And then part of the settlement was to have a plan directed toward the future for constructing and keeping the budget, to avoid the same situation to happen again.” (Client, p.4).

The settlement did not treat the cases sequentially. In contrast, it pooled cases – such as 10-30 cases – and agreed on a common result. It was impossible to add a lot to previous discussions, and it was clear that if cases were reopened, the debate would repeat itself and mirror the last several months of negotiation. All claims were summed up and compared with the consultants’ idea of fair cost, and then it was reduced a bit to accommodate the contractor. The individual cases were not traced; this was impossible. The settlement was to “draw a line” and “clear the air” thus getting rid of the residues of the past and look towards the future.

#### *Allocating praise and blame*

The difficulties at arriving at one solution described above created a setting of tension about the contributions and rewards accruing to participants. The difficulties developed in negotiations where participants had to explain themselves and justify or excuse their actions and activities. All were at the spot. No one was always right, or always wrong.

The project espoused ideas all the time. These ideas concerned architecture as well as production. Architects made a point of incorporating new knowledge in the design and asked, in principle, all to contribute, but contractors also made a point of problematising the building when it was cumbersome. The interdependencies between actors created a collective on its way towards a

building, but the tensions singled out potential individual weaknesses which changed and developed over time. But how were ideas accounted for?

Ideas had with them the aura of carefulness and concern. Two architects worked fulltime to develop and accommodate ideas:

“They have two full time architects on the construction site. I never tried that before, in a different much bigger project we had 25 architects in the team, not one single of them were available. So here they like to be part of the details, which is very exiting to us, but it cost a lot of money.” (Contractor p. 27)

Architects symbolised costliness but they also invented good – exiting – details. They worked towards the building’s reputation and their own. They were blamed for cost overruns but praised for their ability to create. Blamed was also the contractor:

“Every time we ask them to do something, they demand more in return than what they were suppose to get. If they can get away with it, they require a huge sum of money. That is the reason we have these big fights every time we talk about money.” (Consultant p. 9.)

Blame is allocated for miser-behaviour, but also, the contractor was praised for accommodating late drawings, producing change propositions, and delivering high quality and superb organisation:

“Now the job is almost done, so they can reduce the manning, the contractor has really manned the site well, it is really fine. That is all you can say to that. I have never seen such a well-manned site before. The contractor could easily have muddled his way trough, and left the progress to the subcontractors. This is serious work.” (Client adviser)

If the contractor was blamed for a greedy attitude, they were also praised for the seriousness of their work. Also consultants were allocated blame as well as praise:

“The tender document has not been based on the appropriate quantities, it was some drawings and some solutions described in principles, and then we had to calculate all the quantities ourselves. And that is not ok, because the consultants know the numbers; they had to calculate them to give an indication of the cost of constructing the building. But often they are not willing to share the information, it is their answers. If they had been sharing them, they were made responsible for those numbers, and

that's part of the game, now it is possible to say that the consultants might have made a mistake and forgotten some numbers.” (Contractor, p.2)

Singling the aspect of information sharing out, consultants were allocated blame but when they performed a more active role in managing the project, they were praised:

“The communication between the architects was very tense in the design phase. Our role was to try to make the team look in the same direction. And we did get hold on a lot of things and ended a lot of issues. We broad the project on a level where it was possible to progress, I just think it is irritating that we have to fight.” (Consultants p. 6)

All participated without purity. Constructors were blamed for their greed, but praised for their abilities; consultants were blamed for their cursory calculations, but praised for their organisational skills; the client was blamed for change of mind, but praised for their ambition and ability to support ambition and raise relevant monies; the architect was blamed for their lack of settlement of the drawings but praised for their sense of grandeur.

The allocation of blame and praise was not continuous, however. The process of singling out blame was associated with escalation from project via project status to settlement meetings. This escalation made participants' separate interests clear. During project meetings participants were concerned to escalate issues that they could not quickly get to agreement about and they continued the process of establishing the building. When escalation happened, however, the building was not more the object of interest; rather effects were ascribed to individuals who were singled out of the collective process and made the source of concern:

“Almost as a law of nature there is a large difference between the prices given from the contractor and the consultants. This is why we accepted the advice from our client advisor, because they have the experience to identify that it was reasonable what the contractor claimed, and they knew that if we went to court with such case, the contractor most likely would win. Because the conditions had changed for the project, and because the contractor would fight to the end to get it, we were better off by landing somewhere in the middle. Then you don't get either the contractor or the consultants to change their mind.” (Client p. 6)

Blame and praise was allocated carefully here because the issue was not only the cost of the building; it was the whole social organisation of the setting. No one was only blamed, and no one

was only praised. But when concerns about blame and praise were aired they required a particular organisation to do it – the settlement meeting.

### **Circulation of Accountability: The ‘We’ and the ‘I’ in Accountability Relations**

The budget variance calls for explanation. The simple mathematical operation to subtract an accounting statement from a budget statement carries a huge load of blame and/or praise allocation. As evidenced above, the concern for variance starts many types of negotiation.

With Serres’ notion of quasi-object, the variance may be considered an entity which induces separation between ‘We’ and the ‘I’ (see Brown, 2002). The variance is treated differently when it is part of project meetings compared with its existence in settlement meetings. The project meetings are concerned with the collective in the project where participants develop and realise a common ambition and are able to find courses of action which allow the project to proceed as an entity. This is the ‘We’ which can only be understood as a flow of action where individuals move in relation to each other and make the progression of the collective the primary aim. The ‘We’ is concerned with movements that not only bind the collective but also makes its efforts focused; individuals accept collective ambitions and decisions.

The settlement meetings are different because the ‘We’ has been substituted by the ‘I’ which is the individualisation of responsibility and where the collective faces break-up. This is where the individual stands out and stops the process of the collective. This is where the variance stops the process and call for inquiry to make the individual contribution a matter of contention.

Brown (2002) uses the example of a rugby game to illustrate the working of a quasi-object (the token) which in this game is the ball:

“Consider a game of Rugby. The players are oriented around the ball, the token. They act in relation to the token. They are the means by which it passes. Their movements have the sole aim of maintaining the play, of passing the token between one another. In so doing weaves the collective. Which is to say that the relationships between the players are defined by how they position themselves in regard to the token. It is the movement of the token that defines their relations. Now games often have their origins in cruelty and terror. And here is the terrifying aspect. Who will be caught in possession of the token? Who will be left with it when the play stops? She or he will be ‘it’.”

Using this analogy, the case of Animal House can help to explain a series of queries about accountability. The quasi-object (the token) is the variance. The participants act in relation to the variance which is passed on and negotiated in the three different meetings. The negotiation distributes the variance between participants but in different ways in different settings. When the project meeting plays out, variances are accommodated, reduced, managed, and accepted without much fuss and the construction of the site and the building proceeds. The setting sees participants as not losing the variance and not stumbling over it; the variance requires accommodation and re-coordination and the process of construction goes on.

Variance – the quasi-object, the token – is dropped in settlement meetings. The process stops and has been stopped for a while and someone is singled out as the one in possession hereof. This someone is ‘it’; the process is frosted into a picture where one participant holds the token and the others wait, stare and point fingers at him. The process is changed from a moving game to a frozen picture of an individual that disappoints the rest.

The separation of the ‘We’ from the ‘I’ marks a general transformation of accountability. There is not only hierarchical accountability as the one exemplified by the settlement meeting; there is also socialising accountability as exemplified by the project meeting. Their existences are not structural because their relative weights cannot be predicted: The weight in the setting depends on the message of the variance. The two movements are important because they illustrate that accountability has different forms, and given that one form does not dominate all the time, and given that no single individual will disappoint all the time, accountability circulates – in form as in object.

Who is ‘it’ is a difficult question to answer, because it depends on when the question is asked and what the issue at stake is. Who causes the variance? They all do. They all add to or subtract from the various kinds of performances in architecture, engineering and economics of the setting. In the project mode, there is no point in asking the question because the orientation is not the production of the variance but its obliteration. Generally, here the variance is invisible because it is not constructed, and when it is constructed it is expected to vanish by the intervention of the meeting – the project is a collective concern.

The origins of the variance is at stake in settlement meetings and here the only mode of operation is to pull part connected and interdependent activities. The possible worlds explored by

proposing opportunity costs and questioning decisions develop new scenarios where individuals are separated out and judged to influence the performance of the collective. As shown above, all have had that position several times during the process. All have disappointed the rest, but all have also entertained the rest by shrewd and competent moves. And therefore, who causes the variance depends on when the question is asked.

In the case of Animal House, it is important to take risks and therefore the probability of variance is present. Here, ideas develop the construction and the task of the architect is to develop novelty and persuade others to engage. Ideas develop the building which creates reputation not only for the architect; also for all others involved. It is a resource for participants. The architect is thus strong and commands the variance, but the architect is also weak. Architects' ideas, being new, concern change. But change upsets the setting because it is appropriated by others to suggest that the variance is larger than first proposed. Change is presented as causing cost overruns and delays; misunderstandings and conflict; re-work and waste. This develops patterns of blame and praise. As shown above drawings have been late, there have been uncertainties about the project management role, there is miscommunication about the financial effects of decisions, information is withheld. Many things hamper the progress of the project and justify the variance. But there is also praise of all parties over time because they interfere so that variances in various domains such as architecture, engineering and economics become favourable. Accountability circulates in form and about objects.

These considerations help us to develop a proposition about budget variance. Firstly, it is analytically cumbersome, perhaps futile, to state where it comes from and it is a huge, if at all possible, task to sort out all the economic dimensions of a variance. Secondly, circulating accountability makes it cumbersome to identify whom to 'blame' and an actor once singled out as a problem at one point in time can become a hero at different times. Events are re-interpreted and the capability and competencies of participating actors are not stable. Accountability circulates.

In addition to politics and optimism, the budget-variance can also be understood as a proposition about accountability – the giving of accounts such as justifications and excuses, and the singling out of responsibility to actors when the collective 'We' stops working as a process and focuses on the 'I' which is when the process comes to a halt. There are constant translations between budget and building and still, in spite of all this activity, the variance can be significant. Or rather, the intense activity involved in translating between the budget and the building makes the

game a heated one where economics participates in framing the building but is not its only parameter since project meetings go on even if the project is at a halt in settlement meetings. The collective works towards a building even if the settlement e.g. of economic concerns is still open. The project group keeps working in spite of economic unrest because this has been exported from the realm of logistics and production into project status and settlement meetings. The building is ahead of economic settlement which apparently cannot happen quickly since negotiation rather than demonstration has the final say. The building is typically ahead of the economic settlement.

### **Conclusions**

The first observation is that the concerns involved in predicting the costs of the building, the activity of re-designing it in view of the budget-sum and in view of new knowledge established while building look like the concerns and activities involved in the previous budgeting process. This involves re-evaluation of items already in the budget, but it also involves new types of concerns that have not been encountered in the budget such as deciding about activities in soil preparation, settlement of the colours of the concrete of the building, issues about subcontractors' work, settlement on details of the architecture, and processes of quality control. There are also a whole set of meetings designed to settle financial disputes between the parties involved in the construction and therefore, financial accountability happened all the time.

The second observation is that the budget-variance is a quasi-object. As such, when it moves around and each partner engages in developing it, reducing it, pushing it into another realm, making sacrifice and taking advantage, it gives the process certain characteristics inviting deliberations and choice making. The budget variance starts moving immediately in the process and it is singled out long before it has a manifestation in the final set of accounts. It moves around from the beginning. When it moves, it does not identify accountability, however, because it concerns the collective – the 'We'. Sometimes moving around stops and this is when the variance proposes a dangerous space, the game stops and an actor is pointed out and accorded the role of constraining the realisation of the project. The transformation from the collective 'We' into the individual 'I' develops accountability. This is when responsibility is attached to the variance and a settlement has to be performed. In these situations, variance has typically developed along numerous different

paths simultaneously, and multiple actors' calculations of the causes of the various types of variance develop an unexplainable space of multiple propositions of variances. This motivates stopping the game, and a set of meetings are designed to 'draw a line' and 'clean the air' where a compromise is made so that the game can go on. Accountability moves around and at each partner has at a certain point in time been pointed out as the actor that constrains the progress of the project. Accountability-pressures move between all the participants.

Yet the organisation of the setting around three types of meetings separate between logistics and operations on one side and economics on the other. Logistics and operations are typically far ahead of economics because time and material require intervention on the site, while economics require social negotiation which takes time.

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