

# ACTIVATION OF HIDDEN RESOURCES EXPERIENCE FROM A DEVELOPMENT INITIATIVE IN A REGIONAL AREA IN DENMARK

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## ABSTRACT

Research for improvement of the effectiveness and the efficiency in the construction process has been in focus during the last 15 years. Although serious efforts have been made to disseminate the outcome of the research the effects seem limited. The Danish construction sector has an understanding of the necessity of improvements. However, many consider their knowledge about the latest initiatives and research results inadequate, presumably because they have difficulties linking the more theoretical approaches to their day-to-day work.

A regional development initiative, BYGiNORD (in English: Build-in-the-North), started in the spring of 2003. Since then about 75 committed practitioners from the construction sector in the region have discussed new ideas and methods for improving the construction process. The discussions focus on the participants' everyday problems and their experience from practice and touch upon several issues encompassed by the concepts Lean Thinking and Lean Construction. Arrangements have been made for testing the ideas on regional construction projects in the next phase of BYGiNORD.

The experience indicates that there is a great potential for activating the often hidden resources within the construction sector itself and for creating rewarding work relations between academic institutions and practitioners in the construction sector.

This paper elaborates on the experiences gained so far. They will be presented along with a discussion on how to activate a greater deal of the workforce as an important source of ideas that could stepwise improve the construction process.

## KEY WORDS

Learning region, action learning, lean construction, ownership, efficiency.

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## INTRODUCTION

The lack of improvement of the efficiency in the Danish construction sector has for decades been discussed and many initiatives have been taken in order to improve the situation. Figure 1 illustrates the labour productivity as an indicator to this problem. Although thorough evaluations of the impact of the initiatives have been scarce several studies point into one direction: The impact has been limited.

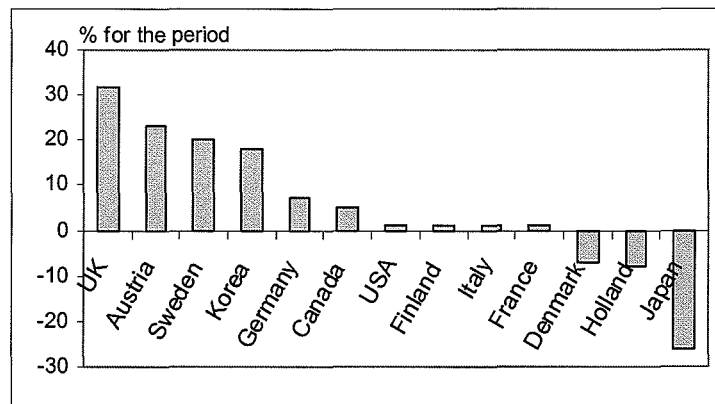


Figure 1: Total Growth in Labour Productivity 1990–2001 in the Construction Industry. (OECD 2002).

Recent initiatives have adjusted their focus from product over process orientation towards modes of co-operation within the construction project and of making the client more professional. Several of the larger Danish contractors have adopted ‘partnering’, a mode of co-operation between two or more parties involved in a construction project based on dialogue and trust instead of adversity and distrust. In addition, several projects have been formulated as research projects and preliminary results seem promising. Partnering has now become one of the four focal areas for the state government efforts to increase the efficiency of the sector (DK 2003): New modes of invitation to submit tenders and co-operation (partnering is mentioned explicitly), architecture and aesthetics, key figures and benchmarking, and application of IT.

In order to improve the level of professionalism of clients in publicly subsidized housing projects the Danish Parliament passed an act in August 2002 followed by a ministerial decree in March 2003 which demands that the client be found through a competition in order to select the most appropriate client for the purpose of managing the construction process.

## THE BYGINORD INITIATIVE

Inspired by the partnering discussions the largest Danish association for publicly subsidized housing, *Lejerbo*, began efforts to arrange a conference on partnering in Aalborg in Northern Jutland (NJ). During the preparations the Act mentioned above was passed and it was decided to widen the scope of the conference as the Act will lead to changes in the mode of co-operation between the local government, the client, and associations like *Lejerbo* who had

until the Act came into effect been appointed by the local government as client during the construction period as well as manager in the phase of use.

In addition to *Lejerbo* a mortgage credit institution, *Realkredit Danmark*, and *Aalborg University (AAU)*, *Department of Production* were the founders of the initiative and a steering committee was formed. The committee named the initiative BYGiNORD (In English: Build-in-the-North) and acted as the organizing committee of the conference. Based upon the intention to make the involved parties achieve a more holistic view of the construction process the committee formulated three themes each with a set of Terms of Reference (TOR) and a theme-chairman to be the pillars of the conference. The themes were:

- Theme 1. The user, the professional client and the local government's invitation for tender on the role of the client,
- Theme 2. Future modes of co-operation in the construction sector,
- Theme 3. Co-operating supply teams and the future production at the building site.

The conference was regarded an initiator for future development activities in the region of NJ and it was anticipated that some of the ideas generated at the conference would be further elaborated in thematic work group activities and later on tested on actual construction projects in the region. Figure 2 illustrates the envisaged flow of the initiative.

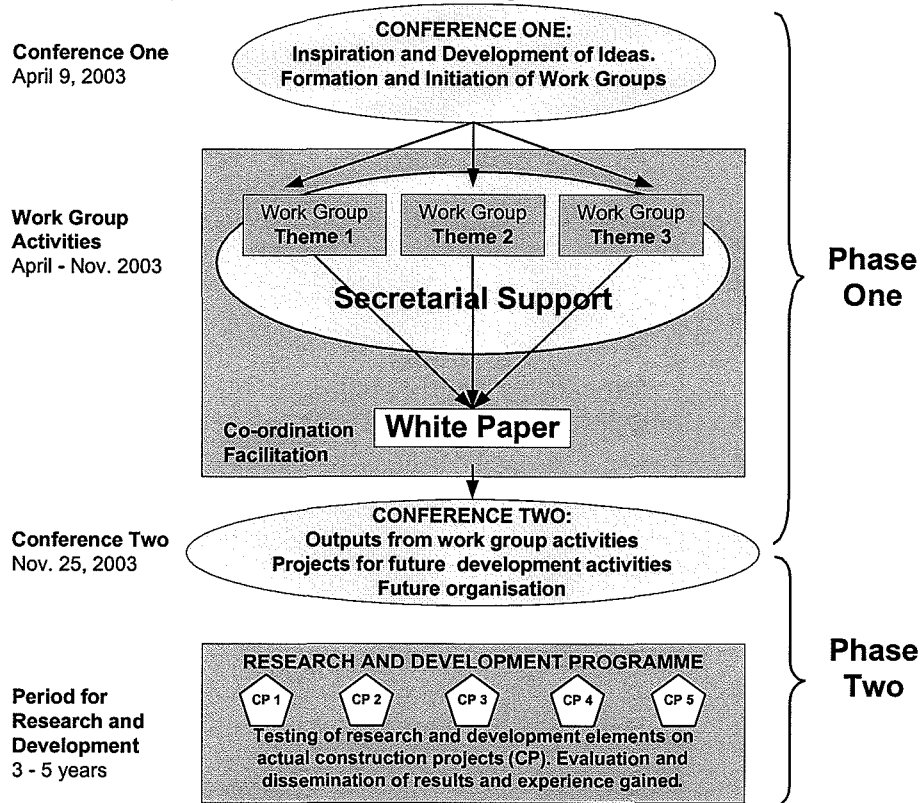


Figure 2: Flow of the Initiative as Envisaged by the Organizing Committee. Dates of conferences have been added later (Figure 1.2 in BYGiNORD 2003).

The purpose of this paper is to describe the course of Phase One of the initiative and to evaluate whether the approach applied was appropriate and furthering for Phase Two.

## **PHASE ONE**

Phase One was planned to take its point of departure in Conference One and then, through group work activities for half a year to end with a second conference which should sum up the results gained and stipulate guidelines for the further work in Phase Two.

## **CONFERENCE ONE**

Invitations for Conference One were sent out to a wide scope of persons with a professional interest in the construction industry in NJ and more than 200 from the state government, local governments, the association of clients, associations for publicly subsidized housing, mortgage credit institutions, architects, management consultants, consultant engineers, contractors, suppliers, and research and training institutions attended. The conference venue was a conference hall at the soccer stadium in Aalborg.

The speakers at the one-day conference were local politicians, local authority employees, consultants presenting among other topics the basic elements of Lean Construction, and members of the steering committee. Afterwards several workshops were organized and discussions took place based on the contributions of the speakers and the experience of the participants. At the end about 75 persons committed themselves to continue the discussions in work groups within the three themes previously stipulated.

## **PREPARATIONS FOR WORK GROUP ACTIVITIES AND STUDIES**

The steering committee was contented with the course of the conference and it was decided that the product of Phase One should be a 'white paper' which should include a 'Scouts Manual' (in Danish: grønspættebog) with brief descriptions of solutions to problems identified and discussed by the work groups. It was underlined that the manual and the white paper must be short documents as the target group comprises extremely busy persons.

It was envisaged that also the members of the work groups would be very busy with their day-to-day work. Therefore, it was decided to have support from a small 'secretariat' to be placed at Aalborg University, Dept. of Production. In addition, each of the three work groups had an academic member from the Department. It was also decided to have a website, [www.byginord.dk](http://www.byginord.dk), for the initiative, open to the public. A PhD-student at the Department was appointed webmaster of the site. Thus, firm links to the Department were established early in the process.

At the same time it was suggested that NJ as a region had special qualifications regarding attitudes towards co-operation, values and other 'soft' aspects; aspects which would facilitate the process in the work groups and the foreseen learning. In order to verify that NJ had such qualifications compared to the rest of the country the Department of Business Studies, Aalborg University was contracted to carry out a comparative study.

Funding for the activities was provided by the actors themselves regarding spent time and transportation. Other costs were covered by *Fonden Realdania*, a Danish fund which supports activities of public interest within the built environment in Denmark.

#### **THE WORK GROUP ACTIVITIES**

The work groups were finally organized in accordance with the wishes of each individual. Two groups were rather small (Theme 1 and 3) while the Theme 2 work group was so large that the members found it necessary to split into several sub-groups with each their sub-theme. For some time the Theme 1 work group found it suitable to split geographically into three groups. The work groups commenced work by discussing the TOR which were paraphrased in order to make them operational guidelines for the work. No alteration of the content as such took place. During the period of half a year the work groups and the sub-groups had several meetings. All groups had thorough discussions about the construction process – almost all meetings had a ‘warming up’ phase with short discussions about the every day problems faced by the participants at their jobs, problems which were instinctively linked to the construction process and partly inspired by Lean Thinking. Several of the groups finally defined what they considered the ultimate construction process. This formed a basis for the generation of ideas in the groups. Some groups had focus on meeting the clients’ needs; other groups on cooperation between the different trades; yet other groups on strategic relationships; etc. Every group had its own focus depending of the interest of the participants in the group and with at least some loyalty to the TOR.

After 4½ months an internal seminar was held where all three work groups presented their work for discussion. This gave material for further activities in the work groups and after 1½ months the groups had to realize that Phase One was coming to an end and that their work had to be finally documented in working papers. Table 1 gives two examples of issues discussed and documented in the working papers.

Table 1: Issues Discussed and Documented in Working Papers - two examples.

**Visual Value Clarification**

It is often difficult for an inexperienced client to communicate her/his values to the architects and consultant engineers. Instead of discussing the client's values in words it was suggested to take pictures of values. The pictures could be taken as part of an excursion where the client, the users, the architects, the consultant engineer, and the contractors took pictures of good and bad values of a reference building. These pictures could afterwards be applied as a reference to the design of the building. Wandahl (2004) gives more details about this visual value clarification.

The work group visited a completed building and took pictures. At a later workshop each party presented their values with a short description of whether and why the pictures presented a good or a bad value.

**Creation of a Basis for Selection of the most Appropriate Client.**

The Act and the ministerial decree state that the bidders must submit as part of the bid a proposal for a 'model for co-operation' to be applied during the construction process. As it can be anticipated that inviting for tender on the role of the client will often be a one-by-one matter for the local governments it would be unfortunate if the local governments in their selection process should start from scratch every time. It would, therefore, be a great advantage if the contents of the material submitted by the bidders have a uniform structure. This would also be an advantage for the bidders who would know more precisely what the local governments are asking for.

As an alternative to simply asking the bidders to provide a description of a model for co-operation the work group has developed a record of 12 issues to be elaborated by the bidders and submitted to the local government as part of the bid. The basis for the record is the requirements of the Act combined with the experience/opinion of the group members being local government politicians and local authority employees, client advisors, architects, consultant engineers, and officials from associations for publicly subsidized housing projects.

**THE STUDY OF THE CONSTRUCTION SECTOR IN NORTH JUTLAND**

Department of Business Studies carried out the comparative study in November 2003. Contact was made to 634 companies within the construction industry. 441 (70 %) accepted to participate and were all interviewed by telephone based on a questionnaire. Table 2 gives the composition of the companies who participated.

Table 2: Number of Companies Included in the Study.

Type of company	No. (NJ)	No. (DK)	Total
Client organization	25	31	56
Contractor	88	86	174
Consultants	40	48	88
Suppliers	59	64	123
Total	212	229	441

Most questions were of the nature that gives the respondent the possibility to express her/his level of agreement to a statement. The results of the interviews were compiled in a report (Jysk Analyseinstitut A/S 2003) and a summary of the preliminary analysis was presented at

Conference Two (Vinding, 2003). It is the plan to further work on the results to prepare a more comprehensive report.

The overall conclusion regarding patterns and modes of co-operation is that there are no major deviations between NJ and the rest of Denmark. However,

- The co-operation climate in NJ is to a lesser extent dominated by a culture of conflicts, especially for consultants and suppliers.
- The amount of innovation is less, mainly because of lack of capital, and innovation is far less based on research and development in NJ. In addition, knowledge in general from research institutions, sector associations etc. is less utilised in NJ.

A few questions were posed with a possibility for 'open answers'. Although there are some focus areas in the answers they are widespread and unfortunately very brief. This leaves the analyst with an uncertainty in the interpretation of the answers. However, some of the answers will be referred to in the section 'The Approach Applied – Pros and Cons' later in this paper.

## **CONFERENCE TWO**

The objective of Conference Two was threefold: To present and discuss the results of the three work groups and the study of the construction sector in NJ; to look ahead towards Phase Two; and to maintain the interest to participate in the future work. Invitations were sent out to a narrower cohort of stakeholders this time and slightly more than 130 persons participated in the one-day conference which was held at Aalborg University. The presentations of the results of the work groups and the study were well received and caused some discussion.

In addition to the presentations speeches were given by representatives from Ministry of Economic and Business Affairs, The Benchmark Centre for the Danish Construction Sector, and the Danish Construction Association, commenting on the BYGiNORD activities seen in light of the present situation and the expected future development within the sector.

At the conference the general attitude towards BYGiNORD was very positive. However, scepticism was aired regarding the implementation of ideas generated in the work groups. Several participants hinted at the fact that the results of many previous initiatives, including establishment of networks, had never been implemented or they had not been properly rooted in the sector. A strong co-operation between the sector and research and training institutions was emphasized as a prerequisite for major changes in attitudes among the actors in the sector.

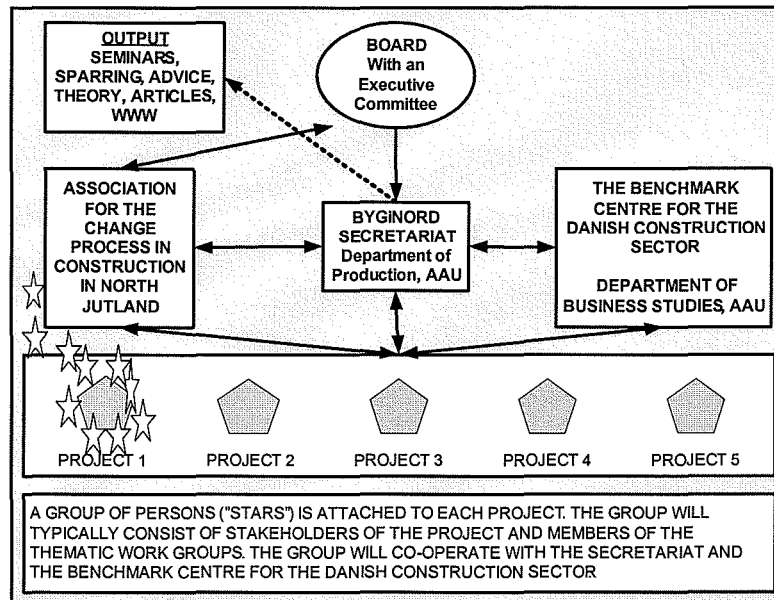


Figure 3: Outline for BYGiNORD Phase Two.

At the conference an outline for a new organization for the handling of future activities in BYGiNORD was presented (see figure 3). In order to create ownership to the activities it was proposed to form an Association for the Change Process in Construction in North Jutland. Table 3 shows the mission of the association.

Table 3. Mission of Association for the Change Process in Construction in North Jutland.

<p><b>Mission:</b></p> <ul style="list-style-type: none"> <li>• To further new modes of management and co-operation;</li> <li>• to test and evaluate new practical models;</li> <li>• to set focus on the users of buildings;</li> <li>• to create more value and higher quality;</li> <li>• to further a better and more agile construction process; and</li> <li>• to make buildings less expensive.</li> </ul> <p><b>The association will:</b></p> <ul style="list-style-type: none"> <li>• Facilitate the testing of new ideas and new initiatives on demonstration projects;</li> <li>• evaluate and disseminate results and experience gained; and</li> <li>• participate in partnership arrangements regarding development and evaluation.</li> </ul>
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As the main purpose of Phase Two is to test elements of ideas generated during Phase One six construction projects were presented. All clients had agreed to let the projects form a basis for testing of ideas, although the ideas to be tested had not yet been specified in detail. Thus, the point of departure for the testing will be projects – not companies.



## **PRODUCTS OF PHASE ONE**

In addition to the two conferences the visible product of Phase One is the white paper and working papers prepared by the work groups.

The original concept of a 'scouts manual' was abandoned and reserved for Phase Two for at least four reasons: The TOR of the work groups were broad; the time frame was narrow; it was difficult to get a good grip of the object of the work: The construction process, as it is very complex - by some considered on the verge of chaos (e.g., Bertelsen 2002); and initially the work group members had different but firm perceptions of the process. Consequently, the white paper ended up comprising:

### Part 1.

- A description of the BYGiNORD initiative and its process during Phase One;
- summarized results of the study of the construction sector in NJ; and
- a short description of the major research and development initiatives within the Danish construction sector since 1991.

### Part 2.

- The working papers prepared by the three work groups.

## **EVALUATION OF PHASE ONE**

The Steering Committee decided to have an evaluation of Phase One carried out and to collect views on the future of BYGiNORD (Phase Two). The secretariat submitted questionnaires to all members of the three work groups. All questions offered a possibility for the respondent to apply a set of formulated options for answering (in some of the questions the respondents could mark off two options) as well as to add comments regarding the subject of the question. Unfortunately, the response rate was on the lower side, only 37 %. Some argued that their participation in the work group activities made it impossible for them to answer the questions unbiased. Few comments were added to the questions.

In general the respondents expressed satisfaction with the course of Phase One. A few respondents felt that there had been some waste of time; this is possibly combined with the fact that several felt that the TOR had been rather loosely formulated. Others expressed that it had been a process with great creativity. 9 answered that they had preferred the work groups be managed more effectively while 5 persons would have preferred a more visible Steering Committee. 4 expressed that the support from the university should have been more while none was of the opinion that they could have been without university support. Only two out of 29 had not yet read any part of the White Paper (two months after Conference Two). None responded that they found the white paper irrelevant.

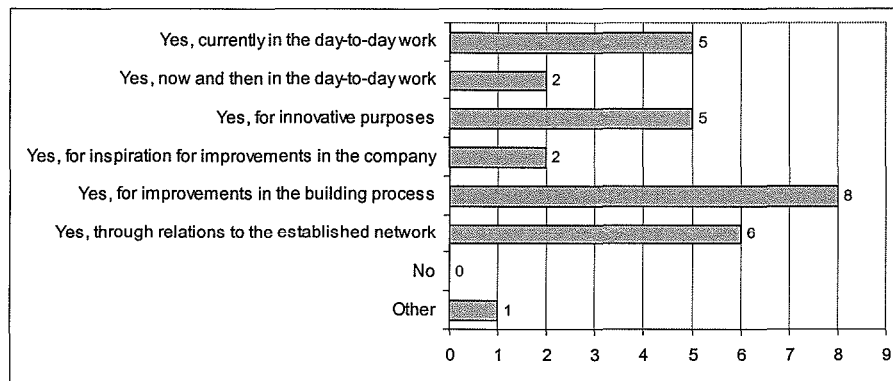


Figure 4: Response to the question: Do you expect to make use of the results documented in the White Paper or from future discussions in BYGiNORD?

Regarding the future the respondents were in general positive to the possibility for them to make use of the results documented in the white paper and the future discussions in Phase Two. Figure 4 shows the response.

The questionnaire also addressed the model for the future BYGiNORD. Figure 5 gives the opinion of the respondents. It is obvious that all respondents are in favour of a continuation of BYGiNORD in some way or another, not too far away from the model applied in Phase One.

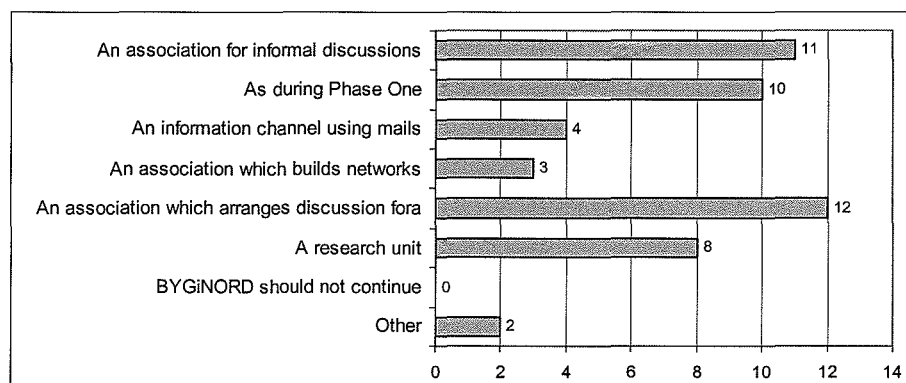


Figure 5: Response to the question: Do you take an interest in a continuation of BYGiNORD?

### PHASE ONE AND LEAN THINKING

The lodestar in Phase One has been to *minimise waste* in all aspects in the building process. The direct focus has been on how to secure an *optimal value for the client* and an appropriate organisational set-up. The work of Group One has encompassed the problem of identifying the most appropriate client and owner/administrator of public housing projects in order to maximise the *value for the users* of the housing facilities and to *minimise the resources spent* in the process. Work Group Two focused on organisational matters for example partnering and the clarification of the “softer” values for the client like aesthetics, and the third work

group discussed more strategic organisational matters. The work of the last two groups had clear references to for example the *Last Planner System* and *the Seven Streams*.

Thus, the activities in the work groups gave the participants an opportunity to linking more theoretical elements of Lean Thinking and Lean Construction to their daily work and their practical experience.

## **PREPARATION FOR PHASE TWO**

Shortly after Conference Two the Steering Committee held its final meeting in which the Phase One process was briefly evaluated and a preliminary board and an executive committee for the new association were appointed. It was also decided to carry out the evaluation of Phase One as described above. The first task of the board is to draw a set of articles of the association. In parallel herewith contacts are maintained to the six construction projects and to relevant sources of funding for future activities.

## **THE APPROACH APPLIED - PROS AND CONS**

The initiative taken is the first of its kind in Denmark. Therefore, it has good meaning to discuss the approach and possibly propose recommendations for adjustments in Phase Two and in case of repetition in other areas. The discussion falls in four sections: The construction industry culture; the idea of regional learning as a basis of the approach; action learning as a learning methodology during the course of the initiative; and organisation.

## **CONSTRUCTION INDUSTRY CULTURE**

Kuada and Gullestrup (1997) describe industry culture in this way:

“Industry culture may be seen as the dominant perceptions that are shared by most of the companies of the industry at a given time and enable the industry to function properly. At any given point of time in an industry's history there exists a set of unarticulated and semi-articulated constellation of forces (e.g. tacit practices, assumptions, habits and prejudices) that shape decisions within it as well as its development in general. These forces frequently override the prescriptions of rational economic calculations. This system of shared perceptions is assimilated to the point where it is often applied unconsciously and tends to produce standard behaviour patterns among the members of the industry at various levels of interaction”.

The above combined with the fact that parts of the construction industry in Denmark are regarded very conservative (BEC 2003) and that the construction industry is considered one of the most tradition bound industries in general, it may seem optimistic to believe that the initiative could cause a generation of new ideas and an eagerness for trying out the ideas.

However, it turned out that the attitude of the persons in the work groups was characterized by high motivation; openness; willingness to formulate new ideas regarding the construction process; and eagerness for making them operational and for trying them out. In other words: They seem to have left their industry culture at home. There are signs at present that the Danish Construction Sector is becoming more dynamic and some members of the work groups express that this has encouraged them to actively participate in BYGiNORD.

However, the process chosen by the initiative seems to have facilitated their activities – the more modest would say that it has not been a barrier to the activities.

### **LEARNING REGION**

The regional focus may give extra opportunities for learning and innovation. Literature has previously discussed this under the heading “Regional Learning” (Asheim 2001). Learning regions function as “collectors and repositories of knowledge and ideas and provide an underlying environment or infrastructure which facilitates the flow of knowledge, ideas and learning” (Florida 1995, p.527). Another issue is trust. “This issue refers to the willingness of one party to relate with another in the beliefs that common trust in a collaborative action will be beneficial rather than detrimental to each partner” (Lindgren and Gudmundsson 2003). A case study made on furniture manufacturers in Salling, a region just west of NJ, (Lorenzen 1998) reveals that “further, even entrepreneurs that are competing on products consider themselves as colleagues rather than competitors” and that “even non-locals (non-members of the guild) may be trusted, if they have ‘the right chemistry’.”

The construction sector in Denmark is characterised by a few larger and a large number of smaller companies. The larger ones have regional offices with a high level of autonomy. Thus, a regional focus is pertinent for all actors: Clients, consultants and contractors and a regional approach to learning is obvious. The *evaluation* of Phase One clearly supports the establishment of a regional association and networking. However, the more spontaneous, ‘open answers’ in the *study* of the construction sector in NJ, only in a few cases mention networking and a wish for regional innovation activities is not mentioned at all.

Regarding trust the ‘open answers’ frequently mention: Openness, co-operation, experience exchange groups, and similar, pointing into the direction that trust can be developed over time. Along this line Phase One showed open discussions in the work groups irrespective of the composition (clients, contractors, consultants, etc) of the groups. This may have been supported by the fact that many of the work group members already knew each other when BYGiNORD commenced its activities, and that the ‘chemistry’ of the members was well known when the work groups were formed.

In combination with the need to keep transportation time at a minimum the above indicates that NJ can act as a learning region within the construction sector in the future.

### **ACTON LEARNING**

The participants in the work groups all play managing roles in their day-to-day work, so they were busy persons – either because the economic activity in their organisations was high – or because it was low, necessitating strong acquisition activities. In addition, they are daily ‘trouble shooters’. Therefore, it will be difficult for such personnel to follow longer lasting courses at universities or other institutional programmes.

The approach to take the point of departure in actual projects looks promising and it has been proposed by some work group members. The phase of problem identification and formulation, based on previous experience and the opportunities which the project offers, may be facilitated by the mode of work in Phase One. As six projects have been proposed there

should be so many problem areas to study that the work groups in Phase Two will be of limited size, maybe only three to five persons, built on a basis of trust, 'chemistry', and interest.

The above seems to support Action Learning which has been applied with success in the sector for example in the UK as described in (Powell 1999). "One of the concepts behind action learning is that the best way to learn is by trying out ideas in real life situations and learning from one's own experience and experiences of others one trusts".

## **ORGANISATION**

The proposed organisation for Phase Two has not been questioned although it has been given considerable attention. The importance of ownership to such initiatives has been described in (Lindgren and Gudmundsson 2003) based on a case study of an inter-company knowledge development collaboration project which failed. The association could be an answer to the ownership issue and the executive committee and the secretariat to the issue of keeping momentum in the process. After Conference Two has followed a period with low visible momentum because of the evaluation of Phase One, the establishment of the board and the executive committee and formulation of articles for the association. In addition, funding has not yet been secured for the secretariat. The momentum will have to be increased shortly to maintain the interest of the stakeholders.

The university as a learning and research institution is mentioned only once in the more than 700 'open answers'. However, it is foreseen to play a major role as a facilitator through the secretariat. In addition, the research world is anticipated to be activated for facilitation of advice, monitoring and knowledge management (extended learning bank) as experienced in the UK (Powell 1999). The ideas tested in the projects will form basis for conference papers, journal articles, and adjustments to MSc programmes in engineering. Aalborg University has a member on the board and the executive committee and the secretariat will be established at the university. Thus, firm links between the future BYGiNORD and the university are in place.

## **CONCLUSION**

The BYGiNORD initiative has been planned and evaluated with the view to developing into a continuous undertaking in order to improve the efficiency and effectiveness of the construction sector. This paper has given a description of the process of the initiative which has been assessed to be a success so far. The initiative has managed to keep momentum for more than half a year and is entering a critical phase of transition into a Phase Two with new types of activities and an altered organisational set-up.

A foundation for the process in Phase Two has been laid. An appropriate organisation which can take ownership for the activities and show commitment has been agreed upon and is in the process of being established. The culture of the construction sector in NJ is not a specific barrier for the area to act as a learning region, and the mode of learning, action learning, will be applied in accordance with a proposal from the actors themselves.

The crucial questions for the future course of the BYGiNORD initiative are now:

- Will it succeed in regaining momentum so fast that the activated hidden resources, out of whom some already have plans for their future learning activities,

will feel supported by BYGiNORD and thus maintain their interest and stay unhidden?

- Will the actors be able to maintain their independence from the culture of the construction industry or will their day-to-day endeavours leave little room for manoeuvring and make them return to traditional thinking?
- Will it be possible based on a mutual interest to further develop working relations between the construction industry in NJ and Aalborg University, in spite of the fact that hitherto it has been unusual for the construction industry in NJ to utilize university links in its efforts to develop itself?

## REFERENCES

- Asheim (2001). "Learning Regions as Development Coalitions: Partnerships as Governance in European Workfare States?" *Concepts and Transformation. International Journal of Action Research and Organizational Renewal*, 6, 73-101, 2001.
- BEC (2003). Homepage of the National Benchmark centre of the Danish Construction Industry. [www.byggeevaluering.dk](http://www.byggeevaluering.dk)
- Bertelsen, S. (2002); "Bridging the Gaps – Towards a Comprehensive Understanding of Lean Construction". *Proceedings of the 10<sup>th</sup> annual conference of the International Group for Lean Construction*, Gramado, Brazil.
- BYGiNORD (2003). "Udkast til hvidbog" (in Danish only). English translation of title: "White Paper"
- DK (2003). The State Government as the Client. Ministry of Economic and Business Affairs, August 2003 (in Danish).
- Jysk Analyseinstitut A/S (2003). "Nordjysk Byggetradition 2003" (in Danish only). English translation of title: Construction Tradition in North Jutland 2003. Tables and Open Answers from the study of the construction sector in North Jutland, 2003.
- Kuada, J. Gullestrup, H (1997). "Cultural Categories and Profiles. A Framework for Studying Individuals' Behavior in Organizations". *International Business Economics. Working Paper Series, no. 24 p. 16, Centre for International Studies, Aalborg University*. (Available at <http://www.business.aau.dk/ivo/publications/working/wp24.pdf>)
- Lindgren, P and Gudmundsson, A (2003). "Ownership and Collaborative Product Development". *Proceedings of the EurOMA/POMS Joint International Conference "One World? One View of OM?"* in Cernobbio Como, Italy.
- Lorenzen, M. (1998). "Information cost, learning, and trust. Lessons from co-operation and higher-order capabilities amongst geographically proximate firms". 2<sup>nd</sup>. Draft. Prepared for the DRUID Summer Conference, Bornholm, Denmark 1998. (Available at <http://www.druid.dk/conferences/summer1998/conf-papers/lorenzen.pdf>)
- OECD (2002). OECD. STAN Database, OECD Labour Force Statistics 1981-2001. OECD Employment Outlook 2002.
- Powell, J. (1999). "Action Learning for Continuous Improvement and Enhanced Innovation in Construction". *Proceedings of the 7<sup>th</sup> annual conference of the International Group for Lean Construction*, University of California, Berkeley, California, USA.

- Vinding (2003). "En særlig Nordjysk byggesektor – Er vi så gode til netværk som vi tror?" (in Danish only). English translation of title: "A Special Construction Sector in North Jutland - Are we as good at Networking as we Believe?" Presentation of Study Results at Conference Two, November 2003.
- Wandahl, S. (2004). "Value Carriers in a Construction Project – How Different are they?" *The paper has been submitted for the 12<sup>th</sup> annual conference of the International Group for Lean Construction, Elsinore, Denmark.*